THE POWER OF A STRONG FOUNDATION

Annual Report **2022**

The Hanover Insurance Group®

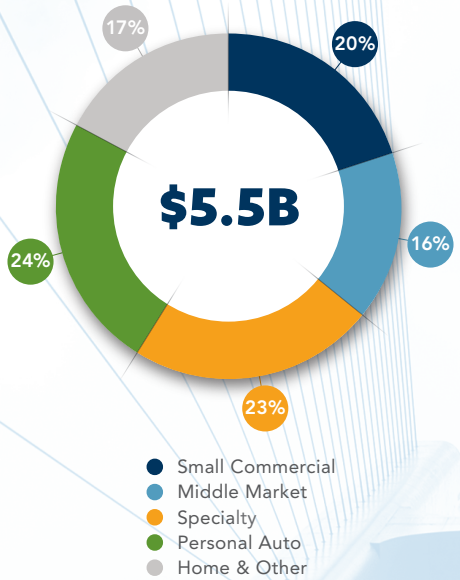
FINANCIAL HIGHLIGHTS

YEARS ENDED DECEMBER 31 *($ in millions, except per share amounts)*	2021	2022
Revenues	$5,228	$5,469
Net Income	$419	$116
Operating Income after Income Taxes[1]	$318	$200
Total Assets	$14,254	$13,997
Shareholders' Equity	$3,145	$2,326
Shareholders' Equity, Excluding Net Unrealized Appreciation or Depreciation on Fixed Maturity Investments, Net of Tax[2]	$2,960	$2,967
PER SHARE DATA		
Net Income per Diluted Share	$11.49	$3.21
Operating Income per Diluted Share[1]	$8.73	$5.53
Book Value per Share	$88.59	$65.38
Book Value per Share, Excluding Net Unrealized Appreciation or Depreciation on Fixed Maturity Investments, Net of Tax[3]	$83.38	$83.41

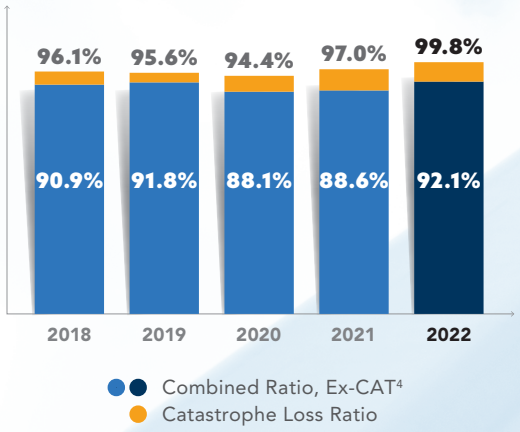
1 Operating income after income taxes, operating income after income taxes per diluted share, shareholders' equity, excluding net unrealized appreciation or depreciation on fixed maturity investments, net of tax, book value per share, excluding net unrealized appreciation or depreciation on fixed maturity investments, net of tax, combined ratio, excluding catastrophes, and expense ratio are non-GAAP measures. The definitions and reconciliations to the most directly comparable GAAP measures can be found in the endnotes. Please reference the endnotes on the final pages of this document for the definitions and reconciliations of these and other non-GAAP measures used through this report.

INSURANCE BUSINESS MIX

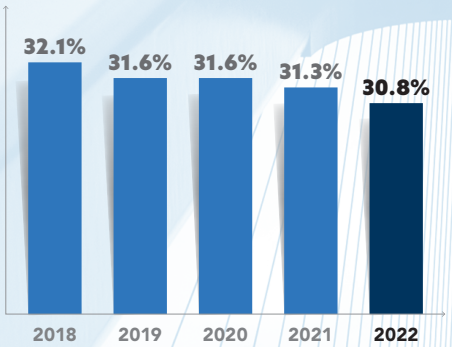
2022 Net Premiums Written



COMBINED RATIO



EXPENSE RATIO[5]



To Our Shareholders,

Our company made important strides in 2022, as we strengthened our competitive position, accelerated our growth momentum, advanced our unique culture, and executed on our winning strategy. I take great pride in all that our team accomplished during the year and am more confident than ever we have what it takes to succeed over the long term, delivering for our shareholders and all of our stakeholders.

2022 was an extraordinarily dynamic year that created both challenges and opportunities, requiring agility and new ways to assess and react to emerging trends. Turbulent financial markets, geopolitical instability, substantial inflation, and a dynamic and competitive employment market tested our industry like never before.

JOHN C. ROCHE
President and Chief Executive Officer

At the same time, changing weather patterns underscored the need for our company and our peers to adjust exposure and financial management strategies in order to provide innovative and responsive solutions to our agent partners and customers and drive sustainable, profitable growth going forward.

We persevered through this adversity, continuing to leverage the power of the strong foundation we have established—building on our rigorous financial and underwriting discipline, diversified business mix, powerful agency distribution approach, the investments we have made in innovation, and our unique culture. Our resilience in 2022, especially in the face of unprecedented macro and industry challenges, is further evidence we are making significant progress on our journey to be the premier property and casualty franchise in the independent agency channel.

BUILDING ON THE STRENGTH OF OUR FINANCIAL TRACK RECORD

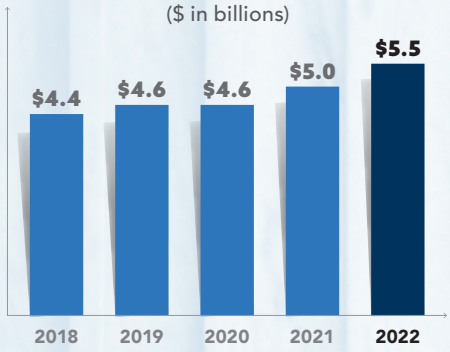
For the year, we generated operating income per share of $5.53 and an operating return on equity[6] of 6.7%, reflecting the impact of the inflationary economic environment and elevated catastrophe activity, primarily in the fourth quarter. On the year, we delivered a combined ratio of 99.8%, and a combined ratio, excluding catastrophes, of 92.1%, as we continued to demonstrate our expense rigor, achieving a 50-basis point improvement in our expense ratio from the prior year, driven primarily by growth leverage. At the same time, we increased net premiums written by 9.7%, to $5.5 billion, with strong contributions across all segments.

Inflation proved to be a significant challenge for us and the industry in 2022. Our team responded quickly, implementing a three-pronged margin recapture plan focused on enhanced pricing, insurance-to-value adjustments, and targeted underwriting measures. We are very pleased with the significant progress made on these initiatives across our major lines of business, particularly in the second half of 2022. We expect the benefit from these actions to start materializing in 2023 as we continue to pursue rate and exposure increases, and leverage our strong market position.

We remain committed to delivering long-term shareholder value through our well-established approach to capital allocation and management, as we thoughtfully balance the most effective and advantageous capital uses in the current environment. In 2022, we returned $140 million to our shareholders through dividends and share repurchases. We also increased our quarterly dividend by 8% in December, underscoring the effectiveness of our differentiated strategy and reaffirming our board's confidence in the long-term earnings potential of our business. We continue to prioritize capital allocation to our higher-margin businesses to support and drive organic growth, while at the same time remaining focused on CAT risk management. In 2022, we sponsored our first-ever catastrophe bond, securing $150 million in occurrence coverage for named storm events in the Northeast for a three-year period.

NET PREMIUMS WRITTEN

($ in billions)

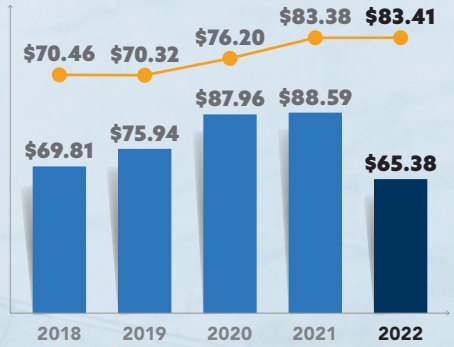


ORDINARY DIVIDENDS PER COMMON SHARE*

* The company declared special dividends of $4.75 per common share on December 30, 2018, and $2.50 per common share on December 5, 2019, as a result of the sale of the company's Chaucer business.

For more information, please see section "Dividends" in Part II — Item 5 of the company's Annual Report on Form 10-K for the year ended December 31, 2022.

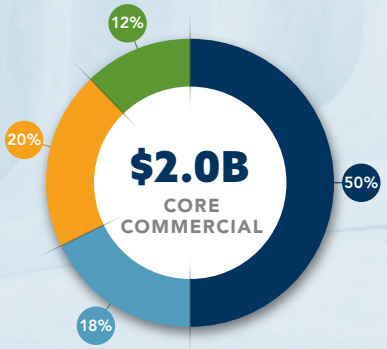
BOOK VALUE PER SHARE



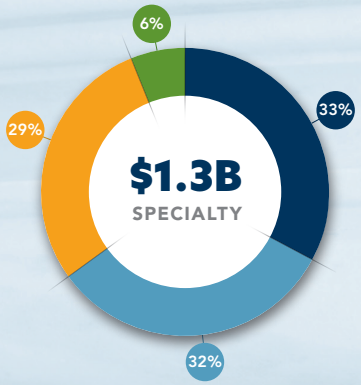
Book Value per Share, as Reported
Book Value per Share, Excluding Net Unrealized Appreciation or Depreciation on Fixed Maturity Investments, Net of Tax[3]

* The definitions and reconciliations to the most directly comparable GAAP measures can be found in the endnotes. Please reference the endnotes on the final pages of this document for the definitions and reconciliations of this and other non-GAAP measures used through this report.

INSURANCE PRODUCT MIX — 2022 NET PREMIUMS WRITTEN



- Commercial Multiple Peril
- Commercial Auto
- Workers' Compensation
- Other Core Commercial



- Professional and Executive Lines
- Specialty Property and Casualty
- Marine
- Surety and Other

- Personal Auto
- Home and Other

BENEFITING FROM INCREASED DIVERSIFICATION

Over the past 10 years, we meaningfully transformed our company. Today, our business is much more diversified by geography, line of business, and product mix. As a result, we are able to absorb changes in loss trends, adjust effectively to emerging business risks, and manage our growth more profitably.

We also have focused on reducing our exposure to natural catastrophes in challenging geographic locations, including but not limited to coastal areas. The benefit of this work has been apparent in recent years. It is reflected by the lower levels of our hurricane and wildfire losses compared to our market share over the last five years, including in 2022, when Hurricane Ian hit the Southeastern U.S.

Changing weather patterns, more frequent storms and more extreme weather events, like Winter Storm Elliott in late December of 2022, require a new approach, with greater focus on pricing and risk prevention. We have managed our CAT risks well in recent years, employing disciplined underwriting strategies augmented by data, analytical tools, and technology. We're confident our focus on risk selection, pricing, and the use of innovative tools will enable us to effectively address these newer weather patterns as we help drive our industry toward a "predict and prevent" approach to risk management rather than the traditional "repair and replace" approach. Winter Storm Elliot will provide an important catalyst, we believe, for the greater adoption of sensor technology and other water and freeze loss prevention approaches.

EXPANDING OUR ATTRACTIVE SPECIALTY PORTFOLIO

We continued to expand our most profitable businesses in 2022, and in particular, our Specialty business, taking this segment to a new level. The strong growth of our Specialty business enables us to offer one of the broadest product portfolios in the market while effectively spreading our risks by product line. We have more than doubled the size of this business since 2010, to $1.3 billion in net premiums written. This growth is an outcome of strategic acquisitions made in prior years as well as organic initiatives.

In 2022, our Specialty business generated growth of 11.2%, building on its strong market position and delivering above-average returns. At the same time, this business delivered enhanced profitability, and generated a sub-90s combined ratio, demonstrating the strength of our offering, our agency partnership model, and our ability to access high-margin Specialty business.

TAKING OUR AGENCY PARTNERSHIP APPROACH TO THE NEXT LEVEL

We continued to strengthen our unmatched distribution capability in 2022 as well, adding value to our mutually beneficial agency relationships and gaining market share with our best agency partners.

Our distribution capability represents a valuable competitive advantage. We made important strides in advancing our independent agency relationships during 2022, helping many agents better serve their customers in the midst of continuing agency consolidations and a challenging employment market. Agency consolidation trends continue to provide a tailwind for us, as agents seek to capture the embedded value of past mergers and acquisitions, take advantage of operating efficiencies, redistribute their books of business among fewer carriers, and deliver enhanced customer service.

By leveraging our experienced field teams in local markets, offering high-quality products and services, and bringing proprietary data and analytics capabilities to the table, we helped our agency partners effectively manage challenging market conditions and achieve their goals during the year. These relationships proved critical as we implemented rate increases throughout 2022 and worked together to educate customers on the drivers of rising insurance costs.

In addition, we selectively added agents in new and under-penetrated markets, extending our reach and further diversifying our business, making 290 new agency appointments, enhancing our access to personal lines, small commercial, and specialty niche markets.

ADVANCING OUR TECHNOLOGY AND UNDERWRITING CAPABILITIES

We have made significant investments in technology, data, analytics and innovative underwriting capabilities over the last decade. The data and analytical capabilities we have developed served us extremely well in 2022.

These capabilities provide enhanced underwriting analysis, greater use of third-party data, and integration with leading agency management systems, as well as superior decision-making and agile changes in rating structures for specific states and risks. Our investments also enabled us to enhance self-service offerings for our agents and customers, provide our partners with valuable market insight, and grow more profitably. Our enhanced customer service and claims platforms, for example, have improved customer experience and provided valuable data for us to manage our portfolio of risk more proactively across our businesses.

The addition of these capabilities in 2022 also enabled our company and our agent partners to compete more effectively. At the same time, we maintained our intent focus on the future, making longer-term investments to position our company for what's ahead. As we look to improve the overall efficiency of data exchanged between our agents, customers and underwriters, we will continue to enhance our integration with several of the top agency management systems to make it even easier for our agents to serve our customers faster, more effectively and more efficiently.

ENHANCING OUR UNIQUE CULTURE AND LONG-TERM SUSTAINABILITY

The great work we do and our ongoing success would not be possible without the dedicated efforts of our talented team and our collaborative and increasingly inclusive culture.

Our company values are at the core of all we do. Our CARE values help us maintain a work environment that fosters Collaboration, Accountability, Respect and Empowerment. And, our employee value proposition reflects the essence of what our company offers our employees: a sense of pride, the ability to grow a rewarding career, to feel respected, and to experience our one-of-a-kind culture.

Furthermore, we made meaningful strides in our journey to be a more inclusive and diverse organization. A copy of our latest inclusion, diversity and equity report is available on www.hanover.com. We have further invested in the ongoing development of multiple employee-led business resource groups (BRGs). These BRGs support employees from underrepresented populations and their allies.

In 2022, we also established a fund to enable our BRGs to host internal events and outside speakers, provide financial support to relevant community projects, and to secure additional educational resources. These efforts have helped us retain the talented team and attract new talent and expertise across our organization that is required to drive sustainable, profitable growth going forward.

DRIVING POSITIVE CHANGE

We are more committed than ever to maintain our promise to be a socially responsible organization, governing our actions with integrity and honesty, making a difference in our local communities, and protecting the environment.

We doubled down on our commitment to help build strong, vibrant communities, enabling and supporting employee volunteerism while making charitable contributions that respond to a wide range of needs.

In 2022, together with over 80% participation from our employees, we donated nearly $1.5 million to the United Way and hundreds of local nonprofit organizations around the country. We also made numerous contributions through our charitable foundation, providing support for public education, after-school and summer programs, shelters and food pantries, family health and safety, and disaster relief through the American Red Cross.

Our efforts to be an employer of choice and a responsible corporate citizen continue to be widely recognized. Over the past year, our company was named one of Newsweek's Most Responsible Companies, a Forbes' Best Midsize Employer, one of JUST Capital's top 125 public companies, a Human Rights Campaign's Best Place to Work for LGBTQ+ Equality, and one of Fairygodboss' Best Companies for Women and Best Companies Where CEOs Support Gender Diversity.

As I write this letter, we are preparing to publish our inaugural sustainability report. This report highlights the progress we have made to develop and support important environmental, social and governance endeavors for our company. We also established a new, employee-led Green Team to help educate and engage our stakeholders about the importance of sustainability, both for our company and for the community.

I am incredibly proud of the team we have assembled at The Hanover and I appreciate the tremendous effort our employees make every day to help our customers, friends and neighbors in need through our business and in local communities. Whether through our efforts to reduce our carbon footprint and improve our utilization of green technology, our vibrant employee volunteerism, or our commitment to support community building, we are focused on making a difference in the communities where our employees live and work.

DELIVERING TODAY, TRANSFORMING FOR TOMORROW

Today, we are positioned to deliver strong returns and take advantage of the opportunities that arise in these dynamic times, leveraging our proven strategy, deep expertise, superior distribution model and unique culture. And, we are committed to delivering consistent, top-quartile performance over time.

As we look ahead, we fully expect the pace of change will continue to accelerate. We have a deliberate, long-term strategic approach based on scenario planning that will enable us to remain intently focused on the current environment and ensure we are meeting the needs of our key constituents today, while also enabling us to make bold decisions about our future, addressing trends that could impact our company and the industry over the long term. This approach allows us to effectively manage current market conditions and trends while anticipating the market of the future.

Most importantly, we are working from a position of strength, leveraging the power of our strong foundation, and we have confidence we will continue to deliver on our promises to our policyholders, agents, shareholders, employees and communities.

Sincerely,

JOHN C. ROCHE
President and Chief Executive Officer

The Partner Group

JOHN C. ROCHE
President and Chief Executive Officer

JEFFREY M. FARBER
Executive Vice President,
Chief Financial Officer

DENNIS F. KERRIGAN
Executive Vice President,
General Counsel

RICHARD W. LAVEY
Executive Vice President,
President, Hanover Agency Markets

WILLARD T. LEE
Executive Vice President,
Chief Information and Innovation Officer

DAVID J. LOVELY
Executive Vice President,
Chief Claims Officer

DENISE M. LOWSLEY
Executive Vice President,
Chief Human Resources Officer

BRYAN J. SALVATORE
Executive Vice President,
President, Specialty

Board of Directors

(A) AUDIT COMMITTEE | (C) COMPENSATION AND HUMAN CAPITAL COMMITTEE | (N) NOMINATING AND CORPORATE GOVERNANCE COMMITTEE

CYNTHIA L. EGAN (C)
Chair of the Board,
The Hanover Insurance Group, Inc.;
Retired President,
Retirement Plan Services,
T. Rowe Price Group

FRANCISCO A. ARISTEGUIETA (C)
Special Advisor to State Street Corporation

KEVIN J. BRADICICH (N)
Senior Partner Emeritus,
McKinsey & Company

THEODORE H. BUNTING, JR. (A)
Retired Group President,
Utility Operations,
Entergy Corporation

JANE D. CARLIN (A)*
Retired Managing Director and
Global Head of Operational
Risk Management,
Morgan Stanley Group Inc.

J. PAUL CONDRIN III (C)*
Retired President, Commercial Insurance,
Liberty Mutual Group

MARTIN P. HUGHES (A)
Chair of the Board of Directors,
HUB International Limited

WENDELL J. KNOX (C)**
Retired President and
Chief Executive Officer,
Abt Associates Inc.

KATHLEEN S. LANE (N)
Retired Executive Vice President and
Chief Information Officer,
The TJX Companies, Inc.

JOSEPH R. RAMRATH (N)*
Senior Managing Director,
Colchester Partners LLC

JOHN C. ROCHE
President and Chief Executive Officer,
The Hanover Insurance Group, Inc.

HARRIETT 'TEE' TAGGART (A)**
Retired Partner, Senior Vice President,
Wellington Management LLC

ELIZABETH A. WARD (A)
Chief Financial Officer,
Massachusetts Mutual Life Insurance
Company

* Committee Chair
** Mr. Knox and Ms. Taggart have reached the mandatory retirement age under the Company's director retirement policy and will retire from the Board effective following the 2023 Annual Meeting of Shareholders.

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K

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

For the fiscal year ended December 31, 2022

OR

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

For the transition period from: _____ to _____

Commission file number: 1-13754

THE HANOVER INSURANCE GROUP, INC.
(Exact name of registrant as specified in its charter)

Delaware	04-3263626
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)

440 Lincoln Street, Worcester, Massachusetts 01653
(Address of principal executive offices) (Zip Code)

(508) 855-1000
(Registrant's telephone number, including area code)

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

Title of each class	Trading Symbol	Name of each exchange on which registered
Common Stock, $.01 par value	THG	New York Stock Exchange
7 5/8% Senior Debentures due 2025	THG	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 during the preceding 12 months. Yes ☒ No ☐

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

Large accelerated filer	☒	Accelerated filer	☐
Non-accelerated filer	☐	Smaller reporting company	☐
		Emerging growth company	☐

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

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

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

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

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

Based on the closing sales price of June 30, 2022, the aggregate market value of the voting and non-voting common stock held by non-affiliates of the registrant was $5,167,007,381.

The number of shares outstanding of the registrant's common stock, $0.01 par value, was 35,604,942 shares as of February 21, 2023.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of The Hanover Insurance Group, Inc.'s Proxy Statement to be filed pursuant to Regulation 14A relating to the 2023 Annual Meeting of Shareholders to be held May 9, 2023 are incorporated by reference in Part III.

THE HANOVER INSURANCE GROUP, INC.
ANNUAL REPORT ON FORM 10-K
FOR THE FISCAL YEAR ENDED DECEMBER 31, 2022
TABLE OF CONTENTS

Item	Description	Page
Part I		
1	Business	3
1A	Risk Factors	18
1B	Unresolved Staff Comments	33
2	Properties	33
3	Legal Proceedings	33
4	Mine Safety Disclosures	33
Part II		
5	Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities	34
6	Reserved	34
7	Management's Discussion and Analysis of Financial Condition and Results of Operations	35
7A	Quantitative and Qualitative Disclosures About Market Risk	66
8	Financial Statements and Supplementary Data	67
9	Changes in and Disagreements with Accountants on Accounting and Financial Disclosure	111
9A	Controls and Procedures	111
9B	Other Information	111
9C	Disclosures Regarding Foreign Jurisdictions That Prevent Inspections	111
Part III		
10	Directors, Executive Officers and Corporate Governance	112
11	Executive Compensation	114
12	Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters	114
13	Certain Relationships and Related Transactions, and Director Independence	114
14	Principal Accounting Fees and Services	114
Part IV		
15	Exhibits, Financial Statement Schedules	115
	Exhibits Index	116
16	Form 10-K Summary	120
	Signatures	120

PART I

ITEM 1 — BUSINESS

ORGANIZATION

The Hanover Insurance Group, Inc. (“THG”) is a holding company organized as a Delaware corporation in 1995. We trace our roots to as early as 1852, when The Hanover Fire Insurance Company was founded. Our primary business operations are property and casualty insurance products and services. We market our products and services through independent agents and brokers in the United States (“U.S.”). Our consolidated financial statements include the accounts of THG; The Hanover Insurance Company (“Hanover Insurance”) and Citizens Insurance Company of America (“Citizens”), which are our principal property and casualty subsidiaries; and other insurance and non-insurance subsidiaries. Our results of operations also include the results of our discontinued operations, consisting primarily of our former accident and health insurance business.

INFORMATION ABOUT OPERATING SEGMENTS

GENERAL

We conduct our business operations through four operating segments: Core Commercial, Specialty, Personal Lines and Other. Interest expense related to our corporate debt is reported separately from the earnings of these operating segments. In our Core Commercial, Specialty and Personal Lines segments, we underwrite our insurance products through Hanover Insurance, Citizens and other THG subsidiaries. We distribute them through select independent agents and brokers throughout the U.S. Our Other segment is comprised primarily of business from Opus Investment Management, Inc. ("Opus") and earnings and expenses related to our holding company. During the first quarter of 2022, we disaggregated our former Commercial Lines segment into Core Commercial and Specialty segments. Prior periods reflect this new presentation. This presentation is consistent with the manner in which our chief operating decision maker evaluates results in deciding how to allocate resources and in assessing performance.

Our agency and customer-centric strategy focuses on providing specialized insurance products and services with an emphasis on disciplined underwriting and pricing, quality claims handling and customer service. We continue to prudently grow and diversify our product offerings and geographic business mix to strengthen our position as one of the top property and casualty insurers focused on the independent agency distribution channel in the U.S. In 2022, we generated approximately $5.5 billion in net premiums written, an increase of 9.7% from the prior year.

Information with respect to each of our segments is included in "Results of Operations - Segments" in Management's Discussion and Analysis of Financial Condition and Results of Operations ("Management's Discussion and Analysis") and in Note 12 - "Segment Information" in the Notes to Consolidated Financial Statements.

RISKS

The industry’s and our profitability are significantly affected by numerous factors, including price; competition; volatile and unpredictable developments, such as weather conditions, catastrophes and other disasters; legal and regulatory developments affecting pricing, underwriting, policy coverage and other aspects of doing business, as well as insurer and insureds’ liability; extra-contractual liability; attorney involvement in claims matters; size of jury awards; civil unrest; acts of terrorism; fluctuations in interest rates and the value of investments; and other general economic conditions and trends, such as potential recessionary pressures and inflationary pressure or unemployment, that may affect the adequacy of reserves or the demand for insurance products. Our investment portfolio and its future returns are impacted by the capital markets and current economic conditions, which affect our liquidity, realized losses and impairments, credit default levels, our ability to hold such investments until recovery and other factors. Additionally, the economic conditions in geographic locations where we conduct business, especially those locations where our business is concentrated, affect the growth and profitability of our business. The regulatory environments in those locations, including any pricing, underwriting or product controls, shared market mechanisms or mandatory pooling arrangements, and other conditions, such as our agency relationships, affect the growth and profitability of our business. Our loss and loss adjustment expense (“LAE”) reserves are based on estimates, principally involving case assessments and actuarial projections, at a given time, of what we expect the ultimate settlement and administration of claims will cost based on facts and circumstances then known, predictions of future events, estimates of future trends in claims frequency and severity and judicial theories of liability, costs of repairs and replacement, legislative activity and other factors. We regularly reassess our estimate of loss reserves and LAE, both for current and past years, and resulting changes have and will affect our reported profitability and financial position.

Persistent supply chain disruptions emerging from the COVID-19 pandemic (“Pandemic”) and significant inflation in the U.S. economy, along with other factors outside our control, have resulted in higher claims costs, particularly in our automobile and homeowners lines of business. Additionally, several other Pandemic uncertainties persist, including evolving driving patterns and court caseload backlogs. The severity, duration and long-term effects of such uncertainties described above may, however, affect the property and casualty insurance industry, our business, and our financial results over the intermediate and long-term.

Reference is also made to “Risk Factors” in Part I – Item 1A.

LINES OF BUSINESS

Core Commercial

Our Core Commercial segment generated $2.1 billion, or 37.5%, of consolidated operating revenues and $2.0 billion, or 36.5%, of net premiums written, for the year ended December 31, 2022.

The following table provides net premiums written by line of business for our Core Commercial segment.

YEAR ENDED DECEMBER 31, 2022	Net Premiums Written	% of Total
(in millions, except ratios)		
Commercial multiple peril	$ 1,011.5	50.6%
Workers' compensation	394.8	19.7
Commercial automobile	353.1	17.7
Other core commercial	240.5	12.0
Total	$ 1,999.9	100.0%

We divide Core Commercial into two distinct businesses, small commercial and middle market, both of which focus on account business.

Our Core Commercial product suite provides agents and customers with products designed for small and mid-sized businesses. Small commercial offerings, which generally include annual premiums of $50,000 or less, deliver value through product expertise, local presence and ease of doing business. Middle market accounts, with annual premiums generally in the range of $50,000 to $500,000, require greater underwriting and claim expertise, as well as a focus on industry segments.

Core Commercial coverages include:

Commercial multiple peril coverage insures businesses against third-party general liability from accidents occurring on their premises or arising out of their operations, such as injuries sustained from products sold. It also insures business property for damage, such as that caused by fire, wind, hail, water damage (which may include flood), theft and vandalism.

Workers' compensation coverage insures employers against employee medical and indemnity claims resulting from injuries related to work. Workers' compensation policies are often written in conjunction with other commercial policies.

Commercial automobile coverage insures businesses against losses incurred from personal bodily injury, bodily injury to third parties, property damage to an insured's vehicle and property damage to other vehicles and property. Commercial automobile policies are often written in conjunction with other commercial policies.

Other core commercial coverage includes monoline general liability, commercial umbrella and monoline property.

Our strategy in Core Commercial is focused on strengthening and expanding our market reach through differentiated product offerings, industry segmentation, and franchise value through selective distribution. We continue to make enhancements to our products and technology platforms that are intended to drive more account placements in our small commercial and middle market businesses. In small commercial, we have gained significant momentum with the launch of TAP Sales, our new agent quote-and-issue platform, making it easier and more efficient for our agents to do business with us, leveraging our agency analytics capabilities, comprehensive service center offering, and full suite of digital self-service tools. In middle market, we maintained our focus on specialized industry segments, a key area of market differentiation. We continued to grow our most profitable industry segments, including technology, human services and financial institutions, taking a measured approach in more challenging segments. We also capitalized on the strength of our localized field structure, creating a competitive advantage in sourcing new business, as well as our robust claims and risk management capabilities.

We believe our small commercial capabilities and distinctiveness in the middle market, including our diversified portfolio of products, enable us to deliver significant value to our agents and policyholders. We believe these efforts will enable us to continue to improve the overall mix of our business and ultimately our underwriting profitability.

Specialty

Our Specialty segment generated $1.3 billion, or 22.5%, of consolidated operating revenues and $1.2 billion, or 22.7%, of net premiums written, for the year ended December 31, 2022.

The following table provides net premiums written by line of business for our Specialty segment.

YEAR ENDED DECEMBER 31, 2022	Net Premiums Written	% of Total
(in millions, except ratios)		
Professional and Executive Lines	$ 410.5	33.0%
Specialty Property & Casualty	402.1	32.3
Marine	360.2	29.0
Surety and Other	70.9	5.7
Total	$ 1,243.7	100.0%

Specialty offers a comprehensive suite of products focused predominately on small to mid-sized businesses. This includes numerous specialized products that are organized into four distinct divisions:

Professional and Executive Lines coverage is primarily composed of professional, management, and medical liability, which provides protection for directors, officers and other employees of companies that may be sued in connection with their performance, and errors and omissions protection to companies and individuals against negligence or bad faith, as well as protection for employment practices liability.

Specialty Property & Casualty is comprised of:

- *Hanover Programs* business which offers coverage to markets where there are specialty underwriting or risk management needs related to groups of similar businesses;
- *Hanover Specialty Industrial* business which provides property insurance to small and medium-sized chemical, paint, solvent and other manufacturing and distribution companies, and fire and allied lines coverages;
- *Excess & Surplus* business that includes non-admitted general liability and property coverage to risks outside of the appetite of standard commercial lines; and,
- *Specialty General Liability* encompasses admitted coverages for higher hazard liability risks.

Marine coverage includes inland and ocean marine, and insures businesses against physical losses to property, such as contractor's equipment, builders' risk and goods in transit, and also covers jewelers block, fine art and other valuables.

Surety and Other includes coverage for construction and other firms, as well as sole proprietors in the event of claims for non-performance or non-payment, and commercial surety coverage related to fiduciary or regulatory obligations.

We have continued to invest in our Specialty businesses, refining our broad product offering, focusing on the lower end of the risk and account-sized spectrum, leveraging our highly regarded service center, which has been, and we expect will continue to be, a critical growth lever for us. We have successfully developed a robust, diversified and profitable Specialty segment that we believe represents a distinct competitive advantage, with eight dedicated businesses and 17 distinct product areas.

We believe that this distribution of Specialty products, primarily through retail agents supplemented by select specialists helps to enhance our overall agent value and increase growth opportunities by providing agents easier access to placement solutions for Specialty needs, including those that complement Core Commercial accounts.

Personal Lines

Our Personal Lines segment generated $2.2 billion, or 39.7%, of consolidated operating revenues and $2.2 billion, or 40.8%, of net premiums written, for the year ended December 31, 2022.

The following table provides net premiums written by line of business for our Personal Lines segment.

YEAR ENDED DECEMBER 31, 2022	Net Premiums Written	% of Total
(in millions, except ratios)		
Personal automobile	$ 1,317.2	59.0%
Homeowners and Other	915.7	41.0
Total	$ 2,232.9	100.0%

Personal Lines coverages include:

Personal automobile coverage insures individuals against losses incurred from personal bodily injury, bodily injury to third parties, property damage to an insured's vehicle, and property damage to other vehicles and other property.

Homeowners and other personal lines coverages insure individuals for losses related to:

- residences and personal property, such as those caused by fire, wind, hail, water damage (excluding flood), theft and vandalism;
- liability claims by a third-party for bodily injury and/or property damage experienced at residences; and,
- personal umbrella, inland marine (jewelry, art, etc.), fire, personal watercraft, personal cyber and other miscellaneous coverages.

Our strategy in Personal Lines is to provide account–oriented business (i.e., writing both an insured's automobile and homeowners insurance, along with other Personal Lines coverages when applicable) through select independent agents, with a focus on increasing geographic diversification. The market for our Personal Lines business is very competitive, with continued pressure on independent agents from direct insurance writers, as well as from the increased usage of real time comparative rating tools and increasingly sophisticated rating and pricing tools. We maintain a focus on working with high quality, value-added agents that stress the importance of consultative selling and account rounding (the conversion of single policy customers to accounts with multiple policies and/or additional coverages, to address customers' broader objectives). We are focused on making business investments that are intended to help us maintain profitability, build a distinctive position in the market, deliver value to agents and customers, and provide us with profitable growth opportunities. We continue to refine our products and to work closely with these high-potential agents to increase the percentage of business they place with us and to ensure that it is consistent with our preferred mix of business. Additionally, we remain focused on further diversifying our geographic mix beyond our largest historical core states of Michigan and Massachusetts. We expect these efforts to decrease our risk concentrations and our dependency on these states, as well as to contribute to improved profitability over time.

Other

The Other segment primarily includes Opus, which provides investment advisory services to affiliates and also manages approximately $2.0 billion of assets for unaffiliated institutions, such as insurance companies, retirement plans and foundations. The Other segment also includes earnings on holding company assets; holding company and other expenses, including certain costs associated with retirement benefits due to former life insurance employees and agents; our run-off voluntary property and casualty pools business; and our run-off direct asbestos and environmental business.

MARKETING AND DISTRIBUTION

We serve a variety of standard, specialty and targeted industry markets. Consistent with our objective to diversify our underwriting risks on a geographic and line of business basis, our business is currently comprised of approximately 41% Personal Lines, 36% Core Commercial, and 23% Specialty. Core Commercial, including our small and middle market businesses, Personal Lines and the majority of our Specialty business distribute our products primarily through a network of independent agents.

Core Commercial, Specialty and Personal Lines

Our Core Commercial, Specialty and Personal Lines independent agency distribution and field structure are designed to maintain a strong focus on local markets and the flexibility to respond to specific market conditions. During 2022, we wrote 19.7% of our Core Commercial, Specialty and Personal Lines business in Michigan and 8.6% in Massachusetts. Our localized field management structure is a key factor in the establishment and maintenance of productive, long-term relationships with well-established independent agencies. We maintain 35 local offices across 23 states. The majority of processing support for these locations is provided from our Worcester, Massachusetts; Howell, Michigan; Salem, Virginia; and Windsor, Connecticut offices.

Independent agents account for substantially all of the sales of our Core Commercial and Personal Lines property and casualty products, and the majority of our Specialty products. However, some Specialty business, such as Hanover Programs, is also distributed through managing general agents or wholesale distributors who have expertise in the industries served or products offered. We appoint agencies based on profitability, track record, financial stability, growth potential, professionalism and business strategy. Once appointed, we monitor their performance and, subject to legal and regulatory requirements, may take actions as necessary to change these business relationships, such as discontinuing the authority of the agent to underwrite certain products, or revising commissions or bonus opportunities. We compensate agents primarily through base commissions and bonus plans that are tied to an agency's written premium, growth and profitability.

We are licensed to sell property and casualty insurance in all fifty states in the U.S., as well as in the District of Columbia ("D.C."). Throughout the U.S., we actively market Core Commercial and Specialty policies in 40 states and D.C., and Personal Lines policies in 20 states.

The following table provides our top Core Commercial, Specialty and Personal Lines geographical markets based on total net premiums written in each state in 2022.

YEAR ENDED DECEMBER 31, 2022	Core Commercial		Specialty		Personal Lines		Total	
(in millions, except ratios)	Net Premiums Written	% of Total	Net Premiums Written	% of Total	Net Premiums Written	% of Total	Net Premiums Written	% of Total
Michigan	$ 109.3	5.5%	$ 51.1	4.1%	$ 917.6	41.1%	$ 1,078.0	19.7%
Massachusetts	156.5	7.8	57.2	4.6	257.3	11.5	471.0	8.6
New York	148.2	7.4	98.9	7.9	138.5	6.2	385.6	7.0
California	229.2	11.5	156.2	12.6	—	—	385.4	7.0
Illinois	106.6	5.3	53.0	4.3	133.5	6.0	293.1	5.3
Texas	158.0	7.9	120.1	9.7	—	—	278.1	5.1
New Jersey	110.2	5.5	49.0	3.9	84.0	3.8	243.2	4.4
Connecticut	48.4	2.4	17.5	1.4	135.7	6.1	201.6	3.7
Georgia	74.1	3.7	38.5	3.1	71.0	3.2	183.6	3.4
Virginia	66.2	3.3	35.3	2.8	40.2	1.8	141.7	2.6
Maine	54.7	2.7	16.6	1.3	57.5	2.6	128.8	2.4
Pennsylvania	49.2	2.5	30.9	2.5	47.0	2.1	127.1	2.3
Wisconsin	43.8	2.2	23.2	1.9	58.2	2.6	125.2	2.3
Indiana	41.6	2.1	24.5	2.0	37.2	1.7	103.3	1.9
Tennessee	29.6	1.5	26.2	2.1	47.5	2.1	103.3	1.9
Minnesota	68.4	3.4	28.4	2.3	—	—	96.8	1.8
North Carolina	58.3	2.9	37.6	3.0	0.6	—	96.5	1.8
Ohio	23.5	1.2	23.9	1.9	43.1	1.9	90.5	1.6
Florida	38.9	1.9	47.5	3.8	—	—	86.4	1.6
New Hampshire	35.3	1.8	11.4	0.9	38.8	1.7	85.5	1.5
Other	349.9	17.5	296.7	23.9	125.2	5.6	771.8	14.1
Total	$ 1,999.9	100.0%	$ 1,243.7	100.0%	$ 2,232.9	100.0%	$ 5,476.5	100.0%

We manage our Core Commercial and Specialty business portfolio with a focus on growth from the most profitable industry segments within our underwriting expertise. Our Core Commercial business is generally comprised of several complementary commercial lines of business, consisting of small and middle market accounts, which include targeted industry segments. Additionally, in our Specialty segment, we have multiple specialty lines of business. We seek to maintain strong agency relationships as an approach to secure and retain our agents' best accounts. We monitor the quality of our business written through ongoing quality reviews, accountability for which is shared at the local, regional and corporate levels.

We manage our Personal Lines business with a focus on acquiring and retaining preferred accounts. Currently, approximately 88% of our policies in force are account business. Approximately 53% of our Personal Lines net premiums written is generated in the combined states of Michigan and Massachusetts. In Michigan, based upon direct premiums written for 2022, we underwrite approximately 7% of the state's total market.

Approximately 64% of our Michigan Personal Lines net premium written is in the personal automobile line and 33% is in the homeowners line. Michigan business represents approximately 45% of our total personal automobile net premiums written and approximately 37% of our total homeowners net premiums written. In Michigan, we are a principal market for many of our appointed agencies, with approximately $2.3 million of total direct premiums written, per agency, in 2022.

In addition, in 2019, Michigan enacted major reforms of its system governing personal and commercial automobile insurance, especially related to automobile Personal Injury Protection ("PIP") coverage. We believe that we are effectively executing the transition to the reformed system and expect to navigate this market successfully. As of December 31, 2022, the net impact of these reforms was not significant to our total net premiums written and underwriting profit. For the full year 2022, net premiums written that were attributable to PIP coverage in Michigan were $141.6 million, or 2.6% of our total company full year 2022 net premiums written, while Michigan personal automobile net premiums written represented 10.7% of our total company full year 2022 net premiums written. See also "Risk Factors" in Part I – Item 1A.

Approximately 65% of our Massachusetts Personal Lines net premium written is in the personal automobile line and 31% is in the homeowners line. Massachusetts business represents approximately 13% of our total personal automobile net premiums written and approximately 10% of our total homeowners net premiums written.

We sponsor local and national agent advisory councils to gain the benefit of our agents' insight and enhance our relationships. These councils and our other strong agency relationships provide market and operational feedback, input on the development of products and services, guidance on marketing efforts, support for our strategies, and assist us in enhancing our local market presence.

Other

With respect to our Other segment, we market our third-party investment advisory services directly through Opus.

PRICING AND COMPETITION

The property and casualty insurance industry is a very competitive market. In our Core Commercial, Specialty and Personal Lines segments, we market and distribute through independent agents and brokers, and compete for business on the basis of product, price, agency and customer service, local relationships, ratings and effective claims handling, among other things. Our competitors include national, international, regional and local companies that sell insurance through various distribution channels, including independent agencies, captive agency forces, brokers, and direct to consumers through the internet or otherwise. They also include mutual insurance companies, reciprocals and exchanges. We believe that our emphasis on maintaining strong agency relationships and a local presence in our markets, coupled with investments in products, operating efficiency, technology and effective claims handling, enable us to differentiate ourselves and compete more effectively. Our broad product offerings in Core Commercial and Specialty and total account strategy in Personal Lines are instrumental to our ability to capitalize on these relationships and improve profitability.

We seek to achieve targeted combined ratios in each of our product lines. Targets vary by product and geography and change with market conditions. The targeted combined ratios reflect competitive market conditions, investment yield expectations, our loss payout patterns and target returns on equity. This approach is intended to enable us to achieve measured growth and consistent profitability.

For all major product lines in the Core Commercial, Specialty and Personal Lines segments, we employ pricing teams that produce exposure and experience-based rating models, some of which require regulatory approval, to support underwriting and pricing decisions. In addition, we seek to utilize our understanding of local markets to achieve superior underwriting results. We rely on market information provided by our local agents and on the knowledge of staff in the local branch offices. Since we maintain a strong local presence in many regions and a significant market share in a number of states, we can better apply our knowledge and experience in making underwriting and rate setting decisions. Also, we seek to gather objective and verifiable information at a policy level during the underwriting process, including prior loss experience, past driving records and, where permitted, credit histories.

CLAIMS MANAGEMENT

Claims management includes the receipt of initial loss notifications, generation of appropriate responses to claim reports, loss appraisals, identification and handling of coverage issues, determination of whether further investigation is required, retention of legal representation, where appropriate, establishment of case reserves, approval of loss payments, and notification to reinsurers. Part of our strategy focuses on efficient, timely and fair claim settlements to meet customer service expectations and maintain valuable independent agent relationships. Additionally, effective claims management is important to our business since claim payments and related loss adjustment expenses are our largest expenditures.

We utilize experienced claims adjusters, appraisers, medical specialists, managers and attorneys to manage our claims. Our property and casualty operations have both virtual and field claims adjusters located throughout the states and regions in which we do business. Claims staff members often work closely with the independent agents who bound the policies under which coverage is claimed. Claims adjusting staff are supported by general adjusters for large property and casualty losses, by automobile and heavy equipment damage appraisers for automobile material damage losses, and by medical specialists whose principal concentration is on workers' compensation and automobile injury cases. Additionally, the claims staff are supported by staff attorneys who specialize in litigation defense and claim settlements. We have a catastrophe response team to assist policyholders impacted by severe weather events. This team mobilizes quickly to impacted regions, often in advance for a large tracked storm, to support our local claims adjusters and facilitate a timely response to resulting claims. We also maintain a special unit that investigates suspected insurance fraud and abuse. We utilize claims processing technology, such as customer self-service applications and photo analytics technology, that enables most of the smaller and more routine Personal Lines claims to be processed at centralized locations.

CATASTROPHES

We are subject to claims arising out of catastrophes, which historically have had a significant impact on our results of operations and financial condition. Coverage for such events is a core part of our business, and we expect to experience catastrophe losses in the future, which could have a material adverse impact on our financial results. Catastrophes can be caused by various events, including, among others, hurricanes, tornadoes and other windstorms, earthquakes, hail, severe winter weather, fire, explosions, riots, and terrorism. The incidence and severity of catastrophes are volatile and difficult to predict.

We endeavor to manage our catastrophe risks through underwriting procedures, including the use of deductibles and specific restrictions for flood and earthquake coverage, subject to regulatory restrictions and competitive pressures, and through geographic exposure management and reinsurance. Our catastrophe reinsurance program is structured to protect us on a per-occurrence and aggregate excess basis. We monitor geographic location and coverage concentrations with a view toward managing corporate exposure to catastrophic events. Although catastrophes can cause losses in a variety of property and casualty lines, commercial multiple peril and homeowners property coverages have, in the past, generated the majority of catastrophe-related claims.

REINSURANCE

Reinsurance Program Overview

We maintain ceded reinsurance programs designed to protect against large or unusual loss and LAE activity. We utilize a variety of proportional and non-proportional reinsurance agreements, which are intended to control our individual policy and aggregate exposure to large property and casualty losses, stabilize earnings and protect capital resources. These programs include facultative reinsurance (to limit exposure on a specified risk); specific excess and proportional treaty reinsurance (to limit exposure on individual policies or risks within specified classes of business); and catastrophe excess of loss reinsurance (to limit exposure to any one event that might impact more than one individual policy). Our proportional reinsurance consists of quota share reinsurance agreements and our non-proportional reinsurance includes excess of loss and stop loss reinsurance agreements.

Catastrophe reinsurance is designed to protect us, as the ceding insurer, from significant losses arising from a single event including, among others, hurricanes, tornadoes and other windstorms, earthquakes, hail, severe winter weather, fire, explosions, riots, flood and terrorism. We determine the appropriate amount of reinsurance based on our evaluation of the risks insured, exposure analyses prepared by advisors, our risk appetite and market conditions, including the availability and pricing of reinsurance. Although we believe our catastrophe reinsurance program, including our retention and co-participation amounts for 2023, is appropriate given our surplus level and the current reinsurance pricing environment, there can be no assurance that our reinsurance program will provide coverage levels that will prove adequate should we experience losses from one significant or several large catastrophes during 2023. Additionally, as a result of the current economic environment, as well as losses incurred by reinsurers in the past several years, the availability and pricing of appropriate reinsurance programs may be adversely affected in future renewal periods. We may not be able to pass these costs on to policyholders, or there may be a delay in passing these costs to policyholders, in the form of higher premiums or assessments.

We cede to reinsurers a portion of our risk based upon insurance policies subject to such reinsurance. Reinsurance contracts do not relieve us from our obligations to policyholders. Failure of reinsurers to honor their obligations could result in losses to us. We believe that the terms of our reinsurance contracts are consistent with industry practice in that they contain standard terms with respect to lines of business covered, limit and retention, arbitration and occurrence. Subsequent to the emergence of COVID-19 in March 2020, some of our reinsurance contract renewals contain varying forms of pandemic and other exclusions, which we believe are consistent with current reinsurance contract exclusions in the market generally. We believe our reinsurers are financially sound, based upon our ongoing review of the financial strength ratings assigned to them by rating agencies, their reputations in the reinsurance marketplace, our collections history, information and advice from third parties, and the analysis and guidance of our reinsurance advisors.

Reference is made to Note 13 — “Reinsurance” in the Notes to Consolidated Financial Statements. Reference is also made to “Involuntary Residual Markets” below.

Our 2023 reinsurance program for our Core Commercial, Specialty and Personal Lines segments is fundamentally similar to our 2022 program. The following discussion summarizes both our 2022 and 2023 reinsurance programs for our Core Commercial, Specialty and Personal Lines segments (excluding coverage available under the U.S. federal terrorism program which is described below under “Terrorism”), but does not purport to be a complete description of the program or the various restrictions or limitations which may apply:

- Our Core Commercial, Specialty and Personal Lines segments are primarily protected by a property catastrophe occurrence excess of loss reinsurance treaty, a property per risk excess of loss treaty, as well as a casualty excess of loss treaty, with retentions of $200 million, $3 million, and $2 million, respectively.
- The property catastrophe occurrence excess of loss reinsurance policy provides coverage, on an occurrence basis, up to $1.3 billion, less a $200 million retention, with no co-participation, for all defined perils. For occurrences from $1.3 billion to $1.45 billion, we have coverage for 33% of losses where losses are not covered by the catastrophe bond, discussed further below. In the event the catastrophe bond is utilized, this additional $150 million in limit (33% placed) is available above $1.45 billion. Additionally, effective July 1, 2022 we chose not to renew our reinsurance coverage for aggregate catastrophe losses.
- The property per risk excess of loss treaty provides coverage, on a per risk basis, up to $100 million, less a $3 million retention, with a co-participation for the second half of 2022 and the first half 2023 of 57.5% for reinsurance placed in the $3 million to $5 million layer, 9.65% for reinsurance in the $5 million to $12.5 million layer, 17.6% in the $12.5 million to $25 million layer, and no co-participation for reinsurance layers placed between $25 million and $100 million. Effective July 2022, there is no annual aggregate deductible within the property per risk excess of loss treaty.
- In 2022, the casualty excess of loss treaty provides coverage, on a per occurrence basis for each loss, up to $75 million less a $2 million retention, with a co-participation of 13.5% in the $2 million to $5 million layer, and no co-participation for reinsurance layers placed between $5 million and $75 million.

- For 2022 and 2023, Core Commercial and Specialty segments are further protected by excess of loss treaty agreements for specific lines of business. For example, the Specialty segment's surety and fidelity bond excess of loss treaty provides coverage, on a per principal basis, up to $40 million, less a $7.5 million retention, with no co-participation.
- In addition to certain layers of coverage discussed above, within our Specialty segment, our Specialty P&C business also includes surplus share, quota share, excess of loss, stop loss, facultative and other forms of reinsurance that cover the writings from Hanover Programs. There are a variety of different programs, and the reinsurance structure is generally customized to fit the exposure profile for each program.

Our intention is to renew the surety and fidelity bond treaty, the property per risk excess of loss treaty and the property catastrophe occurrence excess of loss treaty in July 2023 with the same or similar terms and conditions, but there can be no assurance that we will be able to maintain our current levels of reinsurance, pricing and terms and conditions. Our 2023 casualty excess of loss treaty is effective January 1, 2023.

During 2021, we entered into an agreement to transfer our Excess and Casualty Reinsurance Association ("ECRA") pool participations to a third-party reinsurer. This transfer was executed through a 100% reinsurance arrangement for our ECRA claim liability participations, which were written during the period 1950 to 1982. In 1982, the pool was dissolved and since that time, the business has been in run-off. This transaction had no significant impact on our results of operations.

Catastrophe Bonds

Effective July 1, 2022, we secured new catastrophe protection through a per occurrence excess of loss reinsurance agreement with Commonwealth Re Ltd. ("Commonwealth Re"), an independent company, licensed as a Special Purpose Insurer in Bermuda. The reinsurance agreement meets the requirements to be accounted for as reinsurance in accordance with the guidance for reinsurance contracts. In connection with the reinsurance agreement, Commonwealth Re issued notes (generally referred to as "catastrophe bonds") to investors in amounts totaling $150.0 million, consistent with the amount of coverage provided under the reinsurance agreement as described below. The proceeds were deposited in a reinsurance trust account.

The reinsurance agreement provides us with coverage of up to $150.0 million through June 30, 2025, for catastrophe losses from named tropical storms or hurricanes, including all events or perils directly resulting from such storm or storm system, which may include, by way of example and not limitation, hurricane, wind, gusts, typhoon, hail, rain, tornadoes, cyclones, ensuing flood, storm surge, water damage, fire following, sprinkler leakage, riots, vandalism, and collapse. For events up to and including June 30, 2025, we are entitled to begin recovering amounts under this reinsurance agreement if the covered losses in the covered area for a single occurrence reach an initial attachment amount of $1.3 billion. The full $150.0 million coverage amount is available until such covered losses reach a maximum $1.45 billion. The attachment level and the maximum level (or exhaustion level) under this agreement may be reset annually to adjust the expected loss of the layer within a predetermined range. The coverage under the reinsurance agreement is limited to specified personal and commercial property coverage written in the following geographies in the United States: Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont and Virginia.

Under the terms of the reinsurance agreement, we are obligated to pay annual reinsurance premiums to Commonwealth Re for the reinsurance coverage. Amounts payable under the reinsurance agreement with respect to any covered event cannot exceed our actual losses from such event. The principal amount of the catastrophe bonds will be reduced by any amounts paid to us under the reinsurance agreement.

As with any reinsurance agreement, there is credit risk associated with collecting amounts due from reinsurers. With regard to Commonwealth Re, since the reinsurance coverage is fully collateralized by the proceeds from the catastrophe bond offering, the credit risk is largely mitigated. Commonwealth Re has funded a reinsurance trust account with money market funds that invest primarily in cash or direct U.S. federal government obligations and obligations backed by the U.S. federal government with maturities of no more than 397 calendar days. The money market funds must have a principal stability rating of at least AAAm by Standard & Poor's or Aaa by Moody's on the issuance date of the bonds and thereafter must be rated by Standard & Poor's and Moody's, as applicable.

At the time the agreement was entered into with Commonwealth Re, we evaluated the applicability of the accounting guidance that addresses variable interest entities ("VIE"). Under this guidance, an entity that is formed for business purposes is considered a VIE if (a) the equity investors lack the direct or indirect ability through voting rights or similar rights to make decisions about an entity's activities that have a significant effect on the entity's operations or (b) the equity investors do not provide sufficient financial resources for the entity to support its activities. Additionally, a company that absorbs a majority of the expected losses from a VIE's activities or is entitled to receive a majority of the entity's expected residual returns, or both, is considered to be the primary beneficiary of the VIE and is required to consolidate the VIE in the company's financial statements. We concluded that Commonwealth Re was a VIE because the conditions described in items (a) and (b) above were present. However, while Commonwealth Re was determined to be a VIE, we concluded that we do not have a variable interest in the entity, as the variability in its results, caused by the reinsurance agreement, is

expected to be absorbed entirely by the investors in the catastrophe bonds issued by Commonwealth Re and residual amounts earned by it, if any, are expected to be absorbed by the equity investors (we have neither an equity nor a residual interest in Commonwealth Re). Accordingly, we are not the primary beneficiary of Commonwealth Re and do not consolidate that entity in our consolidated financial statements. Additionally, because we have no intention to pursue any transaction that would result in our acquisition of an interest in and becoming the primary beneficiary of Commonwealth Re, the consolidation of that entity in our consolidated financial statements in future periods is unlikely.

Terrorism

As a result of the continuing threat of terrorist attacks, the insurance industry maintains a high level of focus with respect to the potential for losses caused by terrorist acts. Insured losses may encompass people, property and business operations covered under workers' compensation, commercial multiple peril and other commercial lines policies, in both our Core Commercial and Specialty lines, as well as Personal Lines policies. In certain cases, such as workers' compensation, we are not able to exclude coverage for these losses, either because of regulatory requirements or competitive pressures. Losses caused by terrorist acts are not excluded from homeowners or personal automobile policies. We continually evaluate the potential effect of these low frequency, but potentially high severity, events in our overall pricing and underwriting plans, especially for policies written in major metropolitan areas.

Although certain terrorism-related risks embedded in our Core Commercial, Specialty and Personal Lines are covered under the existing Catastrophe, Property per Risk and Casualty Excess of Loss corporate reinsurance treaties (see "Reinsurance – Reinsurance Program Overview" above for additional information), private sector catastrophe reinsurance is limited or unavailable for losses attributed to acts of terrorism, particularly those involving nuclear, biological, chemical and/or radiological events. As a result, the industry's primary reinsurance protection against large-scale terrorist attacks in the U.S. is provided through a federal program that provides compensation for insured losses resulting from acts of terrorism.

The Terrorism Risk Insurance Act of 2002 first established the Terrorism Risk Insurance Program (the "Program"). Coverage under the Program applies to workers' compensation, commercial multiple peril and certain other commercial lines policies in both our Core Commercial and Specialty segments for direct written policies. The Program will expire in December 2027. All commercial property and casualty insurers are required to participate in the Program. Under the Program, a participating issuer, in exchange for making terrorism insurance available, may be entitled to be reimbursed by the Federal government for a portion of its aggregate losses. The Program does not cover losses in surety within Specialty, Personal Lines or certain other lines of business.

As required by the Program, we offer policyholders in specific lines of commercial insurance the option to elect terrorism coverage. In order for a loss event to be reinsured under the Program, the loss event must meet aggregate industry loss minimums and must be the result of an act of terrorism as certified by the Secretary of the Treasury in consultation with the Secretary of Homeland Security and the U.S. Attorney General. Losses from events which do not qualify or are not so certified will not receive the benefit of the Program. Such losses may be deemed covered losses under the insured's policy whether or not terrorism coverage was purchased. Further, under the Terrorism Risk Insurance Program Reauthorization Act of 2019, our share of U.S. domestic losses in 2022 from such events, if deemed certified terrorist events, would have been limited to 20% of losses in excess of an approximate $501 million deductible, which represented 18.4% of year-end 2021 statutory policyholder surplus of our insurers, and, is estimated to be $555 million in 2023, representing 20.6% of 2022 year-end statutory policyholder surplus, up to a combined annual aggregate limit for the federal government and all insurers of $100 billion.

Given the unpredictability of terrorism losses, future losses from acts of terrorism could be material to our operating results, financial position, and/or liquidity. We attempt to manage our exposures on an individual line of business basis and in the aggregate by one-half square mile grids in major metropolitan areas.

Reinsurance Recoverables

When we experience loss events that are subject to a reinsurance contract, reinsurance recoverables are recorded. The amount of the recorded reinsurance recoverable depends on the estimated size of the individual loss or the aggregate amount of all losses in a particular line, book of business or an aggregate amount associated with a particular accident year. The valuation of losses recoverable depends on whether the underlying loss is a reported loss, or an incurred but not reported loss. For reported losses, we value reinsurance recoverables at the time the underlying loss is recognized, in accordance with contract terms. For incurred but not reported losses, we estimate the amount of reinsurance recoverable based on the terms of the reinsurance contracts and historical reinsurance recovery information and apply that information to the gross loss reserve estimates. The most significant assumption we use is the average size of the individual losses that will exceed our reinsurance retentions for those claims that have occurred but have not yet been reported to us. The reinsurance recoverable is based on what we believe are reasonable estimates and is disclosed separately on the financial statements. However, the ultimate amount of the reinsurance recoverable is not known until all losses are settled.

Other than our investment portfolio, the single largest asset class is our reinsurance recoverables, which consist of our estimate of amounts recoverable from reinsurers with respect to losses incurred to date (including losses incurred but not reported) and unearned premiums, net of amounts estimated to be uncollectible. These estimates are expected to be revised at each reporting period and such revisions, which could be material, affect our results of operations and financial position. Reinsurance recoverables include amounts due from state mandatory reinsurance or other involuntary risk sharing mechanisms, and private reinsurers to whom we have voluntarily ceded business.

We are subject to concentration of risk with respect to reinsurance ceded to various mandatory residual markets, facilities and pooling mechanisms. As a condition to conduct business in various states, we are required to participate in residual market mechanisms, facilities and pooling arrangements, which usually are designed to provide insurance coverages to individuals or other entities that are otherwise unable to purchase such coverage voluntarily or at rates deemed reasonable. These market mechanisms, facilities and pooling arrangements comprise $893.5 million of our total reinsurance recoverables on paid and unpaid losses and unearned premiums at December 31, 2022, $883.0 million of which is attributable to the Michigan Catastrophic Claims Association ("MCCA").

The MCCA is a mandatory reinsurance association that reinsures claims that arise under Michigan's unlimited personal injury protection coverage, which is one of the available coverage options under Michigan's no-fault automobile insurance statute. The MCCA reinsures all such claims in excess of a statutorily established company retention, currently $600,000. Funding for the MCCA comes from assessments against automobile insurers based upon their share of insured automobiles in the state for which the policyholders have elected unlimited PIP benefits. Insurers are allowed to pass along this cost to Michigan automobile policyholders. This recoverable accounted for 54% and 57% of our total personal automobile gross reserves at December 31, 2022 and 2021, respectively. Because the MCCA is supported by assessments permitted by statute, and there have been no significant uncollectible balances from MCCA identified during the three years ending December 31, 2022, we believe that we have no significant exposure to uncollectible reinsurance balances from this entity.

In 2021, the MCCA Board voted unanimously to return approximately $3.0 billion of its estimated surplus to policyholders through its member insurance companies. This action occurred because the association's surplus was deemed to have increased beyond a level necessary to cover its expected losses and expenses. Since policyholders are the ultimate payers of the MCCA premium, this return of MCCA surplus was passed through to policyholders. The refund was paid to policyholders and was recorded as a refund of premium transaction in our financial statements, reducing both direct written premium and ceded written premium. There was no effect on net written premium or net earned premium. The total amount of the refund was approximately $183.2 million, comprised of $179.1 million for personal automobile and $4.1 million for commercial automobile policyholders.

In addition to the reinsurance ceded to various residual market mechanisms, facilities and pooling arrangements, we had $1,071.0 million of reinsurance assets due from traditional reinsurers as of December 31, 2022. These amounts are due principally from highly-rated reinsurers, defined as rated A- or higher by A.M. Best or other equivalent rating agencies. In certain instances, for example in our Hanover Programs business, we also require, from the reinsurer, a deposit of assets in trust, letters of credit or other acceptable collateral in order to support balances due from reinsurers that provide reinsurance only on a collateralized basis.

The following table displays balances recoverable from our ten largest reinsurance groups at December 31, 2022, along with the A.M. Best rating for each group's ultimate parent or lead rating unit, if an A.M. Best rating is available. Reinsurance recoverables are comprised of paid losses recoverable, outstanding losses recoverable, incurred but not reported losses recoverable, and ceded unearned premium.

REINSURERS	A.M. Best Rating	Reinsurance Recoverable
(in millions)		
HDI Group (Hannover Ruckversicherungs AG)	A+	$ 177.6
Berkshire Hathaway Inc. (Transatlantic Reinsurance Co. and General Reinsurance Corp)	A++	127.5
Lloyd's Syndicates	A	110.7
Swiss Re Ltd.	A+	88.4
Toa Reinsurance Company Ltd.	A	77.8
Munich Reinsurance Companies	A+	71.7
Societe De Groupe D' Assurance Mut Covea (Partner Reinsurance Company of the U.S.)	A+	41.3
Axis Capital Holding Limited	A	36.7
Atlantic Gateway	(1)	23.8
Allianz SE	A+	22.0
Subtotal		777.5
All other reinsurers		293.5
Residual markets, facilities, and pooling arrangements		893.5
Total		$ 1,964.5

(1) No AM Best rating available. Reinsurance recoverable fully collateralized by assets in trust.

Reinsurance recoverable balances in the table above are shown before consideration of balances owed to reinsurers and any potential rights of offset, including collateral held by us, and are net of an allowance for uncollectible recoverables. Reinsurance treaties are generally purchased on an annual basis. Treaties typically contain provisions that allow us to demand that a reinsurer post letters of credit or assets as security if a reinsurer is an unauthorized reinsurer under applicable regulations or if its rating falls below a predetermined contractual level. In regards to reinsurance recoverables due from Lloyd's Syndicates, as part of the Lloyd's "chain of security" afforded to all of its policyholders, recourse is available through the Lloyd's Central Fund in the event of the failure of an individual syndicate and its capital providers.

Although reinsurance makes the reinsurer liable to us to the extent the risk is transferred or ceded to the reinsurer, ceded reinsurance arrangements do not eliminate our obligation to pay claims to our policyholders. Accordingly, we bear credit risk with respect to our reinsurers. Specifically, our reinsurers may not pay claims made by us on a timely basis, or they may not pay some or all of these claims. In addition, from time to time, insurers and reinsurers may disagree on the scope of the reinsurance or on the underlying insured risks. Any of these events would increase our costs and could have a material adverse effect on our business.

We have established a reserve for uncollectible reinsurance of $7.9 million as of December 31, 2022, or 0.4% of the total reinsurance recoverable balance, which was determined by considering reinsurer specific default risk on paid and unpaid recoverables as indicated by their financial strength ratings, any ongoing solvency issues, any current risk of dispute on paid recoverables, and our past collection experience. There have been no significant balances determined to be uncollectible and thus no significant charges recorded during 2022 for uncollectible reinsurance recoverables.

Our exposure to credit risk from any one reinsurer is managed through diversification by reinsuring with a number of different reinsurers, principally in the United States and European reinsurance markets. When reinsurance for our Core Commercial, Specialty and Personal Lines segments is placed, our standards of acceptability generally require that a reinsurer must have a minimum policyholder surplus of $500 million, a rating from A.M. Best and/or S&P Global of "A" or better, or an equivalent financial strength, if not rated. In addition, for lower rated or non-rated reinsurers, we customize collateral and restrict participation to effectively manage counterparty risk, with review and approval required by the counterparty credit committee.

REGULATION

Our insurance subsidiaries are subject to extensive regulation in the states in which they transact business and are supervised by the individual state insurance departments. Numerous aspects of our business are subject to regulation, including premium rates, mandatory covered risks, limitations on the ability to cancel, non-renew, reject business or limit writings in certain geographic areas, prohibited exclusions, licensing and appointment or termination of agents, restrictions on the size of risks that may be insured under a single policy, reserves and provisions for unearned premiums, losses and other obligations, deposits of securities for the benefit of policyholders, investments and capital, policy forms and coverages, advertising, claims handling, and other conduct, including restrictions on the use of credit information and other factors in underwriting, as well as other underwriting and claims practices. These restrictions limit the ability of insurers to underwrite or price policies on the basis of available third-party information (such as "social media") and "big data." Insurers are also subject to state laws and regulations governing the protection of their data systems and the use and protection of personal information collected in the ordinary course of operations. States also regulate various aspects of the contractual relationships between insurers and independent agents.

Such laws, rules and regulations are usually overseen and enforced by the various state insurance departments, as well as through private rights of action and by state attorneys general. Such regulations or enforcement actions are often responsive to current consumer and political sensitivities, such as automobile and homeowners insurance rates and coverage forms, or which may arise after a major event. Such rules and regulations may result in rate suppression, limit our ability to manage our exposure to unprofitable or volatile risks, require expenditures to facilitate compliance, or lead to fines, premium refunds or other adverse consequences. The federal government also may regulate aspects of our businesses, such as the use of insurance (credit) scores or other information in underwriting and the protection of confidential information.

In addition, as a condition to writing business in certain states, insurers are required to participate in various pools or risk sharing mechanisms or to accept certain classes of risk, regardless of whether such risks meet their underwriting requirements for voluntary business. Some states also limit or impose restrictions on the ability of an insurer to withdraw from certain classes of business. For example, Massachusetts, New York and California each impose material restrictions on a company's ability to materially reduce its exposures or to withdraw from certain lines of business in their respective states. The state insurance departments can impose significant charges on an insurer in connection with a market withdrawal or refuse to approve withdrawal plans on the grounds that they could lead to market disruption. Laws and regulations that limit cancellation and non-renewal of policies or that subject withdrawal plans to prior approval requirements may significantly restrict our ability to exit unprofitable markets. Such actions and related regulatory restrictions may limit our ability to reduce our potential exposure to hurricane and other catastrophe-related losses.

The insurance laws of many states subject property and casualty insurers doing business in those states to statutory property and casualty guaranty fund assessments. The purpose of a guaranty fund is to protect policyholders by requiring that solvent property and casualty insurers pay the insurance claims of insolvent insurers. These guaranty associations generally pay these claims by assessing solvent insurers proportionately based on each insurer's share of voluntary premiums written in the state. While most guaranty associations provide for recovery of assessments through subsequent rate increases, surcharges or premium tax credits, there is no assurance that insurers will ultimately recover these assessments, which could be material, particularly following a large catastrophe or in markets which become disrupted.

We are subject to periodic financial and market conduct examinations conducted by state insurance departments. We are also required to file annual and other reports with state insurance departments relating to the financial condition of our insurance subsidiaries and other matters. The National Association of Insurance Commissioners ("NAIC") and the Federal Insurance Office are each actively engaged in reviewing and considering proposed insurer risk-based capital standards, risk analysis, solvency assessments and other regulatory initiatives.

Other aspects of our business are subject to regulation as well. For example, Opus is subject to state and federal securities law, including regulation by the Securities and Exchange Commission ("SEC"), pertaining to the marketing and provision of institutional investment management services.

INVOLUNTARY RESIDUAL MARKETS

As noted above, as a condition of our license to write business in various states, we are required to participate in mandatory property and casualty residual market mechanisms which provide insurance coverages where such coverage may not otherwise be available or at rates deemed reasonable. Such mechanisms provide coverage primarily for personal and commercial property, personal and commercial automobile, and workers' compensation, and include assigned risk plans, reinsurance facilities and involuntary pools, joint underwriting associations, fair access to insurance requirements ("FAIR") plans and commercial automobile insurance plans.

For example, since most states compel the purchase of a minimal level of automobile liability insurance, states have developed shared market mechanisms to provide the required coverages and in many cases, optional coverages, to those drivers who, because of their driving records or other factors, cannot find insurers who will insure them voluntarily. Also, FAIR plans and other similar property insurance shared market mechanisms increase the availability of property insurance in circumstances where homeowners are unable to obtain insurance at rates deemed reasonable, such as in coastal areas or in areas subject to other hazards. Licensed insurers writing business in such states are often required to pay assessments to cover reserve deficiencies generated by such plans.

With respect to FAIR plans and other similar property insurance shared market mechanisms that have significant exposures, it is difficult to accurately estimate our potential financial exposure for future events. Assessments following a large coastal event, particularly one affecting Massachusetts, Texas, North Carolina or New York, or a large wildfire event affecting California, could be material to our results of operations. Our participation in such shared markets or pooling mechanisms is generally proportional to our direct writings for the type of coverage written by the specific pooling mechanism in the applicable state or other jurisdiction. For example, we are subject to mandatory participation in the Michigan Assigned Claims ("MAC") facility. MAC is an assigned claim plan covering people injured in uninsured motor vehicle accidents. Our participation in the MAC facility is based on our share of personal and commercial automobile direct written premium in the state and resulted in loss costs of $24.3 million in 2022. As a result of the aforementioned Michigan automobile reform that was effective July 2021, there is increased uncertainty regarding its impact on our future MAC facility loss costs. There were no other mandatory residual market mechanisms that were significant to our 2022 results of operations.

RESERVE FOR UNPAID LOSSES AND LOSS ADJUSTMENT EXPENSES

Reference is made to "Results of Operations – Segments – Reserve for Losses and Loss Adjustment Expenses" of Management's Discussion and Analysis for discussion of prior year development. Additionally, information regarding loss and LAE reserve development appears in Note 14 – "Liabilities for Outstanding Claims, Losses and Loss Adjustment Expenses" in the Notes to Consolidated Financial Statements.

The following table reconciles reserves determined in accordance with accounting practices prescribed or permitted by insurance statutory authorities ("Statutory") to reserves determined in accordance with generally accepted accounting principles ("GAAP"). The primary difference between the Statutory reserves and our GAAP reserves is the requirement, on a GAAP basis, to present reinsurance recoverables as an asset, whereas Statutory guidance provides that reserves are reflected net of the corresponding reinsurance recoverables. We do not use discounting techniques in establishing GAAP reserves for property and casualty losses and LAE.

DECEMBER 31	2022	2021	2020
(in millions)			
Statutory reserve for losses and LAE	**$ 5,371.0**	$ 4,862.3	$ 4,490.4
GAAP adjustments:			
Reinsurance recoverables on unpaid losses of our insurance subsidiaries	**1,748.6**	1,693.8	1,641.6
Statutory reserves for discontinued accident and health business	**(118.3)**	(117.9)	(116.2)
Other	**11.3**	9.4	8.2
GAAP reserve for losses and LAE	**$ 7,012.6**	$ 6,447.6	$ 6,024.0

Reserves for discontinued accident and health business of our insurance subsidiaries are included in liabilities of discontinued operations for GAAP and loss and loss adjustment expenses for Statutory reporting.

DISCONTINUED OPERATIONS

Discontinued operations primarily include our former accident and health insurance business. This discontinued accident and health business includes interests in 22 accident and health reinsurance pools and arrangements that we retained subsequent to the sale of First Allmerica Financial Life Insurance Company ("FAFLIC") in 2009. We ceased writing new premiums in this business in 1999, subject to certain contractual obligations. The reinsurance pool business consists primarily of long-term care, the medical and disability portions of workers' compensation risks, assumed personal accident, individual medical, long-term disability, and special risk business. This business also includes residual health insurance policies. Total reserves for the assumed accident and health business were $119.1 million at December 31, 2022. The long-term care pool accounted for approximately 75% of these reserves as of December 31, 2022. Reserves for the long-term care pool, individual medical, and residual health insurance policies are discounted. Reserves for all other assumed accident and health business are undiscounted. Assets and liabilities related to the discontinued accident and health business are reflected as assets and liabilities of discontinued businesses.

Loss estimates associated with substantially all of the discontinued accident and health business are provided by managers of each pool. We adopt reserve estimates for this business that consider this information, expected returns on assets assigned to this business and other facts. We update these reserves as new information becomes available and further events occur that may affect the ultimate resolution of unsettled claims. Based on information provided to us by the pool managers, we believe the reserves recorded related to this business are adequate. However, since reserve and claim cost estimates related to the discontinued accident and health business are dependent on several assumptions, including, but not limited to, morbidity, lapses, future premium rates, future health care costs, persistency of medical care inflation and investment performance, and these assumptions can be impacted by technical developments and advancements in the medical field, medical and long-term care inflation and other factors, there can be no assurance that the reserves established for this business will prove sufficient. Revisions to these reserves could have a material adverse effect on our results of operations for a particular quarterly or annual period or on our financial position. See also "Risk Factors" in Part I – Item 1A.

Our long-term care pool accounts for the majority of our remaining reinsurance pool business. The potential risk and exposure of our long-term care pool is based upon expected estimated claims and payment patterns, using assumptions for, among other things, morbidity, lapses, future premium rates, and the interest rate used for discounting the future projected cash flows, as well as regulatory developments affecting the ceding insurers. The long-term exposure of this pool depends upon how our actual experience compares with these future cash flow projection assumptions.

Also included in discontinued operations are our former life insurance and Chaucer businesses, which include activities that were not significant to our 2022 results. We retain indemnification obligations with respect to these businesses.

INVESTMENT PORTFOLIO

Our wholly owned subsidiary, Opus, is responsible for managing our investment portfolio. Opus directly manages our investment-grade fixed maturity portfolio and equity security portfolio, which together with cash, constituted approximately 87% of our total holdings at December 31, 2022. Opus is also responsible for the selection and monitoring of external asset managers for our commercial mortgage loan participations, limited partnership investments, high yield fixed maturity portfolio and leveraged loan holdings. We select and monitor external managers based on investment approach, track record of risk-adjusted returns and corporate governance.

Our investment strategy seeks to balance the goals of liquidity, capital preservation, net investment income stability and total return. The asset allocation process takes into consideration the profile and expected payout pattern of our liabilities, the level of capital required to support growth across lines of business and the risk profiles of a wide range of asset classes.

The majority of our assets are invested in investment grade fixed income securities across various sectors including U.S. government, municipal, corporate, residential and commercial mortgage-backed securities and asset-backed securities. Our holdings are diversified within and across major investment and industry sectors to mitigate concentration risk. We monitor the credit quality of our investments and our exposure to individual markets, borrowers, industries, sectors and, in the case of commercial mortgage-backed securities and commercial mortgage loan participations, property types and geographic locations. We consider Environmental, Social and Governance ("ESG") factors in our fundamental investment research process, because these important factors can influence the sustainability of an investment, and its risk and return profile.

Investments held by our regulated insurance subsidiaries are subject to state insurance statutes governing permitted investments. Investment considerations include asset/liability profile, including duration, convexity and other characteristics within specified risk tolerances. Our fixed maturity portfolio duration is approximately 4.3 years. We seek to maintain sufficient liquidity to support the cash flow requirements associated with our insurance and corporate liabilities by laddering the maturities within the portfolio, closely monitoring fixed maturity duration, and holding high-quality liquid public securities.

Reference is made to "Investments" in Management's Discussion and Analysis.

RATING AGENCIES

Insurance companies are rated by rating agencies to provide both industry participants and insurance consumers information on specific insurance companies. Higher ratings generally indicate the rating agencies' opinion regarding financial stability and a stronger ability to pay claims.

We believe that strong ratings are important factors in marketing our products to our agents and customers, since rating information is broadly disseminated and generally used throughout the industry. Insurance company financial strength ratings are assigned to an insurer based upon factors deemed by the rating agencies to be relevant to policyholders and are not directed toward protection of investors. Such ratings are neither a rating of securities nor a recommendation to buy, hold or sell any security. Customers typically focus on claims-paying ratings, while creditors focus on debt ratings. Investors consider both rating types when evaluating a company's overall financial strength.

EMPLOYEES AND HUMAN CAPITAL RESOURCES

As of December 31, 2022, we had approximately 4,600 employees, all of whom are located in the United States. We believe our relations with employees are positive, as evidenced by employee feedback received through employee surveys and other formal and informal channels.

To successfully operate our business, we rely on our corporate culture and on attracting, developing and retaining qualified employees to differentiate our company and deliver on our commitments to our independent agents, customers, investors and other stakeholders. The following is a description of the material human capital measures and objectives that management focuses on in managing the business with the oversight and support of our Board of Directors.

Inclusion, Diversity and Equity

We strive to foster an environment of inclusion, diversity and equity ("IDE") that welcomes the unique perspectives, experiences and insights of individuals from all backgrounds and walks of life, because we believe that this will lead to greater engagement of our employees in pursuit of our business objectives. Our goal is to continue to develop an inclusive and diverse workforce that fosters equity, innovation, respect and collaboration.

Management has focused on IDE within our workforce by developing a multi-year educational program centered on inclusive leadership training and accountability that is designed to impact each of our employees, and by diversifying our talent sourcing practices to develop, advance and retain a diverse employee population. Additionally, we are investing in internal business resource groups to support our company's cultural values, drive our business initiatives forward, meet the needs of both internal and external stakeholders, and foster our commitment to build an inclusive and diverse work environment. Management's continued objectives in IDE include reinforcing inclusive behaviors at all levels of our organization, evaluating and mitigating bias in the talent lifecycle in an effort to enhance the recruiting, hiring, development and retention of women, people of color, and other underrepresented groups, and continuing to focus on our internal business resource groups to promote belonging, equity and the importance of allyship.

Accountability for IDE has been established by incorporating Board oversight of IDE, as part of our larger corporate culture, into the charter of the Compensation and Human Capital Committee of the Board of Directors ("CHCC") and by including support of and progress on IDE initiatives as part of the incentive compensation evaluation process for our CEO and entire executive leadership team.

Engagement and Alignment with Company Culture

We believe that an employee workforce that is engaged and aligned with our core cultural values of collaboration, accountability, respect and empowerment (our CARE values) is fundamental to delivering on our business commitments. Management focuses on maintaining an engaged workforce by providing transparent communications and soliciting employee feedback informally and through focus groups and employee surveys, including a comprehensive survey of our entire workforce conducted in 2021, with a second survey planned for later this year, by an independent third-party firm. To foster accountability, every employee, regardless of role, receives a formal evaluation and performance discussion annually, and the evaluation process is aligned to our CARE values and expected leadership behaviors. In addition, we expect that performance connections take place between manager and employee on an ongoing basis to consider goals, overall performance, development opportunities, and demonstration of leadership and corporate values.

Development and Succession Planning

We recognize the importance of employee development for our team members throughout their careers as an important driver of workforce engagement, retention, and succession planning. Management focuses on providing learning and development through multiple modalities, including utilizing a robust online learning management platform that accommodates various schedules and diverse learning styles, engaging in experiential learning through growth assignments and special projects, using virtual and classroom workshops, providing reimbursement for tuition and education-related fees (including professional and industry designations), and through the course of our goal-setting and performance evaluation process.

We are committed to identifying and investing in the development of our future leaders and accomplish this through formal talent review and succession planning processes that are aligned to standard leadership capabilities and our critical roles. Our development focus may include 360 feedback assessments, formal leadership development programs, executive coaching and experiential development opportunities for many employees.

Incentivized Workforce

The emphasis on our overall performance is intended to align the employee's financial interests with the interests of shareholders. Our compensation philosophy is based on a merit system where employees are paid for their performance and recognized for their talents and contributions. We are committed to fair and equitable total compensation that includes base pay and short- and long-term incentives that are competitive with others in our industry, while also promoting internal equity across our organization. We offer a 401(k) plan with a company matching contribution, flexible paid time off policies, an employee stock purchase program, retirement planning services, and health and wellness benefits described below, among other benefits. Most employees receive short-term incentive compensation based on annual goals with the funding and metrics approved by the CHCC. Additionally, our senior leaders receive long-term incentive compensation in the form of equity awards.

Employee Health and Wellness

Our benefits packages are designed to maintain the physical, financial, mental and social well-being of our employees, their families and dependents. We offer medical plan selections and other health and wellness offerings, including, among others, dental, vision and hearing health options, life and disability insurance, an employee assistance program, paid parental leave and family and medical leave, flexible work schedules and remote work arrangements, health advocacy services, adoption assistance benefit, and child care and elder care support.

We have transitioned to a fully hybrid work environment that provides flexibility based on business needs and that serves as a strong lever for employee engagement and retention. We have implemented measures intended to enhance operational efficiencies related to remote work such as investing in our technology and business continuity infrastructure.

EXECUTIVE OFFICERS OF THE REGISTRANT

Reference is made to "Directors, Executive Officers and Corporate Governance" in Part III - Item 10.

AVAILABLE INFORMATION

We file our annual report on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, our definitive proxy statement on Schedule 14A, and other required information with the SEC. Shareholders may obtain reports, proxy and information statements, and other information with respect to our filings, at the SEC's website, https://www.sec.gov.

Our website address is https://www.hanover.com. We make available, free of charge, on or through our website, our annual report on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, and amendments to those reports filed or furnished pursuant to Sections 13(a) or 15(d) of the Securities Exchange Act of 1934, as soon as reasonably practicable after we electronically file such material with, or furnish it to, the SEC. Our Code of Conduct is also available, free of charge, on our website. Additionally, our Corporate Governance Guidelines and the charters of our Audit Committee, Compensation and Human Capital Committee, Committee of Independent Directors, and Nominating and Corporate Governance Committee, are available on our website. All documents are also available in print to any shareholder who requests them. Unless specifically incorporated by reference, information on our website is not part of this Annual Report on Form 10-K.

ITEM 1A–RISK FACTORS

RISK FACTORS AND FORWARD-LOOKING STATEMENTS

The following important factors, among others, in some cases have affected, and in the future could affect, our actual results and could cause our actual results to differ materially from historical results and from those expressed in any forward-looking statements made from time to time by us on the basis of our then-current expectations. The words "believes," "anticipates," "expects," "projections," "outlook," should," "could," "plan," "guidance," "likely," "on track to," "targeted" and similar expressions are intended to identify forward-looking statements. Our businesses are in rapidly changing and competitive markets, and involve a high degree of risk and unpredictability. Forward-looking projections are subject to these risks and unpredictability.

Risks Related to Underwriting, Risk Aggregation and Risk Management

Our results may fluctuate as a result of cyclical or non-cyclical changes in the property and casualty insurance industry.

The property and casualty insurance industry historically has been subject to significant fluctuations and uncertainties. Our profitability is materially affected by the following items:

- increases in costs, particularly increases occurring after the time our insurance products are priced, including construction, automobile repair, and medical and rehabilitation costs. This includes inflation, rises in the cost of products due to disruptions in supply chains, tariffs or other factors and "cost shifting" from health insurers to casualty and liability insurers (whether as a result of injured parties without health insurance, coverage changes in health policies to make such coverage secondary to casualty policies, state or federal healthcare legislation, lower reimbursement rates by health insurers or government-sponsored insurance, or legislation and/or litigation related to the Medicare Secondary Payer Act, which may impose reporting, additional costs, and other requirements with respect to medical and related claims paid for Medicare eligible individuals). As it relates to construction, there are often increases in the cost of building supplies and construction labor after a significant event (for example, so called "demand surge" that causes the cost of labor, construction materials and other items to increase in a geographic area affected by a catastrophe). In addition, we are limited in our ability to negotiate and manage reimbursable expenses incurred by our policyholders;
- competitive and regulatory pressures, which affect the prices of our products and the nature of the risks covered;
- volatile and unpredictable developments, including severe weather, catastrophes, wildfires, infrastructure failure, civil unrest, pandemics and terrorist actions;
- legal, regulatory and socio-economic developments, such as new theories of insured and insurer liability and related claims and extra-contractual awards such as punitive damages, financed litigation, where a third party unrelated to a lawsuit provides capital to a plaintiff in return for a portion of any financial recovery from the lawsuit, and "social inflation" or other increases in the costs of litigation, size of jury awards or changes in applicable laws and regulations (such as changes in the thresholds affecting "no fault" liability or when non-economic damages are recoverable for bodily injury claims or coverage requirements) that impact our claim payouts;
- fluctuations in interest rates, as a result of a change in monetary policy or otherwise, inflationary pressures, default rates, commodity prices, and other factors that affect net income, including with respect to investment returns and operating results for certain of our lines of business; and
- other general economic conditions and trends that may affect the adequacy of reserves.

The demand for property and casualty insurance can also vary significantly based on general economic conditions (either nationally or regionally), rising as the overall level of economic activity increases and falling as such activity decreases. Loss patterns also tend to vary inversely with local economic conditions, increasing during difficult or unstable economic times and moderating during economic upswings or periods of stability. The COVID-19 Pandemic introduced additional, persistent complexity to loss patterns. The fluctuations in demand and competition could produce unpredictable underwriting results.

Due to geographical concentration in our business, changes in economic, regulatory and other conditions in the regions where we operate could have a significant negative impact on our business as a whole. Geographic concentrations also expose us to losses that are potentially disproportionate to our market share in the event of natural or other catastrophes.

We generate a significant portion of our net premiums written and earnings in Michigan, Massachusetts and other states in the Northeast. In addition, a significant amount of Core Commercial and Specialty net written premium is generated in California and Texas. For the year ended December 31, 2022, approximately 19.7% and 8.6% of our net premiums written in our business were generated in the states of Michigan and Massachusetts, respectively, and approximately 11.5% and 7.9% of our Core Commercial and approximately 12.6% and 9.7% of our Specialty net premiums written were generated in California and Texas, respectively. Many states in which we do business impose significant rate control and residual market charges and restrict an insurer's ability to exit such markets (for example, the Insurance Commissioner in California has taken steps to limit non-renewal of property policies in geographic areas prone to wildfires). The revenues and profitability of our insurance subsidiaries are subject to prevailing economic, regulatory, demographic and other conditions, including adverse weather. Because of our geographic concentration in certain regions, our business, as a whole, could be significantly affected by changes in the economic, regulatory and other conditions in such areas.

Further, certain new catastrophe models assume an increase in frequency and severity of certain weather or other events, such as fires, flooding from heavy precipitation and hurricanes, as a result of changing weather patterns and global climate change, or otherwise. Financial strength rating agencies emphasize capital and reinsurance adequacy for insurers with geographic concentrations of risk that may be subject to disproportionate risk of loss. These factors also may result in insurers seeking to diversify their geographic exposure, which could result in increased regulatory restrictions in those markets where insurers seek to exit or reduce coverage, as well as an increase in competitive pressures in less weather-exposed markets.

Our profitability may be adversely affected if our pricing models differ materially from actual results.

The profitability of our business depends on the extent to which our actual claims experience is consistent with the assumptions we use in pricing our policies. We price our business in a manner that is intended to be consistent, over time, with actual results and return objectives. Our estimates and models, and/or the assumptions behind them, may differ materially from actual results. Highly dynamic economic, social, regulatory or environmental conditions, in isolation or in combination, may impact the effectiveness of our pricing models.

If we fail to appropriately price the risks we insure, fail to change or are slow to change our pricing model to appropriately reflect our current experience, or if our claims experience is more frequent or severe than our underlying risk assumptions, our profit margins will be negatively affected. If we underestimate the frequency and/or severity of extreme adverse events, our financial condition may be adversely affected. If we overestimate the risks we are exposed to, we may overprice our products, and new business growth and retention of our existing business may be adversely affected.

Our business is dependent on our ability to manage risk, and the failure of the risk mitigation strategies we utilize could have a material adverse effect on our financial condition or results of operations.

Our business performance is highly dependent on our ability to manage operational risks arising from numerous day-to-day business activities, including insurance underwriting, claims processing, servicing, investment, financial and tax reporting, compliance with regulatory requirements and other activities. We utilize numerous strategies to mitigate our insurance risk exposure, including: underwriting; setting exposure limits, deductibles and exclusions to mitigate policy risk; updating and reviewing the terms and conditions of our policies; managing risk aggregation by product line, geography, industry type, credit exposure and other bases; and ceding insurance risk. We seek to monitor and control our exposure to risks arising out of these activities through an enterprise-wide risk management framework. However, there are inherent limitations in each of these tactics, and no assurance can be given that these processes and procedures will effectively control all known risks or effectively identify unforeseen risks, or that an event or series of events will not result in loss levels in excess of our probable maximum loss models, which could have a material adverse effect on our financial condition or results of operations. It is also possible that losses could manifest themselves in ways that we do not anticipate and that our risk mitigation strategies are not designed to address. Such a manifestation of losses could have a material adverse effect on our financial condition or results of operations. These risks may be heightened during times of challenging macroeconomic or sociopolitical conditions, such as a recession.

Risks Related to Reserves and Claims

Actual losses from claims against our insurance subsidiaries may exceed their reserves for claims.

We maintain reserves to cover the estimated ultimate liability for losses and loss adjustment expenses with respect to reported and unreported claims incurred as of the end of each accounting period. Reserves do not represent an exact calculation of liability. Rather, reserves represent estimates, involving actuarial projections and judgments at a given time, of what we expect the ultimate settlement and administration of incurred claims will cost based on facts and circumstances then known, predictions of future events, estimates of future trends in claims frequency and severity and judicial theories of liability, costs of repair and replacement, legislative activity and myriad other factors.

The inherent uncertainties of estimating reserves are greater for certain types of insurance lines, particularly liability lines. These include automobile bodily injury liability, automobile personal injury protection, general liability, and workers' compensation, where a longer period of time may elapse before a definitive determination of ultimate liability may be made (sometimes referred to as "long-tail" business), environmental liability, where the technological, judicial and political climates involving these types of claims are continuously evolving, and casualty coverages such as professional liability. The emergence of the Pandemic in 2020 resulted in an increased level of uncertainty for many lines of business, particularly our long-tailed lines. There is also greater uncertainty in establishing reserves with respect to new business, particularly new business that is generated with respect to newer product lines, such as our cyber-risk lines and specialty general liability product, by newly appointed agents, or in new geographies where we have less experience in conducting business. In these cases, there is less historical experience or knowledge and less data that the actuaries can rely on. A combination of business that is both new to us and has longer development periods, provides even greater uncertainty in estimating insurance reserves.

In several Specialty lines, we are modestly increasing, and expect to continue to increase, our exposure to longer-tailed liability lines. In addition, we have experienced extensions of the "tails" in certain lines of business as the full value of claims are presented later than had been our historical experience. The broad impact of the Pandemic on the claims environment has extended these "tails" even further. Also, presumptive orders by state authorities have potentially increased workers' compensation exposures beyond contractual obligations. Additionally, shifts in claim settlement patterns due to delayed court proceedings and other issues, contribute to the extension of "tails," increased loss costs and greater uncertainty in reserve estimates.

Estimating reserves is further complicated by unexpected claims or unintended coverages that emerge due to changing conditions. These emerging issues may increase the size or number of claims beyond our underwriting intent and may not become apparent for many years after a policy is issued, such as was the case for the industry with respect to environmental, asbestos, and certain product liability claims. Similar concerns have emerged with what has been called "silent" cyber, or claims arising for cyber losses under traditional policies where such coverage is not intended or contemplated. These losses appear through prior year reserve development. Although we undertake underwriting actions that are designed to limit losses once emerging issues are identified, we remain subject to losses on policies issued during those years preceding the underwriting actions.

Additionally, the introduction of new Core Commercial products and the development of new niche and Specialty lines present new risks. Certain Specialty products, such as the human services program, non-profit directors and officers liability and employment practices liability policies, lawyers and other professional liability policies, healthcare lines and directors and officers coverage may also require a longer period of time (the so-called "tail") to determine the ultimate liability associated with the claims and may produce more volatility in our results and less certainty in our accident year reserves. Some lines of business, such as surety, are less susceptible to establishing reserves based on actuarial or historical experience, and losses may be episodic, depending on economic and other factors. Changes in laws, such as so-called "reviver" statutes that retrospectively change the statutes of limitations for certain claims, such as sexual molestation claims, add further uncertainty to the adequacy of prior estimates.

Underwriting results and operating income could be adversely affected by further changes in our net loss and LAE estimates related to significant events or emerging risks, such as risks related to attacks on or breaches of cloud-based data information storage or computer network systems ("cyber-risks"), privacy compliance, or disruptions caused by major power grid failures or widespread electrical and electronic equipment failure due to aging infrastructure, natural factors like hurricanes, earthquakes, wildfires, solar flares and pandemic or societal factors, like terrorism and civil unrest.

Estimating losses following any major catastrophe, or with respect to emerging claims, is an inherently uncertain process. Factors that add to the complexity of estimating losses from these events include legal and regulatory uncertainty, the complexity of factors contributing to the losses, delays in claim reporting, and with respect to areas with significant property damage, the impact of "demand surge" and a slower pace of recovery resulting from the extent of damage sustained in the affected areas due, in part, to the availability and cost of resources to effect repairs. Emerging claims issues may involve complex coverage, liability and other costs that could significantly affect LAE. As a result, there can be no assurance that our ultimate costs associated with these events will not be substantially different from current estimates (for example, actual losses arising from an event could have varied widely depending on the interpretation of various policy provisions). Investors should consider the risks and uncertainties in our business that may affect net loss and LAE reserve estimates and future performance, including the difficulties in arriving at such estimates.

Anticipated losses associated with business interruption exposure, the impact of wind versus water as the cause of loss, disputes over the extent of damage caused by hailstorms (particularly with respect to roof damage claims), supplemental payments on previously closed claims caused by the development of latent damages or new theories of liability, regulatory impacts and inflationary pressures leading to claims cost escalation could also have a negative impact on future loss reserve development. Many states permit insureds to simply sign-over their claims to contractors or others (so-called "assignment of benefits"), which frequently generate higher claim demands.

Because of the inherent uncertainties involved in setting reserves and establishing current and prior-year "loss picks," including those related to catastrophes, we cannot provide assurance that the existing reserves or future reserves established by our insurance subsidiaries will prove adequate in light of subsequent events. Our results of operations and financial condition have in the past been, and in the future could be, materially affected by adverse loss development for events that we insured in prior periods.

Risks Related to Weather Events, Catastrophes and Climate Change

Limitations on the ability to predict the potential impact of weather events and catastrophes may impact our future profits and cash flows.

Our business is subject to claims arising out of catastrophes that may have a significant impact on our results of operations and financial condition. We have experienced, and in the future will experience catastrophe losses, which could have a material adverse impact on our business. Catastrophes can be caused by various events, including hurricanes, floods, earthquakes, tornadoes, wind, hail, fires, drought, severe winter weather, volcanic eruptions, tropical storms, tsunamis, sabotage, civil unrest, terrorist actions, explosions, nuclear accidents, solar flares, and power outages, which could be exacerbated by infrastructure failures. The frequency and severity of catastrophes are inherently unpredictable.

The extent of gross losses from a catastrophe is a function of the total amount of insured exposure in the area affected by the event and the severity of the event. The extent of net losses depends on the applicability, amount and collectability of reinsurance.

Additionally, the severity of certain catastrophes could be so significant that it restricts the ability of certain locations to recover their economic viability in the near term. Repeated catastrophes, or the threat of catastrophes, could undermine the long-term economic viability of certain locations like coastal or wildfire-exposed communities, which could have a significant negative impact on our business.

Although catastrophes can cause losses in a variety of property and casualty lines, homeowners and commercial multiple peril property insurance have, in the past, generated the vast majority of our catastrophe-related claims. Our catastrophe losses have historically been principally weather-related, particularly from hurricanes and hail damage, as well as snow and ice damage from winter storms.

Although the insurance industry and rating agencies have developed various models intended to help estimate potential insured losses under thousands of scenarios, there is no reliable way of predicting the probability of such events or the magnitude of such losses before a specific event occurs. We utilize various models and other techniques in an attempt to measure and manage potential catastrophe losses within various income and capital risk appetites. However, such models and techniques have many limitations, and changes in climate conditions may also cause our historical underlying modeling data to not adequately reflect the frequency and severity of weather-related events in the future, limiting our ability to effectively evaluate and manage risks of catastrophes and severe weather events. In addition, due to historical concentrations of business, regulatory restrictions and other factors, our ability to manage such concentrations is limited, particularly in the Northeast, and in the state of Michigan.

We purchase catastrophe reinsurance as protection against catastrophe losses. Reinsurance is subject to the adequacy and counterparty reinsurance risks described below. Should we experience losses from one significant or several large catastrophes, there can be no assurance that our reinsurance program will provide adequate coverage levels.

Climate change may adversely impact our results of operations and/or our financial position.

Global climate change from rising planet temperatures over the last several decades has been linked to a number of factors that contribute to the increased unpredictability, frequency, duration and severity of weather events, including: changing weather patterns, a rise in ocean temperatures, and sea level rise. Further increases or persistence in these conditions could lead to higher overall losses, which we may not be able to recoup, particularly in a highly regulated and competitive environment, and higher reinsurance costs. Certain catastrophe models assume an increase in frequency and severity of certain weather or other events, which could result in a disproportionate impact on insurers with certain geographic concentrations of risk. This would also likely increase the risks of writing property insurance in coastal areas or areas susceptible to wildfires or flooding, particularly in jurisdictions that restrict pricing and underwriting flexibility. The threat of rising seas or other catastrophe losses as a result of global climate change may also cause property values in coastal or such other communities to decrease, reducing the total amount of insurance coverage that is required.

In addition, global climate change and global climate change-driven systemic transitions could lead to new or enhanced regulation, which may be difficult or costly with which to comply, or impact assets in which we invest, and may result in realized and unrealized losses in future periods that could have a material adverse impact on our results of operations and/or financial position. It is not possible to foresee the impacts of potential future climate regulation, or which, if any, assets, industries or markets may be materially and adversely affected by global climate change and global climate change-driven systemic transitions, nor is it possible to foresee the magnitude of such effects.

Risks Related to Reinsurance

We cannot guarantee the adequacy of or ability to maintain our current level of reinsurance coverage.

Like insurance companies, reinsurance companies can also be adversely impacted by catastrophes. In setting our retention levels and coverage limits, we consider our level of statutory surplus and exposures, as well as the current reinsurance pricing environment and available capacity, but there can be no assurance that we adequately set these levels or limits or that we will be able to maintain our current or desired levels of reinsurance coverage. In particular, and as discussed under "Reinsurance Program Overview" in Information About Operating Segments - Reinsurance, not all of our 2023 reinsurance programs for the Core Commercial, Specialty and Personal Lines are fully placed. Reinsurance is a significant factor in our overall cost of providing primary insurance. However, unlike primary insurers, reinsurers are not subject to rate or other restrictions requiring them to continue availability of reinsurance or limiting cost increases or mandating coverage forms. An individual insurer's reinsurance expense is correlated to the level of losses experienced by its reinsurers. Future catastrophic events and other changes in the reinsurance marketplace, including as a result of investment losses or disruptions due to challenges in the financial markets that have occurred or could occur in the future, may adversely affect our ability to obtain such coverages, as well as adversely affect the cost of obtaining that coverage.

Additionally, the availability, scope of coverage, cost, and creditworthiness of reinsurance could continue to be adversely affected by new or more frequent catastrophes, terrorist attacks, cyber-risks, and the perceived risks associated with future terrorist activities, global conflicts, including the threat of nuclear conflict, and the changing legal and regulatory environment (including changes that could create new insured risks). Federal reinsurance for terrorism risks coverage offered by insurers is available under the federal terrorism risk insurance program, but it only applies to certified events of terrorism (as defined in the legislation) and contains certain caps and deductibles. Although the federal terrorism risk insurance program coverage is in effect through December 31, 2027, if this program is modified unfavorably by the government in the future, then private reinsurance for events of terrorism may not be available to us or available at reasonable or acceptable rates.

Although we monitor their financial soundness, we cannot be sure that our reinsurers will pay in a timely fashion, if at all.

We purchase reinsurance by transferring (known as ceding) part of the risk that we have assumed to reinsurance companies in exchange for part of the premium we receive in connection with the risk. As of December 31, 2022, our reinsurance receivable (including from the MCCA) amounted to approximately $2.0 billion. Although reinsurance makes the reinsurer liable to us to the extent the risk is transferred or ceded to the reinsurer, it does not relieve us (the reinsured) of our liability to our policyholders. Accordingly, we bear counterparty risk with respect to our reinsurers, including risks resulting from over-concentration of exposures within the industry. Although we monitor our reinsurers and their financial condition, we cannot be sure that they will pay the reinsurance recoverables owed to us currently or in the future or that they will pay such recoverables on a timely basis. The contractual obligations under reinsurance agreements are typically with individual subsidiaries of the reinsurance group and are not typically guaranteed by other group members. In certain circumstances, with "unauthorized" reinsurers or those with lower financial strength ratings, we may require collateral equal to 100% of estimated reinsurance recoverables. The collateral can serve to mitigate credit risk. In the event of losses, we may look to "draw down" on this collateral to satisfy reinsurance recoveries due to us, but if the collateral held is insufficient to meet those recoveries, we will be exposed to losses.

Risks Related to Regulation, Mandatory Market Mechanisms and Mandatory Assessments

Our businesses are heavily regulated, and changes in regulation may reduce our profitability.

Our insurance businesses are subject to supervision and regulation by the state insurance authority in each state where we transact business. This system of supervision and regulation relates to numerous aspects of an insurance company's business and financial condition, including limitations on the authorization of lines of business, underwriting limitations, the ability to utilize credit-based insurance scores, gender, geographic location, information publicly available (such as on social media), education, occupation, income or other factors in underwriting, the ability to terminate agents, supervisory and liability responsibilities for agents, the setting of premium rates, the requirement to write certain classes of business that we might otherwise avoid or charge different premium rates, restrictions on the ability to withdraw from certain lines of business or terminate policies or classes of policyholders, the establishment of standards of solvency, the licensing of insurers and agents, compensation of and contractual arrangements with independent agents, concentration of investments, levels of reserves, the payment of dividends, transactions with affiliates, changes of control, protection of private information of our agents, policyholders, claimants and others (which may include highly sensitive financial or medical information or other private information such as social security numbers, driving records or driver's license numbers) and the approval of policy forms. From time to time, various states and Congress have proposed to prohibit or otherwise restrict the use of credit-based insurance scores or other risk-based pricing factors in underwriting or rating our Personal Lines business. The elimination of the use of risk-based pricing factors could cause significant disruption to our business and our confidence in our pricing and underwriting. Most insurance regulations are designed to protect the interests of policyholders rather than stockholders and other investors.

Legislative and regulatory restrictions are constantly evolving and are subject to then-current political pressures. For example, following major events, states have considered, and in some cases adopted, proposals such as homeowners' "Bill of Rights," restrictions on storm deductibles, additional mandatory claim handling guidelines and mandatory coverages. More recently, the California Insurance

Commissioner restricted the ability of carriers to non-renew certain coverages in wildfire disaster areas, and the New York Department of Financial Services and regulatory agencies in other states have enacted comprehensive cybersecurity regulations and required insurers to take steps related to global climate change.

Also, the federal Medicare, Medicaid and State Children's Health Insurance Program Extension Act mandates reporting and other requirements applicable to property and casualty insurance companies that make payments to or on behalf of claimants who are eligible for Medicare benefits. These requirements have made bodily injury claim resolutions more difficult, particularly for complex matters or for injuries requiring treatment over an extended period, and they impose significant penalties for non-compliance and reporting errors. These requirements also have increased the circumstances under which the federal government may seek to recover from insurers amounts paid to claimants in circumstances where the government had previously paid benefits.

State regulatory oversight and various proposals at the federal level, through the Federal Insurance Office or other agencies, may, in the future, adversely affect our ability to sustain adequate returns in certain lines of business or in some cases, operate lines profitably. In recent years, the state insurance regulatory framework has come under increased federal scrutiny, and certain state legislatures have considered or enacted laws that alter and, in many cases, increase state authority to regulate insurance companies and insurance holding company systems.

Our business could be negatively impacted by adverse state and federal legislation or regulation, or judicial developments, including those resulting in: decreases in rates, including for example, recent regulatory or bureau actions to mandate reduced premiums for workers' compensation insurance; limitations on premium levels or limitations that inhibit our ability to secure timely approvals of rate filings; coverage and benefit mandates; limitations on the ability to manage care and utilization or other claim costs; requirements to write certain classes of business or in certain geographies; restrictions on underwriting, methods of compensating independent producers, or our ability to cancel or renew certain business (which negatively affects our ability to reduce concentrations of property risks); higher liability exposures for our insureds; increased assessments or higher premium or other taxes; and enhanced ability to pierce "no fault" thresholds, recover non-economic damages (such as "pain and suffering"), or pierce policy limits.

These regulations serve to protect customers and other third parties and are often heavily influenced by the then-current political environment. If we are found to have violated an applicable regulation, administrative or judicial proceedings may be initiated against us that could result in censures, fines, civil penalties (including punitive damages), the issuance of cease-and-desist orders, premium refunds or the reopening of closed claim files, among other consequences. These actions could have a material adverse effect on our financial position and results of operations.

In addition, we are reliant upon independent agents and brokers to market our products. Changes in regulations related to insurance agents and brokers that materially impact the profitability of the agent and broker business or that restrict the ability of agents and brokers to market and sell insurance products would have a material adverse effect on our business.

Further, as we continue to expand our business into new regions, either organically or through acquisition, we become subject to the regulations and different regulatory bodies governing such business in those locales.

From time to time, we are also involved in investigations and proceedings by federal, state, and other governmental and self-regulatory agencies. We cannot provide assurance that these investigations, proceedings and inquiries will not result in actions that would adversely affect our results of operations or financial condition.

We are subject to uncertainties related to Michigan PIP Reform.

Starting in 1973, the state of Michigan required all personal and commercial automobile polices issued in the state to include no-fault personal injury protection ("PIP") coverage without a cap on maximum benefits allowed (i.e., "unlimited PIP benefits"). Insurers were required to retain a portion of the risk and the MCCA, a legislatively-created reinsurance mechanism, reinsures the portion of the risk in excess of the insurer's mandated retention. The mandatory retention amount increases biennially at a statutory mandated rate and is currently $600,000. Premiums on Michigan automobile policies include a charge for both the insurer's retained amount and a separately identified pass-through charge determined by the MCCA.

In response to concerns about the overall cost and affordability of automobile insurance in Michigan, the state enacted legislation in June 2019 that significantly changed no-fault and PIP systems. The legislation, effective July 2, 2020, eliminated the requirement that all insureds purchase unlimited PIP coverage and substituted instead tiered limits, ranging from zero (for those with certain health benefits meeting specified criteria) to unlimited benefits. In contrast, the minimum amounts of bodily injury coverage drivers are required to purchase increased, and we anticipate an increase in tort liability and related litigation from these changes. The legislation includes underwriting and other restrictions and mandates, in addition to subjecting rates, forms and rules to prior approval from the Michigan Department of Insurance and Financial Services ("Michigan Insurance Department") before implementation.

The legislation also imposes various cost controls, including medical fee schedules based on a multiple of Medicare reimbursement rates, and mandated PIP premium rate reductions with an eight-year premium rate freeze for the PIP component of automobile policies. The Michigan Insurance Department also enacted regulations to establish statutorily required utilization controls. The rate freeze was effective contemporaneously with the adoption of the legislation and the mandatory rate reduction was effective July 2, 2020, and the expense and utilization controls went into effect on July 1, 2021.

In most years, MCCA operates with a deficit, which may fluctuate significantly based on investment returns, discount rates, incurred claims, annual assessments and other factors, although historically its annual operations have been cash flow positive. As of December 31, 2022, our estimated reinsurance recoverable from the MCCA was $883.0 million. This estimate is subject to change and will be revised further as the actual impacts of these cost saving measures emerge in the future, or in the event recent legal challenges to the reform ultimately prevail.

Many medical and other providers who receive reimbursement under the PIP system strenuously objected to the fee schedules, cost controls and utilization restrictions imposed by the new legislation. Since the reform legislation was adopted, we have experienced an increase in litigation from medical and other providers demanding higher reimbursements under the current system, and that litigation could increase depending on the outcome of the ongoing legal challenges. On October 3, 2019, litigation captioned Andary et. al. v. USAA Casualty Insurance Company and Citizens Insurance Company of America (a subsidiary of THG), Circuit Court for the County of Ingham, Michigan Case 19-738-CZ, was filed. The plaintiffs seek a declaratory judgment that the fee schedules, attendant care reimbursement limits, cost controls and utilization review provisions of the new legislation violate multiple provisions of the Michigan state constitution. We continue to vigorously contest plaintiffs' claims.

For the year ending December 31, 2022, Michigan personal automobile insurance represented approximately 45% of our total personal automobile net premiums written. PIP net written premium (which does not include the MCCA pass-through assessment) represents approximately 24% of those Michigan personal automobile premiums. It is not clear at this time whether projected savings from the various cost control measures, assuming they remain in effect, will be commensurate with the required PIP reductions and rate controls. Accordingly, there is increased uncertainty attributable to these changes regarding the future performance of our Michigan personal automobile lines.

We may incur financial losses resulting from our participation in shared market mechanisms, mandatory reinsurance programs and mandatory and voluntary pooling arrangements.

In most of the jurisdictions that we operate in, our insurance subsidiaries are required to participate in mandatory property and casualty shared market mechanisms, government-sponsored reinsurance programs or pooling arrangements. These arrangements are designed to provide various insurance coverages to individuals or other entities that are otherwise unable to purchase such coverage or to support the costs of uninsured motorist claims in a particular state or region. We cannot predict whether our participation in these shared market mechanisms or pooling arrangements will provide underwriting profits or losses to us. For the years ended December 31, 2022, 2021 and 2020 our participation in these mechanisms and pooling arrangements was not significant to our underwriting results. However, our results of operations could be adversely affected in the future**.**

Additionally, increases in the number of participants or insureds in state-sponsored reinsurance pools, FAIR plans or other residual market mechanisms, particularly in the states of Massachusetts, Texas, California, New York, or North Carolina, combined with regulatory restrictions on the ability to adequately price, underwrite, or non-renew business, as well as new legislation, or changes in existing case law, could expose us to significant risks of increased assessments from these residual market mechanisms. There could also be a significant adverse impact as a result of losses incurred in those states due to hurricane or other high loss exposures, as well as the declining number of carriers providing coverage in those regions. We are unable to predict the likelihood or impact of such potential assessments or other actions.

We also have credit risk associated with certain mandatory reinsurance programs, such as the MCCA. See "We are subject to uncertainties related to Michigan PIP Reform," above for more information on the MCCA.

In addition, we may be adversely affected by liabilities resulting from our previous participation in certain voluntary property and casualty assumed reinsurance pools. We have terminated our participation in virtually all property and casualty voluntary pools, but we remain subject to claims related to the periods when we participated. The property and casualty industry's assumed reinsurance businesses have suffered substantial losses during the past several years, particularly related to environmental and asbestos exposure for property and casualty coverages, in some cases resulting from incidents alleged to have occurred decades ago. Due to the inherent volatility in these businesses, possible issues related to the enforceability of reinsurance treaties in the industry and the continuing history of increased losses, we cannot provide assurance that our current reserves are adequate or that we will not incur losses in the future. Our operating results and financial position may be adversely affected by liabilities resulting from any such claims in excess of our loss estimates. As of December 31, 2022, our gross reserves totaled $38.9 million for these legacy voluntary property and casualty assumed reinsurance pools, with the largest being the Excess Casualty Reinsurance Association ("ECRA") pool. During 2021, we entered into a reinsurance agreement whereby we agreed to cede 100% of the ECRA business to a third-party reinsurer. The ECRA business represents approximately 88% of our 2022 gross reserves for these legacy voluntary pools.

We are subject to mandatory assessments by state guaranty funds; an increase in these assessments could adversely affect our results of operations and financial condition.

All fifty U.S. states and the District of Columbia have insurance guaranty fund laws requiring property and casualty insurance companies doing business within the state to participate in guaranty associations. These associations are organized to pay contractual obligations under insurance policies issued by impaired or insolvent insurance companies. The associations levy assessments, up to prescribed

limits, on all member insurers in a particular state based on the proportionate share of the premiums written by member insurers in the lines of business that the impaired or insolvent insurer is engaged in. Although mandatory assessments by state guaranty funds that are used to cover losses to policyholders of insolvent or rehabilitated companies can be substantially recovered over time through policyholder surcharges or a reduction in future premium taxes in many states (provided the collecting insurer continues to write business in such state), there can be no assurance that all funds will be recoupable in the future. During 2022, we had a total assessment of $4.1 million levied against us, with refunds of $1.6 million received in 2022, for a total net assessment of $2.5 million. As of December 31, 2022, we had $0.3 million of reserves related to guaranty fund assessments. In the future, these assessments may increase above levels experienced in prior years. Future increases in these assessments depend upon the rate of insolvencies of insurance companies.

We are subject to litigation risks, including risks relating to the application and interpretation of contracts, and adverse outcomes in litigation and legal proceedings could adversely affect our results of operations and financial condition.

We are subject to litigation risks, including risks relating to the application and interpretation of insurance and reinsurance contracts and our handling of claim matters (which can lead to bad faith and other forms of extra-contractual liability), and are routinely involved in litigation that challenges specific terms and language incorporated into property and casualty contracts, such as claims reimbursements, covered perils and exclusion clauses, among others, or the interpretation or administration of such contracts, including with respect to Pandemic-related litigation. We are also involved in legal actions that do not arise in the ordinary course of business, some of which assert claims for substantial amounts. Adverse outcomes could materially affect our results of operations and financial condition.

Risks Related to Our Agency Distribution and Growth Strategies

Our profitability could be adversely affected by our relationships with our agencies.

Substantially all of our products are distributed through independent agents and brokers who have the principal relationships with policyholders. Agents and brokers generally own the "renewal rights," and thus our business model is dependent on our relationships with, and the success of, the agents and brokers with whom we do business.

We periodically review the agencies, including managing general agencies, with whom we do business to identify those that do not meet our profitability standards or are not aligned with our business objectives. Following these periodic reviews, we may restrict such agencies' access to certain types of policies or terminate our relationship with them, subject to applicable contractual and regulatory requirements that limit our ability to terminate agents or require us to renew policies. Even through the utilization of these measures, we may not achieve the desired results.

Because we rely on independent agents as our sales channel, any deterioration in the relationships with our independent agents or failure to provide competitive compensation to our independent agents could lead agents to place more premium with other carriers and less premium with us. In addition, we could be adversely affected if the agencies with whom we do business, including managing general agencies, exceed the authority that we have given them, fail to transfer collected premium to us or breach the obligations that they owe to us. Although we routinely monitor our agency relationships, such actions could expose us to liability.

Also, if agency consolidation continues at its current pace or increases in the future and more agencies are consolidated into larger agencies or managing general agencies, our sales channel could be materially affected in a number of ways, including loss of market access or market share in certain geographic areas if an acquirer is not one of our appointed agencies, loss of agency talent as the people most knowledgeable about our products and with whom we have developed strong working relationships exit the business following a disposition of an agency, increases in our commission costs as larger agencies acquire more negotiating leverage over their fees, and interference with the core agency business of selling insurance due to integration or distraction. Any such disruption that materially affects our sales channel could have a negative impact on our results of operations and financial condition.

As the speed of digitization accelerates, we are subject to risks associated with both our agents' and our ability to keep pace. In an increasingly digital world, agents who cannot provide a digital or technology-driven experience risk losing customers who demand such an experience, and such customers may choose to utilize more technology-driven agents or abandon the independent agency channel altogether. Additionally, if we are not able to keep pace with competitors' digital offerings, we may not be able to meet the demand from our agents or their customers, which could lead to a loss of customers, agents or both.

We may not be able to grow as quickly or as profitably as we intend, which is important to our current strategy.

Over the past several years, we have made, and our current plans are to continue to make, significant investments in our Core Commercial, Specialty and Personal Lines of businesses, in order to, among other things, strengthen our product offerings and service capabilities, expand into new geographic areas, improve technology and our operating models, build expertise in our personnel, and expand our distribution capabilities, with the ultimate goal of achieving significant, sustained growth. The ability to achieve significant profitable premium growth in order to earn adequate returns on such investments and expenses, and to grow further without proportionate increases in expenses, is an important part of our current strategy. There can be no assurance that we will be successful at profitably growing our business, or that we will not alter our current strategy due to changes in our markets, economic conditions or an inability to successfully maintain acceptable margins on new or existing business or for other reasons, including general economic conditions, because of the Pandemic or otherwise, in which case premiums written and earned, operating income and net book value could be adversely affected.

We may be affected by disruptions caused by the introduction of new products, related technology changes, and new operating models in our Core Commercial, Specialty, and Personal Lines businesses, and future acquisitions, and expansion into new geographic areas.

There are increased underwriting risks associated with premium growth and the introduction of new products or programs in our Core Commercial, Specialty and Personal Lines businesses. Additionally, there are increased underwriting risks associated with the appointment of new agencies and managing general agencies and with the expansion into new geographical areas.

The introduction of new Core Commercial products and the development of new niche and specialty lines presents new risks. Certain new Specialty products may present longer "tail" risks and increased volatility in profitability. Our expansion into new jurisdictions presents additional underwriting risks since the regulatory, geographic, natural risk, legal environment, demographic, business, economic and other characteristics of these states present different challenges from those in the states where we historically have conducted business. In addition, our agency relationships in these new geographies are not as developed.

Our Personal Lines production and earnings may be unfavorably affected by the continued introduction of new products, expanded risk appetites and our focus on account business (i.e., policyholders who have both automobile and homeowner insurance with us) that we believe, despite pricing discounts, will ultimately be more profitable business. We may also experience adverse selection, which occurs when insureds purchase our products because of underpricing, operational difficulties or implementation impediments with independent agents or the inability to grow new markets after the introduction of new products or the appointment of new agents.

As we enter new states or regions or grow our business, there can be no assurance that we will not experience higher loss trends than anticipated.

Risks Related to Technology, Data Security and Privacy

We may experience difficulties with technology, implementing new technologies, data security and/or outsourcing relationships, which could have a negative impact on our ability to conduct our business.

We use computer systems to store, retrieve, evaluate and utilize customer and company data and information. Our computer, information technology and telecommunications systems, in turn, interface with and rely upon third-party systems, including cloud-based data storage. Our business is highly dependent on our ability and the ability of certain third parties, to access these systems to perform necessary business functions, including, without limitation, providing insurance quotes, processing premium payments, making changes to existing policies, filing and paying claims, providing customer support and managing investment portfolios. Systems attacks, failures or outages could compromise our ability to perform these functions in a timely manner, which could harm our ability to conduct business and hurt our relationships with our business partners and customers. In the event of a disaster such as a natural catastrophe, epidemic or pandemic, an industrial accident, a blackout, a computer virus, a cybersecurity attack or intrusion, a terrorist attack or war, or interference from solar flares, our systems or the external systems that we rely on may be inaccessible to our employees, customers or business partners for an extended period of time. Even if our employees are able to report to work, they may be unable to perform their duties for an extended period of time if our data or the systems that we rely on are disabled or destroyed or if our disaster recovery plans are inadequate or suffer from unforeseen consequences. These same risks are ones that our critical third-party vendors may face, and if those vendors are adversely impacted, then our operations could be harmed. This could result in a materially adverse effect on our business results and liquidity.

We increasingly rely on technological and data-driven solutions to operate our business. If we are slow to adapt to, roll out or implement new technologies, particularly those systems, platforms and applications that leverage data and analytics capabilities, it could materially affect our ability to meet the expectations of our customers or compete with more technologically adept competitors, particularly those with greater resources to devote to new technologies or technological enhancements.

In addition, we may increase our reliance upon third-party vendors to access data or to provide or support technology, data storage and business process functions in the future. If we do not effectively develop, implement and monitor our outsourcing and third-party risk management strategies, third-party providers do not perform as anticipated, or we or they experience technological or other problems with a migration or in operations, we may not realize productivity improvements or cost efficiencies and may experience operational difficulties, liabilities for breaches of confidential information, increased costs and a loss of business. Our outsourcing of certain technology, data storage and business process functions to third parties may expose us to enhanced risk related to data security, which could result in monetary and reputational damages. In addition, our ability to receive services from third-party providers outside of the United States might be impacted by global differences in social and cultural expectations, political instability, or substantially different, conflicting or onerous regulatory requirements or policies, which could impact our operational effectiveness. As a result, our ability to conduct our business might be adversely affected.

Data security incidents, including, but not limited to, those resulting from a malicious cybersecurity attack on us or our business partners and service providers, or intrusions into our systems or data sources could disrupt or otherwise negatively impact our business.

Our systems and the systems that we rely on, like others in the financial services industry, are vulnerable to cybersecurity risks, and we are subject to disruption and other adverse effects caused by such activities. Large corporations such as ours are subject to daily attacks

on their systems and other vulnerabilities to data security incidents. These attacks and incidents have included, or may in the future include: unauthorized access, viruses, malware or other malicious code, ransomware, deceptive social engineering campaigns (also known as "phishing" or "spoofing"), loss or theft of assets, employee errors or malfeasance, third-party errors or malfeasance, as well as system failures and other security events. Threat actors who design and commit such attacks may have various goals, from seeking confidential information or the misdirection of payments, to holding systems for ransom, or causing operational disruption. The effects of these activities could result in material disruptions to our operations, financial loss or material damage to our reputation. Like other companies, we have from time to time experienced, and are likely to continue to experience, security events and data intrusion, and while none of these events to date have had a material adverse effect on our business, no assurances can be made that such attacks or security events will not have a material adverse effect on our business in the future. As the breadth, frequency, and complexity of cybersecurity attacks and other data security events become more prevalent and the methods used to perpetrate them evolve, we may be required to devote additional personnel, or financial or systems resources, to protect our Company and invest in additional resources to support our data security program. From time to time we have had to, and in the future we may need to, increase or expend resources to investigate or remediate vulnerabilities as a result of data security incidents. Such resources are costly in time and expense, and detract from resources spent on or are otherwise devoted to our core operations. In addition, depending on the nature of an incident, we may not be able to detect an incident readily, assess its severity or impact, or appropriately respond in a timely manner, which could increase our risk and exposures.

The third parties with whom we work are also subject to these same risks, and we are vulnerable if a cybersecurity attack or other data security incident impacts a third-party vendor or service provider. Such an event could threaten to disrupt our business if the third party's operations are compromised, or provide attackers an opportunity to exploit that compromise to pivot and attack our systems through the technical and operational relationships that we have with our trusted business partners. While we implement measures to protect against such events (e.g., utilizing secure transmission capabilities with third-party vendors and others with whom we do business when possible), including a formal review and assessment of our third-party providers' cybersecurity controls, as appropriate, and modifications to our business processes to manage these risks, we cannot assure that our efforts will always be successful.

Any failure to protect the confidentiality of customer information could adversely affect our reputation or expose us to fines, penalties or litigation, which could have a material adverse effect on our business, financial condition and results of operations.

We are required to safeguard the confidential personal information of our customers and applicants. We are subject to an increasing number of federal, state, local and international laws and regulations regarding privacy and data security, as well as contractual commitments. These laws and regulations are rapidly evolving, complex, vary significantly from jurisdiction to jurisdiction, and sometimes conflict. In the absence of updated, uniform federal privacy legislation, there is a growing trend in the states in which we operate, to adopt comprehensive privacy legislation that provides consumers with various privacy rights and imposes significant compliance burdens on covered companies. Failure to comply with data security or privacy laws or regulations could subject us to regulatory enforcement actions and fines, penalties, litigation, private rights of action or public statements against us by consumer advocacy groups or others if confidential customer information is misappropriated from our computer systems, those of our vendors or others with whom we do business, or otherwise. Despite the security measures that may be in place, any such systems may be vulnerable to the types of attacks and security incidents described above. Any well-publicized compromise of security could deter people from entering into transactions that involve transmitting confidential information, impart reputational or other harm, and/or have a material adverse effect on our business. Additionally, privacy legislation may make our business partners more reluctant to share information with us that is useful in conducting our business.

Risks Related to Competition and Competitors in the Property and Casualty Insurance Market

Intense competition could negatively affect our ability to maintain or increase our profitability, particularly in light of the various competitive, financial, strategic, technological, structural, informational and resource advantages that our competitors have.

We compete, and will continue to compete, with a large number of companies, including international, national and regional insurers, specialty insurance companies, underwriting agencies and financial services institutions. We also compete with mutual insurance companies, reciprocal and exchange companies that may not have shareholders and may have different profitability targets than publicly or privately owned companies. In recent years, there has been substantial consolidation and convergence among companies in the financial services industry, resulting in increased competition from large, well-capitalized financial services firms. Many of our competitors have greater financial, technical, technological, and operating resources than we do, greater access to data analytics or "big data," and may be able to offer a wider range of, or more sophisticated, core commercial, specialty and personal line products. Some of our competitors also have different marketing, advertising and sales strategies than we do and market and sell their products to consumers directly. In addition, competition in the U.S. property and casualty insurance market has intensified over the past several years. This competition has had, and may continue to have, an adverse impact on our revenues and profitability.

The industry and we are challenged by changing practices caused by the Internet, application-based programs relying on algorithms and computer modeling to underwrite policies and administer claims, and the increased usage of real time comparative rating tools and claims management processes, which have led to greater competition in the insurance business in general, particularly on the basis of price and pressure to reduce coverages to compete on price and to respond to customer requests as quickly as possible.

We also face heightened competition resulting from the entry of new competitors and the introduction of new products by new and existing competitors. Recent entries into the property and casualty marketplace by large technology companies, retail companies, so-called "Insurtech" companies and other non-traditional insurance providers, who aim to leverage their information about technology and direct access to customers, without the burden of legacy systems, access and ability to manipulate "big data," artificial intelligence, speed in responding to customer requests or other developing opportunities, may increase competition. Increased competition could make it difficult for us to obtain new or retain existing customers. It could also 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. In addition, our administrative, technology and management information systems' expenditures could increase substantially as we try to maintain or improve our competitive position or keep up with evolving technology in order to deliver the same or similar customer or agency experience as those offered by our competitors.

We compete for business not just on the basis of price, but also on the basis of product coverages, reputation, financial strength, quality of service (including claims adjustment service), experience and breadth of product offering. We cannot provide assurance that we will be able to maintain a competitive position in the markets where we operate, or that we will be able to expand our operations into new markets.

Risks Related to Financial Strength and Debt Ratings

We are rated by several rating agencies, and downgrades to our ratings could adversely affect our operations.

Our ratings are important in establishing our competitive position and marketing the products of our insurance companies to our agents and customers. Rating information is broadly disseminated and generally used throughout the industry. Many policyholders, particularly larger commercial customers, will not purchase, and many agents will not distribute, products of insurers that do not meet certain financial strength ratings.

Our insurance company subsidiaries are rated by A.M. Best, Moody's, and S&P Global. These ratings reflect the rating agency's opinion of our insurance subsidiaries' financial strength, operating performance, position in the marketplace, risk management, and ability to meet their obligations to policyholders. These ratings are not evaluations directed to investors, and are not recommendations to buy, sell or hold our securities. Our ratings are subject to periodic review by the rating agencies, and we cannot guarantee the continued retention or improvement of our current ratings. This is particularly true given that rating agencies may change their criteria or increase capital requirements for various rating levels.

A downgrade in one or more of our or any of our subsidiaries' claims-paying ratings could negatively impact our business and competitive position, particularly in lines where customers require us to maintain minimum ratings. Additionally, a downgrade in one or more of our debt ratings could adversely impact our ability to access the capital markets and other sources of funds, increase the cost of current credit facilities, and/or adversely affect pricing of new debt that we may seek in the capital markets in the future. Our ability to raise capital in the equity markets could also be adversely affected.

Negative changes in our level of statutory surplus could adversely affect our ratings and profitability.

The capacity for an insurance company's growth in premiums is in part a function of its statutory surplus. Maintaining appropriate levels of statutory surplus, as measured by state insurance regulators, is considered important by state insurance regulatory authorities and by rating agencies. As our business grows, or due to other factors, regulators may require that additional capital be retained or contributed to increase the level of statutory surplus. Failure to maintain certain levels of statutory surplus could result in increased regulatory scrutiny, action by state regulatory authorities or a downgrade by private rating agencies. Surplus in our insurance company subsidiaries is affected by, among other things, results of operations and investment gains, losses, impairments, and dividends from each of those companies to its parent company. A number of these factors affecting our level of statutory surplus are, in turn, influenced by factors that are out of our control, including the frequency and severity of catastrophes, changes in policyholder behavior, changes in rating agency models and economic factors, such as changes in equity markets, credit markets or interest rates.

The NAIC uses a system for assessing the adequacy of statutory capital for property and casualty insurers. The system, known as risk-based capital, is in addition to the states' fixed dollar minimum capital and other requirements. The system is based on risk-based formulas that apply prescribed factors to the various risk elements in an insurer's business and investments to report a minimum capital requirement proportional to the amount of risk assumed by the insurer. Any failure to maintain appropriate levels of statutory surplus would have an adverse impact on our ability to maintain or grow our business.

Risks Related to Discontinued Operations

We could be subject to additional losses related to the sales of our discontinued FAFLIC and variable life insurance and annuity businesses and our former Chaucer business.

On January 2, 2009, we sold our remaining life insurance subsidiary, FAFLIC, to Commonwealth Annuity and Life Insurance Company ("Commonwealth Annuity"). Coincident with the sale transaction, Hanover Insurance and FAFLIC entered into a reinsurance contract whereby Hanover Insurance assumed FAFLIC's discontinued accident and health insurance business. We previously owned Commonwealth Annuity, but sold it in 2005 in conjunction with our disposal of our variable life insurance and annuity business. In connection with these transactions, we have agreed to indemnify Commonwealth Annuity for certain contingent liabilities, including litigation and other regulatory matters.

On December 28, 2018, we sold the majority of our Chaucer business (specifically our U.K.-based Lloyd's entities) to China Re, with the rest of the Chaucer sale completed in April 2019. In connection with these transactions, we made certain representations and warranties and agreed to indemnify China Re for certain pre-sale contingent liabilities, including tax and litigation matters.

We cannot provide assurance as to what the costs of any indemnifications will be when they ultimately settle.

We may incur financial losses related to our discontinued assumed accident and health reinsurance pools and arrangements.

We previously participated, through FAFLIC, in approximately 40 assumed accident and health reinsurance pools and arrangements. The business was retained in the sale of FAFLIC and assumed by Hanover Insurance through a reinsurance agreement. In 1999, prior to the sale of FAFLIC to Commonwealth Annuity, FAFLIC had ceased writing new premiums in this business, subject to certain contractual obligations. We are currently monitoring and managing the run-off of our related participation in the 22 pools with remaining liabilities. See "Item 1 – Business – Discontinued Operations," for information on the processes and risks associated with reserves established for these businesses.

Our long-term care pool accounts for the majority of our remaining accident and health reinsurance pool business. The potential risk and exposure of our long-term care pool is based upon expected estimated claims and payment patterns, using assumptions for, among other things, morbidity, lapses, future premium rates, the impact of policy inflation protection riders, and the interest rate used for discounting the future projected cash flows. The long-term exposure of this pool depends upon how our actual experience compares with these future cash flow projection assumptions. If any of our assumptions prove to be inaccurate, our reserves may be inadequate, which may have a material adverse effect on our results of operations.

Based on the information provided by the pool managers, we believe that the recorded reserves related to this business are appropriate. However, due to the inherent volatility in this business and the reporting lag of losses that tend to develop over time and which ultimately affect excess covers, as well as uncertainty surrounding both future claim expenses and with future premium rate levels for certain of these businesses, there can be no assurance that current reserves are adequate or that we will not have additional losses in the future.

Risks Related to Investments, Capital Markets and Economic Conditions

Other market fluctuations and general economic, market and political conditions may also negatively affect our business, profitability, investment portfolio, and the market value of our common stock.

It is difficult to predict the impact of a challenging economic environment on our business. In our Core Commercial and Specialty lines, a difficult economy in the past has resulted in reductions in demand for insurance products and services since there are more companies ceasing to do business and there are fewer business start-ups, particularly as businesses are affected by a decline in overall consumer and business spending, and also in lines of business where premium levels may be dependent upon payroll volumes and/or employment levels. Additionally, claims frequency could increase as policyholders submit and pursue claims more aggressively than in the past, fraud incidences may increase, or we may experience higher incidents of abandoned properties or poorer maintenance, which may also result in more claims activity. We have experienced higher workers' compensation claims as injured employees take longer to return to work, increased surety losses as construction companies experience financial pressures and higher retroactive premium returns as audit results reflect lower payrolls. Our business could also be affected by an ensuing consolidation of independent insurance agencies. Our ability to increase pricing has been impacted as agents and policyholders have been more price sensitive, customers shop for policies more frequently or aggressively, utilize comparative rating models or, in Personal Lines in particular, turn to direct sales channels rather than independent agents. We have experienced decreased new business premium levels, retention and renewal rates, and renewal premiums. Specifically, in Personal Lines, policyholders may reduce coverages or change deductibles to reduce premiums, experience declining home values, or be subject to increased foreclosures, and policyholders may retain older or less expensive automobiles and purchase or insure fewer ancillary items such as boats, trailers and motor homes for which we provide coverages. Additionally, if as a result of a difficult economic environment, drivers continue to eliminate automobile insurance coverage or to reduce their bodily injury limit, we may be exposed to more uninsured and underinsured motorist coverage losses. Conversely, favorable economic conditions may also impact our business and results of operations.

At December 31, 2022, we held approximately $8.8 billion of investment assets in categories such as fixed maturities, equity securities, other investments, and cash and short-term investments. Our investments are primarily concentrated in the domestic market. Our investment returns, and thus our profitability, statutory surplus and shareholders' equity, may be adversely affected from time to time by conditions affecting our specific investments and, more generally, by bond, stock, real estate and other market fluctuations and general economic, market and political conditions, including the impact of the Pandemic, changing government policies, including monetary policies, and geopolitical risks (which may include the impact of terrorism in various parts of the world or pandemic events). These broader market conditions are out of our control. Our ability to make a profit on insurance products depends in significant part on the returns on investments supporting our obligations under these products, and the value of specific investments may fluctuate substantially depending on the foregoing conditions. We may use a variety of strategies to hedge our exposure to interest and currency rates and other market risks. However, hedging strategies are not always available and carry certain credit risks, and our hedging could be ineffective. Moreover, increased government regulation of certain derivative transactions used to hedge certain market risks has served to prevent (or otherwise substantially increase the cost associated with) hedging such risks.

Additionally, the aggregate performance of our investment portfolio depends, to a significant extent, on the ability of our investment managers to select and manage appropriate investments. As a result, we are also exposed to operational and compliance risks, which may include, but are not limited to, a failure to follow our investment guidelines, technological and staffing deficiencies and inadequate disaster recovery plans. The failure of these investment managers to perform their services in a manner consistent with our expectations and investment objectives could adversely affect our ability to conduct our business.

Debt securities comprise a material portion of our investment portfolio. Although we have an investment strategy that provides for asset diversification, the concentration of our investment portfolio in any one type of investment, industry or geography could have a disproportionately adverse effect on our investment portfolio. The issuers of debt securities, as well as borrowers under the loans we make, customers, trading counterparties, counterparties under swaps and other derivative contracts, banks which have commitments under our various borrowing arrangements, and reinsurers, may be affected by declining market conditions or credit weaknesses. These parties may default on their obligations to us due to lack of liquidity, downturns in the economy or real estate values, operational failure, bankruptcy or other reasons. Future increases in interest rates could result in increased defaults as borrowers are unable to pay the additional borrowing costs on variable rate securities or obtain refinancing. We cannot provide assurance that impairment charges will not be necessary in the future. In addition, evaluation of available-for-sale securities for credit-related impairment losses includes inherent uncertainty and subjective determinations. We cannot be certain that such impairments are adequate as of any stated date. Our ability to fulfill our debt and other obligations could be adversely affected by the default of third parties on their obligations owed to us.

Deterioration in the global financial markets may adversely affect our investment portfolio and have a related impact on our other comprehensive income, shareholders' equity and overall investment performance. Recent economic activity has slowed, although growth continues at a moderate rate, and monetary policies in developed economies currently remain accommodative. However, the effects of geo-political developments and conditions in global financial markets could change rapidly in ways that we cannot anticipate, resulting in additional realized and unrealized losses.

Market conditions also affect the value of assets under our employee pension plans, including our qualified defined benefit plan. The expense or benefit related to this plan results from several factors, including, but not limited to, changes in the market value of plan assets, interest rates, regulatory requirements or judicial interpretation of benefits. At December 31, 2022, our plan assets included approximately 90% of fixed maturities and 10% of equity securities and other assets. Additionally, our qualified plan assets exceeded liabilities by approximately $9.8 million at December 31, 2022. Declines in the market value of plan assets and lower interest rates from levels at December 31, 2022, among other factors, could impact our funding estimates and negatively affect our results of operations. Deterioration in market conditions and differences between our assumptions and actual occurrences and behaviors, could result in a need to fund more into the qualified plan to maintain an appropriate funding level.

Additional uncertainties, which could affect our business prospects and investments include the current U.S. political environment, which is characterized by potentially sharp policy differences that may affect all aspects of the economy.

We may experience unrealized losses on our investments, especially during a period of heightened volatility, or if assumptions related to our investment valuations are changed, which could have a material adverse effect on our results of operations or financial condition.

Our investment portfolio and shareholders' equity can be, and in the past have been, significantly impacted by changes in the market values of our securities. U.S. and global financial markets and economies remain uncertain, particularly in light of lingering economic effects of the Pandemic, inflationary pressures and potential recessionary impacts on the economy. Market uncertainty could result in unrealized and realized losses in future periods, and adversely affect the liquidity of our investments, which could have a material adverse impact on our results of operations and our financial position. Information with respect to interest rate sensitivity is included in "Quantitative and Qualitative Disclosures" in Management's Discussion and Analysis. Valuation of financial instruments (i.e., Level 1, 2, or 3) include methodologies, estimates, assumptions and judgments that are inherently subjective and open to different interpretations and could result in changes to investment valuations or the ability to receive such valuations on sale. During periods of market disruption, it may be difficult to value certain of our securities if trading becomes less frequent and/or market data becomes less observable. In addition, in times of financial market disruption, certain asset classes that were in active markets with significant observable data may become illiquid. In those cases, the valuation process includes inputs that are less observable and require more subjectivity and judgment by management. Changes in these subjective methodologies, estimates, assumptions and judgments used to value our investments could also materially affect the valuation of certain investments.

If, following such declines, we are unable to hold our investment assets until they recover in value, or if such asset value never recovers, we would incur impairment losses that would be recognized as realized losses in our results of operations, reduce net income and earnings per share and adversely affect our liquidity and capital position. Impairment determinations, like valuations, are also subjective, and changes to the methodologies, estimates, assumptions and judgments used to determine impairments may affect the timing and amount of impairment losses recognized in our results of operations. Temporary declines in the market value of fixed maturities are recorded as unrealized losses, which do not affect net income and earnings per share, but reduce other comprehensive income, which is reflected on our Consolidated Balance Sheets. We cannot provide assurance that we will not have additional impairment losses and/or unrealized or realized investment losses in the future.

We invest a portion of our portfolio in common stocks, preferred stocks, and limited partnerships. The value of these assets fluctuates with the equity markets. Particularly in times of economic weakness, the market value and liquidity of these assets may decline, and may impact net income, capital and cash flows.

We are exposed to significant capital market risks related to changes in interest rates, credit spreads, and equity prices, which may adversely affect our results of operations, financial position or cash flows.

We are exposed to significant capital market risks related to changes in interest rates, credit spreads, and equity prices. Significant declines in equity prices, changes in interest rates, and changes in credit spreads each could have a material adverse effect on our results, financial position or cash flows. Our exposure to interest rate risk relates primarily to the market price and cash flow variability associated with changes in interest rates. Our investment portfolio contains interest rate sensitive instruments, such as fixed income securities, which may be adversely affected by changes in interest rates from governmental monetary policies, domestic and international economic and political conditions and other factors beyond our control. A rise in market yields would reduce the fair value of our investment portfolio, but it provides the opportunity to earn higher rates of return on funds reinvested. A decline in interest rates, on the other hand, would increase the fair value of our investment portfolio, but we would earn lower rates of return on reinvested assets. We may be forced to liquidate investments prior to maturity at a loss in order to cover liabilities, and such liquidation could be accelerated in the event of significant loss events, such as catastrophes. Although we take measures to manage the economic risks of investing in a changing interest rate environment, we may not be able to mitigate the interest rate risk of our assets relative to our liabilities.

Our investment portfolio is invested primarily in high quality, investment-grade fixed income securities. However, we also invest in non-investment-grade high yield fixed income securities and limited partnerships. These securities, which pay a higher rate of interest, also have a higher degree of credit or default risk. These securities may also be less liquid in times of economic weakness or market disruptions. Additionally, reported values of our investments do not necessarily reflect the lowest current market price for the asset, and if we require significant amounts of cash on short notice, we may have difficulty selling our investments in a timely manner, be forced to sell them for less than we otherwise would have been able to realize, or both. While we have procedures to monitor the credit risk and liquidity of our invested assets, we expect from time to time, and particularly in periods of economic weakness, to experience default losses in our portfolio. This would result in a corresponding reduction of net income, capital and cash flows.

Inflationary pressures may negatively impact expenses, reserves and the value of investments.

Inflationary pressures in the U.S., as a result of the Pandemic, or otherwise, with respect to medical and health care, automobile repair and construction costs, as well as social inflation of litigation costs, jury awards and settlement expectations, all of which are significant components of our indemnity liabilities under policies we issue to our customers, and which could also impact the adequacy of reserves we have set aside for prior accident years, may have a negative effect on our results of operations. Inflationary pressures also cause or contribute to, or are the result of, increases in interest rates, which would reduce the fair value of our investment portfolio.

Risks Related to Capital, Liquidity and Cash Flow

We are a holding company and rely on our insurance company subsidiaries for cash flow; we may not be able to receive dividends from our subsidiaries in needed amounts and may be required to provide capital to support their operations.

We are a holding company for a group of insurance companies, and our principal assets are the shares of capital stock of these subsidiaries. Our ability to make required interest payments on our debt, as well as our ability to pay operating expenses and pay dividends to shareholders, depends upon the receipt of sufficient funds from our subsidiaries. The payment of dividends by our insurance company subsidiaries is subject to regulatory restrictions and will depend on the surplus and future earnings of these subsidiaries, as well as these regulatory restrictions. We are required to notify insurance regulators prior to paying any dividends from our insurance subsidiaries, and pre-approval is required with respect to “extraordinary dividends.”

Because of the regulatory limitations on the payment of dividends from our insurance company subsidiaries, we may not always be able to receive dividends from these subsidiaries at times and in amounts necessary to meet our debt and other obligations, or to pay dividends to our shareholders. The inability of our subsidiaries to pay dividends to us in an amount sufficient to meet our debt interest and funding obligations would have a material adverse effect on us. These regulatory dividend restrictions also impede our ability to transfer cash and other capital resources among our subsidiaries. Similarly, our insurance subsidiaries may require capital from the holding company to support their operations.

Our dependence on our insurance subsidiaries for cash flow, and their potential need for capital support, exposes us to the risk of changes in their ability to generate sufficient cash inflows from new or existing customers, from inadequate investment returns, or from increased cash outflows. Cash outflows may result from claims activity and expense payments. Because of the nature of our business, claims activity can arise suddenly and in amounts which could outstrip our capital or liquidity resources (particularly in the event of a large catastrophe loss). Reductions in cash flow or capital demands from our subsidiaries could have a material adverse effect on our business and results of operations.

We may require additional capital or credit in the future, which may not be available or only available on unfavorable terms.

We monitor our capital adequacy on a regular basis. Our future capital and liquidity requirements depend on many factors, including premiums written, loss reserves and claim payments, investment portfolio composition and risk exposures, the availability of letters and lines of credit, and maturing outstanding debt, as well as regulatory and rating agency capital requirements. In addition, our capital strength can affect our ratings.

To the extent that our existing capital is insufficient or unavailable to fund our future operating requirements and/or cover claim losses, we may need to raise additional funds through financings or limit our growth. Any equity or debt financing, if available, may be on terms that are unfavorable to us. In the case of equity financings, dilution to our shareholders could result and, in any case, such securities may have rights, preferences, and privileges that are senior to our common stock. If we are not able to obtain additional capital as necessary, our business, results of operations and financial condition could be adversely affected.

Residual Risks Related to the Pandemic

The residual impact of the COVID-19 Pandemic and related general economic conditions could have a material adverse effect on our results of operations, financial condition or cash flows.

Circumstances relating to the Pandemic have been unprecedented in scope and impact, continue to evolve, and are complex and uncertain. We are still monitoring and assessing the potential future impacts of the Pandemic on our business, financial condition and results of operations. Prolonged supply chain disruptions, inflation, potential recessionary impacts or other difficulties caused by the Pandemic could perpetuate more costly or lengthy claims resolutions. These changes may materially and adversely affect our ability to profitably grow our business or maintain premium levels over loss costs, particularly if these conditions exist for a significant amount of time. Also, it may be more difficult or costly to obtain reinsurance for certain types of coverages or at retention levels appropriate for our business mix.

As a result of the Pandemic and related and subsequent economic conditions, our investment portfolio has become volatile. The severity and length of the inflationary environment may continue to have a negative impact on our investment portfolio, liquidity and capital position, of which the impact could be material.

While we believe that our in-force Core Commercial and Specialty policies in large part do not cover business interruption losses related to the Pandemic, legislation has been discussed and introduced in various states and in the U.S. Congress to retroactively amend insurance contracts to provide business interruption coverage, to impose presumptions on insurance policy interpretation, and/or limit policy exclusions for losses allegedly related to the Pandemic. While we believe that many of those proposals, including retroactive legislation changing the terms of an insurance contract, would be unconstitutional and otherwise violative of well-established law, if such changes were to be enacted and upheld, we would be exposed to a significant unfunded liability. On the Federal level, there is also uncertainty around legislation to address insurance coverages for pandemics prospectively. State regulators may also continue to impose premium refund orders similar to those issued to date that call for premium refunds or credits across multiple lines of business, including our Core Commercial, Specialty and Personal Lines, mandate rate reductions for lines such as personal automobile and commercial automobile coverages due to a decrease in claims frequency, and/or mandate additional presumptions of compensability in workers' compensation coverages. The uncertainties related to these various legislative and regulatory matters, and the potential that other such uncertainties will arise in the post-Pandemic period, could adversely impact our ability to sustain adequate returns in certain lines of business or in some cases operate lines profitably.

General Risk Factors

If we are unable to attract, develop and retain qualified personnel, or if we experience the loss or retirement of key executives or other key employees, particularly those experienced in the property and casualty industry, we may not be able to compete effectively, and our operations could be impacted significantly.

Errors or omissions, misconduct or fraud in connection with the administration of any of our insurance or investment management operations may cause our business and profitability to be negatively impacted.

Changes in current accounting practices and future pronouncements may require us to incur considerable additional compliance expenses, to retroactively apply new requirements, or to make financial restatements.

Failure to design, implement or maintain effective internal control over financial reporting could have a material adverse effect on financial statements, financial reporting, investor confidence, our business and stock price.

Our stock price is influenced by our financial performance, industry trends and sentiment and other larger macro-economic factors described above in risk factors related to investments, capital markets and economic conditions that are out of our control. These factors could cause the market price of our common stock to fluctuate, become volatile, and there is no guarantee that it will remain at or exceed current or historical levels.

ITEM 1B–UNRESOLVED STAFF COMMENTS

None.

ITEM 2–PROPERTIES

We conduct our business operations primarily in our company-owned facilities in Worcester, Massachusetts and Howell, Michigan. We also lease offices throughout the United States for branch sales, underwriting and claims processing functions, and the operations of acquired subsidiaries.

We believe our facilities are adequate for our present needs in all material respects.

ITEM 3–LEGAL PROCEEDINGS

The Company has been named a defendant in various legal proceedings arising in the normal course of business. In addition, the Company is involved, from time to time, in examinations, investigations and proceedings by governmental and self-regulatory agencies. The potential outcome of any such action or regulatory proceedings in which the Company has been named a defendant or the subject of an inquiry, examination or investigation, and its ultimate liability, if any, from such action or regulatory proceedings, is difficult to predict at this time. The ultimate resolutions of such proceedings are not expected to have a material effect on the Company's financial position, although they could have a material effect on the results of operations for a particular quarterly or annual period.

ITEM 4–MINE SAFETY DISCLOSURES

Not applicable.

PART II

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

COMMON STOCK AND STOCKHOLDER OWNERSHIP

Our common stock is traded on the New York Stock Exchange under the symbol "THG." On February 21, 2023, we had approximately 14,183 shareholders of record and 35,604,942 shares of common stock outstanding. On the same date, the trading price of our common stock was $141.88 per share.

DIVIDENDS

We currently expect that quarterly cash dividends, comparable to the $0.81 per share dividend we paid in the fourth quarter of 2022, will continue to be paid in the future; however, the payment of future quarterly or special dividends on our common stock will be determined by the Board of Directors from time to time based upon cash available at our holding company, our results of operations and financial condition and such other factors as the Board of Directors considers relevant.

Dividends to shareholders may be funded from dividends paid to us from our subsidiaries. Dividends from insurance subsidiaries are subject to restrictions imposed by state insurance laws and regulations. See "Liquidity and Capital Resources" in Management's Discussion and Analysis and Note 11 – "Dividend Restrictions" in the Notes to Consolidated Financial Statements.

ISSUER PURCHASES OF EQUITY SECURITIES

The Board of Directors authorized a stock repurchase program which provides for aggregate repurchases of our common stock of up to $1.3 billion. Under the repurchase authorization, we may repurchase, from time to time, common stock in amounts, at prices and at such times as we deem appropriate, subject to market conditions and other considerations. Repurchases may be executed using open market purchases, privately negotiated transactions, accelerated repurchase programs or other transactions. We are not required to purchase any specific number of shares or to make purchases by any certain date under this program. During 2022, we repurchased approximately 0.2 million shares, at an aggregate cost of $30.8 million. As of December 31, 2022, we had repurchased 7.9 million shares under this $1.3 billion program and had approximately $330 million available for additional repurchases.

Shares purchased in the fourth quarter of 2022 were as follows:

PERIOD	Total Number of Shares Purchased	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	Approximate Dollar Value of Shares That May Yet be Purchased Under the Plans or Programs *(in millions)*
October 1 - 31, 2022 (1)	489	$ 141.24	—	$ 330
November 1 - 30, 2022 (1)	119	144.85	—	330
December 1 - 31, 2022 (1)	680	135.55	—	330
Total	1,288	$ 138.57	—	$ 330

(1) Shares purchased were used to satisfy tax withholding amounts due from employees related to the receipt of stock which resulted from the exercise or vesting of equity awards for the months ended October 31, November 30 and December 31, 2022, respectively.

ITEM 6–[RESERVED]

ITEM 7–MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

TABLE OF CONTENTS

Introduction	36
Executive Overview	36
Description of Operating Segments	37
Results of Operations - Consolidated	38
Results of Operations - Segments	39
Investments	53
Quantitative and Qualitative Disclosures about Market Risk	56
Other Items	57
Income Taxes	58
Critical Accounting Estimates	58
Statutory Surplus of Insurance Subsidiaries	60
Liquidity and Capital Resources	61
Contingencies and Regulatory Matters	63
Risks and Forward-Looking Statements	63
Glossary of Selected Insurance Terms	63

INTRODUCTION

The following Management's Discussion and Analysis of Financial Condition and Results of Operations is intended to assist readers in understanding the consolidated results of operations and financial condition of The Hanover Insurance Group, Inc. and its subsidiaries ("THG"). Consolidated results of operations and financial condition are prepared in accordance with generally accepted accounting principles in the United States of America ("U.S. GAAP"). This discussion should be read in conjunction with the Consolidated Financial Statements and related footnotes included elsewhere herein.

Results of operations include the accounts of The Hanover Insurance Company ("Hanover Insurance") and Citizens Insurance Company of America ("Citizens"), our principal property and casualty companies, and certain other insurance and non-insurance subsidiaries. Our results of operations also include the results of our discontinued operations, consisting primarily of our former accident and health insurance business.

EXECUTIVE OVERVIEW

Business operations consist of four operating segments: Core Commercial, Specialty, Personal Lines and Other.

Our strategy, which focuses on the independent agency distribution channel, supports THG's commitment to our select independent agents. It is designed to generate profitable growth by leveraging the strengths of our distribution approach, including expansion of our agency footprint in underpenetrated geographies, as warranted. As part of that strategy, we have increased our capabilities in specialty markets and made investments designed to develop growth solutions for our agency distribution channel and meet the needs of our customers. Our goal is to grow responsibly in all of our businesses, while managing volatility.

Net income was $116.0 million in 2022, compared to $418.7 million in 2021, a decrease of $302.7 million, primarily due to changes in the fair value of equity securities and lower operating income.

Operating income before interest expense and income taxes (a non-GAAP financial measure; see also "Results of Operations – Consolidated – Non-GAAP Financial Measures") was $285.1 million in 2022 compared to $432.3 million in 2021, a decrease of $147.2 million. This decrease was primarily due to higher current accident year losses and lower net favorable development on prior years' loss reserves, partially offset by earned premium growth. The higher current accident year losses were primarily due to higher severity, as a result of inflation and supply chain disruptions, and increased accident frequency in our personal automobile line. In addition, losses in our homeowners line have increased due to higher severity.

Pre-tax catastrophe losses were $402.6 million in 2022 and 2021. Included in 2022 were $165.0 million of pre-tax catastrophe losses related to Winter Storm Elliott, which occurred in the fourth quarter. Net favorable development on prior years' loss reserves was $20.6 million in 2022, compared to $56.1 million in 2021, a decrease of $35.5 million.

Due to persistent supply chain disruptions emerging from the COVID-19 pandemic ("Pandemic"), and significant inflation in the U.S economy, among other factors outside our control, we are experiencing substantially higher claims costs, particularly in our automobile and homeowners lines of business. Additionally, several other Pandemic uncertainties persist, including evolving driving patterns and court caseload backlogs. Although we are taking actions to address our higher claims costs, such elevated costs may affect the property and casualty insurance industry, our business, and our financial results over future periods. (See "Contingencies and Regulatory Matters" and "Item 1A – Risk Factors" for further discussion).

Core Commercial

Core Commercial is divided into two distinct businesses, small commercial and middle market, both of which focus on account business, including commercial multiple peril, commercial automobile, workers' compensation and other (monoline general liability, ancillary professional, commercial umbrella, and monoline property). Small commercial focuses on small businesses, with annual policy premiums generally up to $50,000. Small commercial recently launched TAP sales, a quoting platform that has enhanced the ease of doing business, and generated approximately an 18% increase in new business submissions in 2022 compared to 2021. Middle market provides coverage to mid-sized businesses with annual policy premiums generally between $50,000 and $500,000. Middle market offers coverage in distinct industry segments, including technology, manufacturing, human services, retail, real estate, and others. We believe that our account-focused approach to the small commercial market and distinctiveness in the middle market, including our diversified portfolio of products, delivers significant value to agents and policyholders. We continue to pursue our core strategy of developing strong relationships with retail agents, enhanced franchise value through selective distribution, distinctive products and coverages, and through continued investment in industry segmentation. Net premiums written increased 7.2% in 2022, compared to the same period in 2021, primarily driven by pricing and exposure increases.

Underwriting results decreased in 2022, primarily due to higher catastrophe losses. The competitive nature of the Core Commercial market requires us to be highly disciplined in our underwriting process to ensure that we write business at acceptable margins, and we continue to seek rate increases across many lines of business.

Specialty

Specialty offers a comprehensive suite of products focused predominately on small to mid-sized businesses. This includes numerous specialized product areas that are organized into four distinct divisions – Professional and Executive Lines, Specialty Property and Casualty ("Specialty P&C"), Marine, and Surety and Other. We believe that this distribution of Specialty products, primarily through retail agents supplemented by select specialists helps to enhance our overall agent value and increase growth opportunities by providing agents easier access to placement solutions for Specialty needs, including those that complement Core Commercial accounts. Net premiums written increased 11.2% in 2022, compared to the same period in 2021, primarily due to pricing, new business and exposure increases.

Underwriting results increased in 2022, primarily due to lower catastrophe losses, earned premium growth, and lower current accident year losses. The competitive nature of the Specialty market requires us to be highly disciplined in our underwriting process to ensure that we write business at acceptable margins, and we continue to seek rate increases across many lines of business.

Personal Lines

Personal Lines focuses on working with high quality, value-oriented agencies that deliver consultative selling to customers and stress the importance of account rounding, which is the conversion of single policy customers to accounts with multiple policies and/or additional coverages, to address customers' broader objectives. Approximately 88% of our policies in force have been issued to customers with multiple policies and/or coverages with us. We are focused on seeking profitable growth opportunities, building a distinctive position in the market in order to meet our customers' needs and diversifying geographically. We continue to seek appropriate rate increases that meet or exceed underlying loss cost trends, subject to regulatory and competitive considerations.

Net premiums written increased 11.1% in 2022, compared to the same period in 2021, primarily due to renewal price increases across the year and, to a lesser extent, higher new business. Underwriting results decreased in 2022, primarily due to higher current accident year losses in our personal automobile and homeowners lines.

DESCRIPTION OF OPERATING SEGMENTS

Primary business operations include insurance products and services currently provided through four operating segments: Core Commercial, Specialty, Personal Lines and Other. Core Commercial includes commercial multiple peril, commercial automobile, workers' compensation, and other commercial lines coverages provided to small and mid-sized businesses. Specialty includes four divisions of business: Professional and Executive Lines, Specialty P&C, Marine, and Surety and Other. Specialty P&C includes coverages such as program business (providing commercial insurance to markets with specialized coverage or risk management needs related to groups of similar businesses), specialty industrial and commercial property, excess and surplus lines and specialty general liability coverage. Personal Lines includes personal automobile, homeowners and other personal coverages, such as umbrella. Included in the "Other" segment are Opus Investment Management, Inc., which markets investment management services to institutions, pension funds, and other organizations; earnings on holding company assets; holding company and other expenses, including certain costs associated with retirement benefits due to our former life insurance employees and agents; and our run-off voluntary assumed property and casualty pools and run-off direct asbestos and environmental businesses. During the first quarter of 2022, we disaggregated our former Commercial Lines segment into Core Commercial and Specialty segments. Prior periods reflect this new presentation. This presentation is consistent with the manner in which our chief operating decision maker evaluates results in deciding how to allocate resources and in assessing performance.

We report interest expense on debt separately from the earnings of our operating segments. This consists primarily of interest on our senior and subordinated debentures.

RESULTS OF OPERATIONS – CONSOLIDATED

2022 Compared to 2021

Consolidated net income was $116.0 million in 2022, compared to $418.7 million in 2021, a decrease of $302.7 million. The year over year comparison of consolidated net income reflects a decrease in after-tax net realized and unrealized investment losses of $184.4 million, primarily related to changes in the fair value of equity securities as well as lower operating income. Operating income before interest expense and income taxes was $285.1 million in 2022 compared to $432.3 million in 2021, a decrease of $147.2 million. This decrease was primarily due to higher current accident year losses and lower net favorable development on prior years' loss reserves, partially offset by earned premium growth. Pre-tax catastrophe losses were $402.6 million in 2022 and 2021. Included in 2022 were $165.0 million of pre-tax catastrophe losses related to Winter Storm Elliott, which occurred in the fourth quarter.

2021 Compared to 2020

Consolidated net income was $418.7 million in 2021, compared to $358.7 million in 2020, an increase of $60.0 million. The year over year comparison of consolidated net income reflects an increase in after-tax net realized and unrealized investment gains of $88.5 million, principally related to changes in the fair value of equity securities. This was partially offset by a decrease in operating income before interest expense and income taxes of $52.4 million. The decrease in operating income before interest expense and income taxes was primarily due to higher catastrophe losses and increased Personal Lines non-catastrophe current accident year losses, partially offset by higher net investment income, earned premium growth, and net favorable development on prior years' loss reserves.

The following table reflects operating income (loss) before interest expense and income taxes for each operating segment and a reconciliation to consolidated net income from operating income before interest expense and income taxes (a non-GAAP measure).

YEARS ENDED DECEMBER 31 *(in millions)*	2022	2021	2020
Operating income (loss) before interest expense and income taxes:			
Core Commercial	**$ 106.9**	$ 138.0	$ 178.1
Specialty	**186.0**	131.9	97.3
Personal Lines	**(8.8)**	158.5	212.5
Other	**1.0**	3.9	(3.2)
Operating income before interest expense and income taxes	**285.1**	432.3	484.7
Interest expense on debt	**(34.1)**	(34.0)	(37.1)
Operating income before income taxes	**251.0**	398.3	447.6
Income tax expense on operating income	**(51.1)**	(80.0)	(92.6)
Operating income	**199.9**	318.3	355.0
Non-operating items:			
Net realized and unrealized investment gains (losses)	**(106.5)**	123.0	5.0
Net loss from repayment of debt	**—**	—	(6.2)
Other	**(0.5)**	—	(1.6)
Income tax benefit (expense) on non-operating items	**23.9**	(21.3)	9.8
Income from continuing operations, net of taxes	**116.8**	420.0	362.0
Discontinued operations (net of taxes):			
Income from Chaucer business	**—**	1.2	0.4
Loss from discontinued life businesses	**(0.8)**	(2.5)	(3.7)
Net income	**$ 116.0**	$ 418.7	$ 358.7

Non-GAAP Financial Measures

In addition to consolidated net income, discussed above, we assess our financial performance based upon pre-tax "operating income," and we assess the operating performance of each of our four operating segments based upon the pre-tax operating income (loss) generated by each segment. As reflected in the table above, operating income before interest expense and income taxes excludes interest expense on debt and certain other items, which we believe are not indicative of our core operations, such as net realized and unrealized investment gains and losses. Such gains and losses are excluded since they are determined by interest rates, financial markets and the timing of sales. Also, operating income before interest expense and income taxes excludes net gains and losses on disposals of businesses, gains and losses related to the repayment of debt, discontinued operations, costs to acquire businesses, restructuring costs, the cumulative effect of accounting changes and certain other items. Although the items excluded from operating income before interest expense and income taxes are important components in understanding and assessing our overall financial performance, we believe a discussion of operating income before interest expense and income taxes enhances an investor's understanding of our results of operations by highlighting net income attributable to the core operations of the business. However, operating income before interest expense and income taxes, which is a non-GAAP measure, should not be construed as a substitute for income before income taxes or income from continuing operations, and operating income should not be construed as a substitute for net income.

Catastrophe losses and prior years' reserve development are significant components in understanding and assessing the financial performance of our business. Management reviews and evaluates catastrophes and prior years' reserve development separately from the other components of earnings. References to "current accident year underwriting results" exclude prior accident year reserve development and may also be presented "excluding catastrophes." Prior years' reserve development and catastrophes are not predictable as to timing or the amount that will affect the results of our operations and have an effect on each year's operating and net income. Management believes that providing certain financial metrics and trends excluding the effects of catastrophes and prior years' reserve development helps investors to understand the variability in periodic earnings and to evaluate the underlying performance of our operations. Discussion of catastrophe losses in this Management's Discussion and Analysis includes development on prior years' catastrophe reserves and, unless otherwise indicated, such development is excluded from discussions of prior year loss and loss adjustment expenses ("LAE") reserve development.

RESULTS OF OPERATIONS — SEGMENTS

The following is our discussion and analysis of the results of operations by business segment. The operating results are presented before interest expense, income taxes and other items which management believes are not indicative of our core operations, including realized gains and losses, as well as unrealized gains and losses on equity securities, and the results of discontinued operations.

The following table summarizes the results of operations for the periods indicated:

YEARS ENDED DECEMBER 31	2022	2021	2020
(in millions)			
Operating revenues			
Net premiums written	**$ 5,476.5**	$ 4,993.4	$ 4,598.5
Net premiums earned	**$ 5,252.3**	$ 4,770.2	$ 4,527.4
Net investment income	**296.3**	310.7	265.1
Other income	**26.5**	23.9	27.3
Total operating revenues	**5,575.1**	5,104.8	4,819.8
Losses and operating expenses			
Losses and LAE	**3,623.4**	3,134.2	2,844.5
Amortization of deferred acquisition costs	**1,093.2**	982.7	951.0
Other operating expenses	**573.4**	555.6	539.6
Total losses and operating expenses	**5,290.0**	4,672.5	4,335.1
Operating income before interest expense and income taxes	**$ 285.1**	$ 432.3	$ 484.7

2022 Compared to 2021

Operating income before interest expense and income taxes was $285.1 million for the year ended December 31, 2022, compared to $432.3 million for the year ended December 31, 2021, a decrease of $147.2 million. This decrease was primarily due to higher current accident year losses and lower net favorable development on prior years' loss reserves, partially offset by earned premium growth. The higher current accident losses were primarily due to higher severity, as a result of inflation and supply chain disruptions, and increased accident frequency in our personal automobile line.

Net premiums written increased $483.1 million for the year ended December 31, 2022, compared to the year ended December 31, 2021. This was primarily due to pricing and exposure increases and continued strong retention.

2021 Compared to 2020

Operating income before interest expense and income taxes was $432.3 million for the year ended December 31, 2021, compared to $484.7 million for the year ended December 31, 2020, a decrease of $52.4 million. This decrease was primarily due to higher catastrophe losses and increased Personal Lines non-catastrophe current accident year losses, partially offset by higher net investment income, earned premium growth, and net favorable development on prior years' loss reserves. The higher Personal Lines non-catastrophe current accident year losses were primarily due to higher personal automobile losses, attributable to higher loss severity and frequency, though 2021 loss frequency was below pre-Pandemic levels.

Net premiums written increased $394.9 million for the year ended December 31, 2021, compared to the year ended December 31, 2020, primarily due to pricing increases, a reduction in insured business activity in 2020, and a 2020 premium refund. During 2020, we returned approximately $30 million of premiums to our eligible personal automobile customers in all of our markets, providing financial relief during the Pandemic.

PRODUCTION AND UNDERWRITING RESULTS

The following tables summarize premiums written on a gross and net basis, net premiums earned and loss (including catastrophe losses), LAE, expense, and combined ratios for our Core Commercial, Specialty and Personal Lines segments. Loss, LAE, catastrophe loss and combined ratios shown below include prior year reserve development. These items were not meaningful for our Other segment.

	YEAR ENDED DECEMBER 31, 2022						
(dollars in millions)	Gross Premiums Written	Net Premiums Written	Net Premiums Earned	Catastrophe Loss Ratios	Loss & LAE Ratios	Expense Ratios	Combined Ratios
Core Commercial	**$ 2,276.3**	**$ 1,999.9**	**$ 1,950.5**	**9.9**	**68.5**	**32.7**	**101.2**
Specialty	**1,500.1**	**1,243.7**	**1,189.0**	**2.8**	**54.0**	**35.3**	**89.3**
Personal Lines	**2,304.4**	**2,232.9**	**2,112.8**	**8.3**	**77.8**	**26.5**	**104.3**
Total	**$ 6,080.8**	**$ 5,476.5**	**$ 5,252.3**	**7.7**	**69.0**	**30.8**	**99.8**

	YEAR ENDED DECEMBER 31, 2021						
(dollars in millions)	Gross Premiums Written	Net Premiums Written	Net Premiums Earned	Catastrophe Loss Ratios	Loss & LAE Ratios	Expense Ratios	Combined Ratios
Core Commercial	$ 2,099.5	$ 1,864.8	$ 1,810.9	9.7	67.4	32.9	100.3
Specialty	1,349.4	1,118.9	1,029.9	5.0	57.4	35.5	92.9
Personal Lines	1,895.4	2,009.7	1,929.4	9.1	68.5	27.7	96.2
Total	$ 5,344.3	$ 4,993.4	$ 4,770.2	8.4	65.7	31.3	97.0

	YEAR ENDED DECEMBER 31, 2020						
(dollars in millions)	Gross Premiums Written	Net Premiums Written	Net Premiums Earned	Catastrophe Loss Ratios	Loss & LAE Ratios	Expense Ratios	Combined Ratios
Core Commercial	$ 1,949.4	$ 1,726.2	$ 1,703.7	5.3	63.2	33.2	96.4
Specialty	1,251.6	1,006.9	979.6	4.3	58.3	36.5	94.8
Personal Lines	1,953.5	1,865.4	1,844.1	8.4	64.7	27.7	92.4
Total	$ 5,154.5	$ 4,598.5	$ 4,527.4	6.3	62.8	31.6	94.4

The following tables summarize net premiums written, and loss and LAE and catastrophe loss ratios by line of business for the Core Commercial, Specialty and Personal Lines segments. Loss and LAE and catastrophe loss ratios include prior year reserve development.

	YEAR ENDED DECEMBER 31, 2022		
(dollars in millions)	Net Premiums Written	Loss & LAE Ratios	Catastrophe Loss Ratios
Core Commercial	**$ 1,999.9**	**68.5**	**9.9**
Specialty	**1,243.7**	**54.0**	**2.8**
Personal Lines:			
Personal automobile	**1,317.2**	**77.3**	**0.7**
Homeowners & Other	**915.7**	**78.6**	**19.8**
Total Personal Lines	**2,232.9**	**77.8**	**8.3**
Total	**$ 5,476.5**	**69.0**	**7.7**

	YEAR ENDED DECEMBER 31, 2021		
(dollars in millions)	Net Premiums Written	Loss & LAE Ratios	Catastrophe Loss Ratios
Core Commercial	$ 1,864.8	67.4	9.7
Specialty	1,118.9	57.4	5.0
Personal Lines:			
Personal automobile	1,230.4	66.0	1.6
Homeowners & Other	779.3	72.6	21.3
Total Personal Lines	2,009.7	68.5	9.1
Total	$ 4,993.4	65.7	8.4

(dollars in millions)	YEAR ENDED DECEMBER 31, 2020 Net Premiums Written	Loss & LAE Ratios	Catastrophe Loss Ratios
Core Commercial	$ 1,726.2	63.2	5.3
Specialty	1,006.9	58.3	4.3
Personal Lines:			
Personal automobile	1,151.5	62.7	1.0
Homeowners & Other	713.9	67.9	20.5
Total Personal Lines	1,865.4	64.7	8.4
Total	$ 4,598.5	62.8	6.3

The following tables summarize GAAP underwriting results for our Core Commercial, Specialty, Personal Lines and Other segments and reconciles them to operating income (loss) before interest expense and income taxes.

(in millions)	YEAR ENDED DECEMBER 31, 2022 Core Commercial	Specialty	Personal Lines	Other	Total
Underwriting profit, excluding prior year reserve development and catastrophes	**$ 154.7**	**$ 137.9**	**$ 80.0**	**$ —**	**$ 372.6**
Prior year favorable (unfavorable) loss and LAE reserve development on non-catastrophe losses	**10.3**	**19.5**	**(8.0)**	**(1.2)**	**20.6**
Prior year favorable (unfavorable) catastrophe development	**17.3**	**8.7**	**(14.0)**	**—**	**12.0**
Current year catastrophe losses	**(211.0)**	**(41.4)**	**(162.2)**	**—**	**(414.6)**
Underwriting profit (loss)	**(28.7)**	**124.7**	**(104.2)**	**(1.2)**	**(9.4)**
Net investment income	**136.2**	**62.1**	**86.8**	**11.2**	**296.3**
Fees and other income	**4.0**	**5.4**	**14.1**	**3.0**	**26.5**
Other operating expenses	**(4.6)**	**(6.2)**	**(5.5)**	**(12.0)**	**(28.3)**
Operating income (loss) before interest expense and income taxes	**$ 106.9**	**$ 186.0**	**$ (8.8)**	**$ 1.0**	**$ 285.1**

(in millions)	YEAR ENDED DECEMBER 31, 2021 Core Commercial	Specialty	Personal Lines	Other	Total
Underwriting profit, excluding prior year reserve development and catastrophes	$ 150.2	$ 105.0	$ 217.3	$ —	$ 472.5
Prior year favorable (unfavorable) loss and LAE reserve development on non-catastrophe losses	17.8	16.2	23.1	(1.0)	56.1
Prior year favorable catastrophe development	9.7	2.3	3.0	—	15.0
Current year catastrophe losses	(185.2)	(54.1)	(178.3)	—	(417.6)
Underwriting profit (loss)	(7.5)	69.4	65.1	(1.0)	126.0
Net investment income	146.5	62.9	89.4	11.9	310.7
Fees and other income	3.3	6.4	9.7	4.5	23.9
Other operating expenses	(4.3)	(6.8)	(5.7)	(11.5)	(28.3)
Operating income before interest expense and income taxes	$ 138.0	$ 131.9	$ 158.5	$ 3.9	$ 432.3

(in millions)	YEAR ENDED DECEMBER 31, 2020 Core Commercial	Specialty	Personal Lines	Other	Total
Underwriting profit (loss), excluding prior year reserve development and catastrophes	$ 134.5	$ 85.0	$ 286.7	$ (0.1)	$ 506.1
Prior year favorable (unfavorable) loss and LAE reserve development on non-catastrophe losses	12.6	6.4	0.7	(4.2)	15.5
Prior year favorable (unfavorable) catastrophe development	14.7	4.1	(1.7)	—	17.1
Current year catastrophe losses	(104.3)	(46.7)	(152.8)	—	(303.8)
Underwriting profit (loss)	57.5	48.8	132.9	(4.3)	234.9
Net investment income	124.2	51.1	76.7	13.1	265.1
Fees and other income	4.3	5.4	10.6	7.0	27.3
Other operating expenses	(7.9)	(8.0)	(7.7)	(19.0)	(42.6)
Operating income (loss) before interest expense and income taxes	$ 178.1	$ 97.3	$ 212.5	$ (3.2)	$ 484.7

2022 Compared to 2021

Core Commercial

Core Commercial net premiums written were $1,999.9 million for the year ended December 31, 2022, compared to $1,864.8 million for the year ended December 31, 2021. This $135.1 million increase was primarily driven by pricing and exposure increases.

Core Commercial underwriting loss for the year ended December 31, 2022 was $28.7 million, compared to $7.5 million for the year ended December 31, 2021, an unfavorable change of $21.2 million. Catastrophe losses for the year ended December 31, 2022 were $193.7 million, compared to $175.5 million for the year ended December 31, 2021, an increase of $18.2 million. Net favorable development on prior years' loss reserves for the year ended December 31, 2022 was $10.3 million, compared to $17.8 million for the year ended December 31, 2021, a decrease of $7.5 million.

Core Commercial current accident year underwriting profit, excluding catastrophes, was $154.7 million for the year ended December 31, 2022, compared to $150.2 million for the year ended December 31, 2021. This $4.5 million increase was primarily due to earned premium growth. Within current accident year non-catastrophe losses, higher loss activity in our commercial multiple peril and commercial automobile lines were partially offset by lower loss activity in our workers' compensation and miscellaneous property lines.

We continue to manage underwriting performance through rate actions, pricing segmentation, specific underwriting actions and targeted new business growth. Our ability to achieve overall rate increases is affected by many factors, including regulatory activity and the competitive pricing environment, particularly within the workers' compensation line. See "Contingencies and Regulatory Matters." Due to uncertainty caused by the increase in inflation and supply chain disruptions, there is a level of uncertainty in our ability to grow our business and maintain or improve our underwriting profitability in this environment. The extent and duration of these uncertainties are unknown and have resulted in an increase in claims costs, which may persist, and may also result in reduced premium levels.

Specialty

Specialty net premiums written were $1,243.7 million for the year ended December 31, 2022, compared to $1,118.9 million for the year ended December 31, 2021. This $124.8 million increase was primarily due to pricing, new business and exposure increases.

Specialty underwriting profit for the year ended December 31, 2022 was $124.7 million, compared to $69.4 million for the year ended December 31, 2021, an increase of $55.3 million. Catastrophe losses for the year ended December 31, 2022 were $32.7 million, compared to $51.8 million for the year ended December 31, 2021, a decrease of $19.1 million. The higher catastrophe losses in 2021 were primarily due to freeze events in Texas and surrounding states. Net favorable development on prior years' loss reserves for the year ended December 31, 2022 was $19.5 million, compared to $16.2 million for the year ended December 31, 2021, an increase of $3.3 million.

Specialty current accident year underwriting profit, excluding catastrophes, was $137.9 million for the year ended December 31, 2022, compared to $105.0 million for the year ended December 31, 2021, an increase of $32.9 million, primarily due to earned premium growth and lower current accident year losses. Within current accident year losses, lower losses in Specialty P&C and Professional and Executive Lines were partially offset by higher losses in the inland marine line.

We continue to manage underwriting performance through rate actions, pricing segmentation, specific underwriting actions and targeted new business growth. Our ability to achieve overall rate increases is affected by many factors, including regulatory activity and the competitive pricing environment. See "Contingencies and Regulatory Matters." Due to uncertainty caused by the increase in inflation and supply chain disruptions, there is a level of uncertainty in our ability to grow our business and maintain or improve our underwriting profitability in this environment. The extent and duration of these uncertainties are unknown and may result in an increase in claims costs and reduced premium levels.

Personal Lines

Personal Lines net premiums written were $2,232.9 million for the year ended December 31, 2022, compared to $2,009.7 million for the year ended December 31, 2021. This $223.2 million increase was primarily driven by renewal price increases and, to a lesser extent, higher new business.

Net premiums written in the personal automobile line of business for the year ended December 31, 2022 were $1,317.2 million, compared to $1,230.4 million for the year ended December 31, 2021, an increase of $86.8 million. Personal automobile policies in force increased 5.8%. Net premiums written in the homeowners and other lines of business for the year ended December 31, 2022 were $915.7 million, compared to $779.3 million for the year ended December 31, 2021, an increase of $136.4 million. Homeowners policies in force increased 5.6%.

Personal Lines underwriting loss for the year ended December 31, 2022 was $104.2 million, compared to underwriting profit of $65.1 million for the year ended December 31, 2021, an unfavorable change of $169.3 million. Catastrophe losses for the year ended December 31, 2022 were $176.2 million, compared to $175.3 million for the year ended December 31, 2021, an increase of $0.9 million. Unfavorable development on prior years' loss reserves for the year ended December 31, 2022 was $8.0 million, compared to favorable development of $23.1 million for the year ended December 31, 2021, an unfavorable change of $31.1 million.

Personal Lines current accident year underwriting profit, excluding catastrophes, was $80.0 million for the year ended December 31, 2022, compared to $217.3 million for the year ended December 31, 2021. This $137.3 million decrease was primarily due to higher current accident year loss severity in our personal automobile and homeowners lines, partially offset by earned premium growth and lower performance-based agency compensation expenses. We experienced an increase in personal automobile physical damage and property loss frequency compared to the unusually low levels experienced in 2021, as well as an increase in loss severity, driven by inflationary pressures associated with supply chain issues, higher used vehicle prices, and higher cost of parts and other repair costs. In addition, homeowners losses have increased due to higher property severity as a result of higher inflation and higher than usual frequency of large loss activity and non-weather water-related losses. We have experienced inflationary pressures on building material and labor costs, supply chain constraints that increase building and repair times, and increases in lodging and additional living expense reimbursements.

We have been able to obtain rate increases in our Personal Lines markets and believe that our ability to obtain increases will continue over the long-term. Our ability to maintain Personal Lines net premiums written may be affected, however, by price competition, and regulatory and legal activity and developments. See "Contingencies and Regulatory Matters." Additionally, these factors, along with the aforementioned issues contributing to our recent increase in losses, may also affect our ability to maintain and improve underwriting results. We monitor these trends and consider them in our rate actions. Due to uncertainty caused by the increase in inflation and supply chain disruptions, there is a level of uncertainty in our ability to retain or grow our business and may result in a continued increase in claims costs.

Other

Our Other segment had operating income of $1.0 million for the year ended December 31, 2022, compared to $3.9 million for the year ended December 31, 2021, a decrease of $2.9 million.

2021 Compared to 2020

Core Commercial

Core Commercial net premiums written were $1,864.8 million for the year ended December 31, 2021, compared to $1,726.2 million for the year ended December 31, 2020, an increase of $138.6 million. This increase was primarily driven by an increase in rate and exposure activity following the reduction in insured business in 2020 as a result of the Pandemic.

Core Commercial underwriting loss for the year ended December 31, 2021 was $7.5 million, compared to underwriting profit of $57.5 million for the year ended December 31, 2020, a decrease of $65.0 million. Catastrophe losses for the year ended December 31, 2021 were $175.5 million, compared to $89.6 million for the year ended December 31, 2020, an increase of $85.9 million, primarily due to freeze events in Texas and surrounding states associated with record low temperatures in the first quarter of 2021 and hurricane Ida and several wind and hailstorms in the Midwest in the third quarter of 2021. Favorable development on prior years' loss reserves for the year ended December 31, 2021 was $17.8 million, compared to $12.6 million for the year ended December 31, 2020, an increase of $5.2 million.

Core Commercial current accident year underwriting profit, excluding catastrophes, was $150.2 million for the year ended December 31, 2021, compared to $134.5 million for the year ended December 31, 2020. This $15.7 million increase was primarily due to earned premium growth, partially offset by higher current accident year non-catastrophe losses. The higher non-catastrophe losses were primarily driven by higher loss activity in our commercial multiple peril line.

Specialty

Specialty net premiums written were $1,118.9 million for the year ended December 31, 2021, compared to $1,006.9 million for the year ended December 31, 2020, an increase of $112.0 million. This increase was primarily driven by favorable new business activity and an increase in rate and exposure activity following the reduction in insured business in 2020 as a result of the Pandemic.

Specialty underwriting profit for the year ended December 31, 2021 was $69.4 million, compared to $48.8 million for the year ended December 31, 2020, an increase of $20.6 million. Catastrophe losses for the year ended December 31, 2021 were $51.8 million, compared to $42.6 million for the year ended December 31, 2020, an increase of $9.2 million. Favorable development on prior years' loss reserves for the year ended December 31, 2021 was $16.2 million, compared to $6.4 million for the year ended December 31, 2020, an increase of $9.8 million.

Specialty current accident year underwriting profit, excluding catastrophes, was $105.0 million for the year ended December 31, 2021, compared to $85.0 million for the year ended December 31, 2020. This $20.0 million increase was primarily due to earned premium growth and lower expenses.

Personal Lines

Personal Lines net premiums written were $2,009.7 million for the year ended December 31, 2021, compared to $1,865.4 million for the year ended December 31, 2020, an increase of $144.3 million. During the second quarter of 2020, we returned approximately $30 million of premiums to our eligible Personal Lines customers in all our markets, providing financial relief during the Pandemic. In addition, net premiums written grew due to increased new business, retention and, to a lesser extent, renewal rate increases.

Net premiums written in the personal automobile line of business for the year ended December 31, 2021 were $1,230.4 million, compared to $1,151.5 million for the year ended December 31, 2020, an increase of $78.9 million. Personal automobile policies in force increased 6.1%. Net premiums written in the homeowners and other lines of business for the year ended December 31, 2021 were $779.3 million, compared to $713.9 million for the year ended December 31, 2020, an increase of $65.4 million. Homeowners policies in force increased 6.0%.

Personal Lines underwriting profit for the year ended December 31, 2021 was $65.1 million, compared to $132.9 million for the year ended December 31, 2020, a decrease of $67.8 million. Catastrophe losses for the year ended December 31, 2021 were $175.3 million, compared to $154.5 million for the year ended December 31, 2020. This $20.8 million increase was primarily due to several wind and hailstorms throughout the Midwest and hurricane Ida during the third quarter of 2021. Favorable development on prior years' loss reserves for the year ended December 31, 2021 was $23.1 million, compared to $0.7 million for the year ended December 31, 2020, an increase of $22.4 million.

Personal Lines current accident year underwriting profit, excluding catastrophes, was $217.3 million for the year ended December 31, 2021, compared to $286.7 million for the year ended December 31, 2020. This $69.4 million decrease was primarily due to higher current accident year losses and higher expenses, primarily due to a non-recurring premium tax benefit in 2020, partially offset by earned premium growth. The higher current accident year losses in 2021 were attributable to higher personal automobile loss severity and frequency, though 2021 loss frequency was below pre-Pandemic levels. In addition, there were increased weather-related losses in the homeowners line in 2021.

Other

Our Other segment had operating income of $3.9 million for the year ended December 31, 2021, compared to an operating loss of $3.2 million for the year ended December 31, 2020, a favorable change of $7.1 million. This improvement was primarily due to lower charitable contributions in 2021, compared to the elevated level in 2020. In addition, prior year's results included a $3.3 million reserve increase, based on the receipt of an updated third-party actuarial study for the legacy Excess and Casualty Reinsurance Association ("ECRA") pool.

RESERVE FOR LOSSES AND LOSS ADJUSTMENT EXPENSES

Overview of Loss Reserve Estimation Process

We maintain reserves for our insurance products to provide for our ultimate liability for losses and loss adjustment expenses (our "loss reserves") with respect to reported and unreported claims incurred as of the end of each accounting period. These reserves are estimates, taking into account past loss experience, modified for current trends, as well as prevailing economic, legal and social conditions. Loss reserves represent our largest liability.

Management's process for establishing loss reserves is a comprehensive process that involves input from multiple functions throughout our organization, including actuarial, finance, claims, legal, underwriting, distribution, and business operations management. The process incorporates facts currently known, as well as the current, and in some cases, the anticipated, state of the law and coverage litigation. Based on information currently available, we believe that the aggregate loss reserves at December 31, 2022 were adequate to cover claims for losses that had occurred as of that date, including both those known to us and those yet to be reported. However, as described below, there are significant uncertainties inherent in the loss reserving process. Our estimate of the ultimate liability for losses that had occurred as of December 31, 2022 is expected to change in future periods as we obtain further information, and such changes could have a material effect on our results of operations and financial position.

Our loss reserves include case estimates for claims that have been reported and estimates for claims that have been incurred but not reported ("IBNR") at the balance sheet date. They also include estimates of the expenses associated with processing and settling all reported and unreported claims, less estimates of anticipated salvage and subrogation recoveries. Our loss reserves are not discounted to present value.

Case reserves are established by our claim personnel individually, on a claim by claim basis, and based on information specific to the occurrence and terms of the underlying policy. For some classes of business, average case reserves are used initially. Case reserves are periodically reviewed and modified based on new or additional information pertaining to the claim.

Our ultimate IBNR reserves are estimated by management and our reserving actuaries on an aggregate basis for each line of business or coverage for loss and loss expense liabilities not reflected within the case reserves. The sum of the case reserves and the IBNR reserves represents our estimate of total unpaid losses and loss adjustment expenses.

We regularly review our loss reserves using a variety of industry accepted analytical techniques. We update the loss reserves as historical loss experience develops, additional claims are reported and resolved, and new information becomes available. Net changes in loss reserves are reflected in operating results in the period in which the reserves are changed.

The IBNR reserve includes both a provision for claims that have occurred but have not yet been reported to us, some of which may not yet be known to the insured, and a provision for future development on reported claims. IBNR represents a significant proportion of our total net loss reserves, particularly for long-tail liability classes. In fact, approximately 52% of our aggregate net loss reserves at December 31, 2022 were for IBNR losses and loss expenses.

Critical Judgments and Key Assumptions

We determine the amount of our net loss reserves (i.e., net of estimated reinsurance recoverables) based on an estimation process that is complex and considers information from both company specific and industry data, as well as general economic and other information. The estimation process utilizes a combination of objective and subjective information, the blending of which requires significant professional judgment. There are various assumptions required, including future trends in frequency and severity of claims, operational changes in claim handling and case reserving practices, and trends related to general economic and social conditions. Informed judgments as to our ultimate exposure to losses are an integral component of our loss reserve estimation process.

There is greater inherent uncertainty in estimating insurance reserves for certain types of property and casualty insurance lines, particularly liability lines, where a longer period of time may elapse before a definitive determination of ultimate liability and losses may be made (sometimes referred to as "long-tail" business). In addition, the technological, judicial, regulatory and political climates involving these types of claims are continuously evolving. The emergence of the Pandemic during 2020 resulted in an increased level of uncertainty for many lines of business, particularly for our long-tail lines. There is also greater uncertainty in establishing reserves with respect to business that is new to us, particularly new business which is generated with respect to newly introduced product lines, by newly appointed agents or in geographies in which we have less experience in conducting business. In each of these cases, there is less historical experience or knowledge, and less data upon which we can rely. A combination of business that is both new to us and has longer development periods provides even greater uncertainty in estimating insurance reserves. In addition, in recent periods, we have experienced extensions of the "tails" in certain lines of business as the full value of claims are presented later than had been our historical experience. The broad impact of the Pandemic on our claims environment may extend these "tails" even further. For example, there have been delays in medical treatments, submission of medical expenses, and deferment of elective medical procedures, which may have worsened insureds' health status, and which may result in an increase in our ultimate loss costs. Also, presumptive orders by relevant state authorities may potentially increase workers' compensation exposures beyond contractual obligations.

We regularly update our reserve estimates as new information becomes available and additional events occur which may impact the resolution of unsettled claims. Reserve adjustments are reflected in the results of operations as adjustments to losses and LAE. Often, these adjustments are recognized in periods subsequent to the period in which the underlying policy was written and the loss event occurred. When these types of subsequent adjustments affect prior years, they are described separately as "prior year reserve development." Such development can be either favorable or unfavorable to our financial results and may vary by line of business. As discussed below, estimated loss and LAE reserves for claims occurring in prior years, in the aggregate, developed favorably by $20.6 million, $56.1 million and $15.5 million for the years ended December 31, 2022, 2021 and 2020, respectively, although there was some significant variance by segment. Additionally, our estimated loss and LAE reserves for catastrophe claims occurring in prior years developed favorably by $12.0 million, $15.0 million and $17.1 million for the years ended December 31, 2022, 2021 and 2020, respectively. There can be no assurance that current loss and LAE reserves will be sufficient.

We regularly review our reserving techniques, our overall reserving position and our reinsurance. Based on (i) our review of historical data, legislative enactments, judicial decisions, legal developments in impositions of damages and policy coverage, political attitudes and trends in general economic conditions, (ii) our review of per claim information, (iii) our historical loss experience and that of the industry, (iv) the nature of policies written by us, and (v) our internal estimates of required reserves, we believe that adequate provision has been made for loss reserves. Given the inherent complexity of our loss reserve estimation process and the potential variability of the assumptions used, the actual emergence of losses will vary, perhaps substantially, from the estimate of losses included in our financial statements, particularly in those instances where settlements or other claim resolutions do not occur until well into the future. Our net loss reserves at December 31, 2022 were $5.3 billion. Therefore, a relatively small percentage change in the estimate of net loss reserves would have a material effect on our results of operations. Similarly, a one percentage point change in the aggregate loss and LAE ratio resulting from a change in reserve estimation is currently projected to have an approximate $53 million impact on operating income, based on 2022 full year premiums written.

The major causes of material uncertainty relating to ultimate losses and LAE ("risk factors") generally vary for each line of business, as well as for each separately analyzed component of the line of business. In some cases, such risk factors are explicit assumptions of the estimation method and in others, they are implicit. For example, a method may explicitly assume that a certain percentage of claims will close each year, but will implicitly assume that the legal interpretation of existing contract language will remain substantially unchanged. Actual results will likely vary from expectations for each of these assumptions, resulting in an ultimate claim liability that is different from that being estimated currently.

Some risk factors affect multiple lines of business. Examples include changes in claim handling and claim reserving practices, changes in claim settlement patterns due to the Pandemic and other factors, regulatory and legislative actions, court actions, so-called "social inflation," timeliness of claim reporting, state mix of claimants and degree of claimant fraud. The extent of the impact of a risk factor will also vary by components within a line of business. Individual risk factors are subject to interactions with other risk factors within line of business components. Thus, risk factors can have offsetting or compounding effects on required reserves.

Inflation generally increases the cost of losses covered by insurance contracts. The effect of inflation varies by product. Our insurance premiums are established before the amount of losses and LAE and the extent to which inflation may affect such expenses are known. Consequently, we attempt, in establishing rates and reserves, to anticipate the potential impact of inflation in the projection of ultimate costs. For example, we monitor, and continue to experience, increases in medical costs, wages, and legal costs, all of which are key considerations in setting reserve assumptions for workers' compensation, bodily injury and other liability lines. We are also monitoring the continued advancements in technology and design found in automobiles and homes, and the increased claims settlement costs that result from labor shortages, and repairs or replacement of such equipment impacted by supply chain disruptions, which could lead to material shortages and elevated prices of building materials. Estimated increases are reflected in our current reserve estimates, but continued increases are expected to contribute to increased losses and LAE in the future.

We are also defendants in various litigation matters, including putative class actions, which may seek punitive damages, bad faith or extra-contractual damages, legal fees and interest, or claim a broader scope of policy coverage or settlement and payment obligations than our interpretation. Resolution of these cases is often highly unpredictable and could involve material unanticipated damage awards. We have experienced, and others in the industry have reported, increased attorney involvement in claims including Pandemic-related matters, delayed submissions of medical and other expense claims, court closures resulting in delayed claim settlements, and a trend toward higher valued settlements and litigation, all of which contribute to uncertainty regarding reserve estimates.

Loss and LAE Reserves by Line of Business

Reserving Process Overview

Our loss reserves include amounts related to short-tail and long-tail classes of business. "Tail" refers to the time period between the occurrence of a loss and the final settlement of the claim. The longer the time span between the incidence of a loss and the settlement of the claim (i.e., a longer tail), the more the ultimate settlement amount may likely vary from our original estimate.

Short-tail classes consist principally of automobile physical and property damage, commercial property, homeowners property and marine business. For these property coverages, claims are generally reported and settled shortly after the loss occurs because the claims relate to tangible property and are more likely to be discovered shortly after the loss occurs. Consequently, the estimation of loss reserves for these classes is generally less complex. However, the estimation of loss reserves for these classes is more complex during periods of persistent supply chain disruptions and significant inflation in the U.S. economy, as was experienced during 2022.

While we estimate that approximately half of our written premium is in, what we would characterize as, shorter-tail classes of business, most of our loss reserves relate to longer-tail liability classes of business. Long-tailed classes include automobile liability, commercial liability, third-party coverage and workers' compensation. For many liability claims, significant periods of time, ranging up to several years or more, may elapse between the occurrence of the loss, the discovery and reporting of the loss to us and the settlement of the claim. As a result, loss experience in the more recent accident years for long-tailed liability coverage has limited statistical credibility because a relatively small proportion of losses in these accident years (the calendar years in which losses are incurred) are reported claims and an even smaller proportion are paid losses. Liability claims are also more susceptible to litigation and can be significantly affected by changing contract interpretations, the legal, political and social environment, the risk and expense of protracted litigation, and inflation. Consequently, the estimation of loss reserves for these coverages is more complex and typically subject to a higher degree of variability and uncertainty compared to short-tailed coverages.

Most of our indirect business from our run-off voluntary and ongoing involuntary pools is assumed long-tailed casualty reinsurance. Reserve estimates for this business are therefore subject to the variability caused by extended loss emergence periods. The estimation of loss reserves for this business is further complicated by delays between the time the claim is reported to the ceding insurer and when it is reported by the ceding insurer to the pool manager and then to us, and by our dependence on the quality and consistency of the loss reporting by the ceding company and actuarial estimates by the pool manager. These reserving factors also apply to our discontinued assumed accident and health reinsurance pools and arrangements that are included in our liabilities of discontinued businesses (See "Risk Factors" in Part I – Item 1A for further discussion).

A review of loss reserves for each of the classes of business in which we write is conducted regularly, generally quarterly. This review process takes into consideration a variety of trends that impact the ultimate settlement of claims. Where appropriate, the review includes a review of overall payment patterns and the emergence of paid and reported losses relative to expectations.

The loss reserve estimation process relies on the basic assumption that past experience, adjusted for the effects of current developments and likely trends, is an appropriate basis for predicting future outcomes. As part of this process, we use a variety of analytical methods that consider experience, trends and other relevant factors. IBNR reserves are generally calculated by first projecting the ultimate cost of all claims that have been reported or expected to be reported in the future and then subtracting reported losses and loss expenses. Reported losses include cumulative paid losses and loss expenses plus case reserves. Within the loss reserving process, standard actuarial methods which include: (1) loss development factor methods; (2) expected loss methods (Bornheutter-Ferguson); and (3) adjusted loss methods (Berquist-Sherman), are given due consideration. These methods are described below:

- Loss development factor methods generally assume that the losses yet to emerge for an accident year are proportional to the paid or reported loss amount observed to date. Historical patterns of the development of paid and reported losses by accident year can be predictive of the expected future patterns that are applied to current paid and reported losses to generate estimated ultimate losses by accident year.
- Bornheutter-Ferguson methods utilize the product of the expected ultimate losses times the proportion of ultimate losses estimated to be unreported or unpaid to calculate IBNR. The expected ultimate losses are based upon current estimates of ultimate losses from prior accident years, adjusted to reflect expected earned premium, current rating, claims cost levels and changes in business mix. The expected losses, and corresponding loss ratios, are a critical component of Bornheutter-Ferguson methodologies and provide a general reasonability guide.
- Berquist-Sherman methods are used for estimating reserves in business lines where historical development patterns may be deemed less reliable for more recent accident years' ultimate losses. Under these methods, patterns of historical paid or reported losses are first adjusted to reflect current payment settlement patterns and case reserve adequacy and then evaluated in the same manner as the loss development factor methods described above. When the adequacy of case reserves change, the Berquist-Sherman incurred method may be deemed more reliable than the reported loss development factor method. Likewise, when the settlement patterns change, the Berquist-Sherman paid method may be deemed more reliable than the paid loss development factor method.

In addition to the methods described above, various tailored reserving methodologies are used for certain businesses. For example, for some low volume and high volatility classes of business, special reserving techniques are utilized that estimate IBNR by selecting the loss ratio that balances actual reported losses to expected reported losses as defined by the estimated underlying reporting pattern. Also, for some classes with long exposure periods (e.g., construction defect, engineering and surety), earnings patterns plus an estimated reporting lag applied to the Bornheutter-Ferguson initial expected loss ratio are used to estimate IBNR. This is done in order to reflect the changing average exposure periods by policy year (and consequently accident year).

In completing the loss reserve analysis, a variety of assumptions must be made for each line of business, coverage and accident year. Each estimation method has its own pattern, parameter and/or judgmental dependencies, with no estimation method being better than the others in all situations. The relative strengths and weaknesses of the various estimation methods, when applied to a particular class of business, can also change over time, depending on the underlying circumstances. In many cases, multiple estimation methods will be valid for the particular facts and circumstances of the relevant class of business. The manner of application and the degree of reliance on a given method will vary by line of business and coverage, and by accident year based on an evaluation of the above dependencies and the potential volatility of the loss frequency and severity patterns. The estimation methods selected or given weight at a particular valuation date are those that are believed to produce the most reliable indication for the loss reserves being evaluated. Selections incorporate input from claims personnel, pricing actuaries, and underwriting management on loss cost trends and other factors that could affect ultimate losses.

For most classes of shorter-tailed business in our Core Commercial, Specialty and Personal Lines segments, the emergence of paid and incurred losses generally exhibits a relatively stable pattern of loss development from one accident year to the next. Thus, for these classes, the loss development factor method is generally appropriate. For some of the classes of shorter-tailed business, the emergence of paid and incurred losses may exhibit a relatively volatile pattern of loss development from one accident year to the next. In these cases where there is a relatively low level of reliability placed on the available paid and incurred loss data, expected loss methods or adjusted loss methods are considered appropriate for the most recent accident year.

For longer-tailed lines of business, applying the loss development factor method often requires even more judgment in selecting development factors, as well as more significant extrapolation. For those long-tailed lines of business with high frequency and relatively low per-loss severity (e.g., personal automobile liability), volatility will often be sufficiently modest for the loss development factor method to be given significant weight, even in the most recent accident years, but expected loss methods and adjusted loss methods are always considered and frequently utilized in the selection process. For those long-tailed lines of business with low frequency and high loss potential (e.g., commercial general liability), anticipated loss experience is less predictable because of the small number of claims and erratic claim severity patterns. In these situations, the loss development factor methods may not produce a reliable estimate of ultimate losses in the most recent accident years since many claims either have not yet been reported or are only in the early stages of the settlement process. Therefore, the loss reserve estimates for these accident years may be based on methods less reliant on

extrapolation, such as Bornheutter-Ferguson. Over time, as a greater number of claims are reported and the statistical credibility of loss experience increases, loss development factor methods or adjusted loss methods are given increasing weight.

Management endeavors to apply as much available data as practicable to estimate the loss reserve amount for each line of business, coverage and accident year, utilizing varying assumptions, projections and methods. The ultimate outcome is expected to fall within a range of potential outcomes around this loss reserve estimated amount.

Our carried reserves for each line of business and coverage are determined based on our quarterly loss reserving process. In making the determination, we consider numerous quantitative and qualitative factors. Quantitative factors include changes in reserve estimates in the period, the maturity of the accident year, trends observed over the recent past, the level of volatility within a particular class of business, the estimated effects of reinsurance, including reinstatement premiums, general economic trends, and other factors. Qualitative factors may include legal and regulatory developments, changes in claim handling and case reserving practices, recent entry into new markets or products, changes in underwriting practices or business mix, concerns that we do not have sufficient or quality historical reported and paid loss and LAE information with respect to a particular line or segment of our business, effects of the economy and political outlook, perceived anomalies in the historical results, evolving trends or other factors, such as the impact of the Pandemic. In doing so, we must evaluate whether a change in the data represents credible actionable information or an anomaly. Such an assessment requires considerable judgment. Even if a change is determined to be apparent, it is not always possible to determine the extent of the change. As a result, there can be a time lag between the emergence of a change and a determination that the change should be partially or fully reflected in the carried loss reserves. In general, changes are made more quickly to reserves for more mature accident years and less volatile classes of business.

Reserving Process Uncertainties

As stated above, numerous factors (both internal and external) contribute to the inherent uncertainty in the process of establishing loss reserves, including changes in the rate of inflation for goods and services related to insured damages (e.g., medical care, home and automobile repairs, etc.), changes in the judicial interpretation of policy provisions and settlement obligations, changes in the general attitude of juries in determining damage awards, legislative actions, such as expanding liability, coverage mandates or expanding or suspending statutes of limitations which otherwise limit the times within which claims can be made, changes in the extent of insured injuries, changes in the trend of expected frequency and/or severity of claims, changes in our book of business (e.g., change in mix due to new or modified product offerings, new or rapidly expanding geographic areas, etc.), changes in our underwriting practices, and changes in claim handling procedures and/or systems. Regarding our indirect business from voluntary and involuntary pools, we are periodically provided loss estimates by managers of each pool. We adopt reserve estimates for the pools that consider this information and other facts.

In addition, we must consider the uncertain effects of emerging or potential claims and coverage issues that arise as legal, judicial and social conditions, political risks, and economic conditions change. For example, claims which we consider closed may be re-opened as additional damages surface or new liability or damage theories are presented. Also, historically, we have observed more frequent and higher severity in workers' compensation, bodily injury and other liability claims and more credit-related losses (for example, in our surety business) during periods of economic uncertainty or high unemployment. Economic and labor force dynamics have resulted in many experienced workers retiring from their positions, who have been replaced with newly skilled workers, which could result in more workplace accidents. These, and other issues, could have a negative effect on our loss reserves by either extending coverage beyond the original underwriting intent or by increasing the number or size of claims.

As part of our loss reserving analysis, we consider the various factors that contribute to the uncertainty in the loss reserving process. Those factors that could materially affect our loss reserve estimates include loss development patterns and loss cost trends, reporting lags, rate and exposure level changes, the effects of changes in coverage and policy limits, business mix shifts, the effects of regulatory and legislative developments, economic circumstances, the effects of changes in judicial interpretations, the effects of emerging claims and coverage issues, and the effects of changes in claim handling and claim reserving practices. In making estimates of reserves, however, we do not necessarily make an explicit assumption for each of these factors. Moreover, all estimation methods do not utilize the same assumptions and typically no single method is determinative in the reserve analysis for a line of business and coverage. Consequently, changes in our loss reserve estimates generally are not the result of changes in any one assumption. Instead, the variability will be affected by the interplay of changes in numerous assumptions, many of which are implicit to the approaches used.

For each line of business and coverage, we regularly adjust the assumptions and methods used in the estimation of loss reserves in response to our actual loss experience, as well as our judgments regarding changes in trends and/or emerging patterns. In those instances where we primarily utilize analyses of historical patterns of the development of paid and reported losses, this may be reflected, for example, in the selection of revised loss development factors. In longer-tailed classes of business and for which loss experience is less predictable due to potential changes in judicial interpretations, potential legislative actions, the cost of litigation or determining liability and the ultimate loss, inflation, potential claims, shifting claim settlement patterns due to delayed court proceedings, and other issues, this may be reflected in a judgmental change in our estimate of ultimate losses for particular accident years. Most of the insurance policies we have written over many years are written on an "occurrence" basis, which means we insure specified acts or events which occurred during the covered period, even if claims first arise from such events many years later. For example, the industry incurred

significant losses as a result of claims arising from asbestos and environmental damage which occurred decades ago and was not known at such time, and in many cases policy limits were available for each year during which such occurrence policies were in place.

Uncertainties with respect to the impact of the Pandemic could have a material adverse effect on our carried loss reserves. While we believe that our in-force Core Commercial and Specialty policies in large part do not cover business interruption losses related to the Pandemic, legislation has been discussed and introduced to retroactively amend insurance contracts to provide business interruption coverage, to impose presumptions on insurance policy interpretation, and/or limit policy exclusions for losses allegedly related to the Pandemic. If these changes were to be enacted and upheld, we would be exposed to a significant unfunded liability.

The future impact of the various factors that contribute to the uncertainty in the loss reserving process is impossible to predict. There is potential for significant variation in the development of loss reserves, particularly for long-tailed classes of business and classes of business that are more vulnerable to economic or political risks.

Reserving Process for Catastrophe Events

The estimation of claims and claims expense reserves for catastrophes is also comprised of estimates of losses from reported claims and IBNR, primarily for damage to property. In general, our estimates for catastrophe reserves are determined on an event basis by considering various sources of available information, including specific loss estimates reported to us based on claim adjuster inspections, overall industry loss estimates, our internal data regarding exposures related to the geographical location of the event and estimates of potential subrogation recoveries. However, depending on the nature of the catastrophe, the estimation process can be further complicated by other impediments. For example, for hurricanes and other severe wind storms and wildfires, complications often include the inability of insureds to promptly report losses, delays in the ability of claims adjusting staff to inspect losses, difficulties in determining whether wind storm losses are covered by our homeowners policy (generally for damage caused by wind or wind driven rain) or are specifically excluded from coverage caused by flood, challenges in estimating additional living expenses, assessing the impact of demand surge, exposure to mold or smoke damage, and the effects of numerous other considerations. Another example is the complication of estimating the cost of business interruption coverage on Core Commercial and Specialty policies. Estimates for catastrophes which occur at or near the end of a financial reporting period, for example Winter Storm Elliott in December 2022, may be even less reliable since we will have less claims data available and little time to complete our estimation process. In such situations, we may adapt our practices to accommodate the circumstances.

For events designated as catastrophes, we generally calculate IBNR reserves directly as a result of an estimated IBNR claim count and an estimated average claim amount for each event. Such an assessment involves a comprehensive analysis of the nature of the event, of policyholder exposures within the affected geographic area and of available claims intelligence. Depending on the nature of the event, available claims intelligence could include surveys of field claims associates within the affected geographic area, aerial photographs of the affected area, feedback from a catastrophe claims team sent into the area, as well as data on claims reported as of the financial statement date. In addition, loss emergence from similar historical events is compared to the estimated IBNR for our current catastrophe events to help assess the reasonableness of our estimates. However, in some cases, it may be difficult to estimate certain catastrophe losses which are unique and do not have instances of historical precedence, such as the property damage arising from the 2020 riots and civil unrest.

Reserving Sensitivity Analysis

The following discussion presents disclosure related to possible variation in net reserve estimates (i.e., net of estimated reinsurance recoverables) due to changes in key assumptions. This information is provided for illustrative purposes only. Many other assumptions may also lead to material reserve adjustments. If any such variations do occur, then they would likely occur over a period of several years and therefore their impact on our results of operations would be recognized during the same periods. It is important to note, however, that there is the potential for future variations greater than the amounts described below and for any such variations to be recognized in a single quarterly or annual period. No consideration has been given to potential correlation or lack of correlation among key assumptions or among lines of business and coverage as described below. As a result, and because there are so many other factors which affect our net reserve estimate, it would be inappropriate to take the amounts described below and simply add them together in an attempt to estimate volatility in total. While we believe these are reasonably possible scenarios, the following sensitivity analysis is not illustrative of a net reserve range.

- Personal and Commercial Automobile Bodily Injury – loss reserves recorded for bodily injury on voluntary business were $845.6 million as of December 31, 2022. A key assumption for bodily injury is the inflation rate underlying the estimated reserve. A five point change (e.g., 3% changed to 8% or -2%) in the embedded inflation rate would have changed total reserves by approximately $85 million, either positive or negative, at December 31, 2022.

- Personal Automobile Personal Injury Protection Medical Payment – loss reserves recorded for personal injury protection medical payment on voluntary business were $122.0 million as of December 31, 2022, of which approximately 90% relate to Michigan policies. A key assumption for this coverage is the inflation rate underlying the estimated reserve. Given the long reporting pattern for this line of business, an additional key assumption is the amount of additional development required to reach full maturity, thereby reflecting ultimate costs, as represented by the tail factor. A five point change in the embedded inflation rate (e.g., 6% changed to 11% or 1%) and a one point change to the tail factor assumption (e.g., 1% changed to 0% or 2%) would have changed total reserves by approximately $42 million, either positive or negative, at December 31, 2022.

- Workers' Compensation – loss reserves recorded for workers' compensation on voluntary business were $481.2 million as of December 31, 2022. A key assumption for workers' compensation is the inflation rate underlying the estimated reserve. Given the long reporting pattern for this line of business, an additional key assumption is the amount of additional development required to reach full maturity, thereby reflecting ultimate costs, as represented by the tail factor. A five point change in the embedded inflation rate (e.g., 4% changed to 9% or -1%) and a one point change to the tail factor assumption (e.g., 2% changed to 1% or 3%) would have changed total reserves by approximately $156 million, either positive or negative, at December 31, 2022.

- Monoline and Multiple Peril General Liability – loss reserves recorded for monoline and multiple peril general liability on voluntary business were approximately $1.1 billion as of December 31, 2022. A key assumption for monoline and multiple peril general liability is the implied adequacy of the underlying case reserves. A ten point change in case adequacy (e.g., 10% deficiency changed to 0% or 20% deficiency) would have changed total reserves by approximately $138 million, either positive or negative, at December 31, 2022.

- Specialty Programs - loss reserves recorded for Hanover Programs were $303.2 million as of December 31, 2022. Two key assumptions underlying the actuarial reserve analysis for specialty programs are the inflation rate underlying the estimated reserve for our commercial automobile liability, general liability and workers' compensation coverages, as well as the tail factor selection for workers' compensation. A five point change to the embedded inflation rate for the aforementioned coverages (e.g., 4% changed to 9% or -1%), and a one point change in the workers' compensation tail factor on Hanover Programs (e.g., 0.1% changed to 1.1% or -0.9%) would have changed total reserves by approximately $57 million, either positive or negative, at December 31, 2022.

Carried Reserves and Reserve Rollforward

The following table provides a reconciliation of the gross beginning and ending reserve for unpaid losses and loss adjustment expenses.

YEARS ENDED DECEMBER 31 *(in millions)*	2022	2021	2020
Gross reserve for losses and LAE, beginning of year	**$ 6,447.6**	$ 6,024.0	$ 5,654.4
Reinsurance recoverable on unpaid losses	**1,693.8**	1,641.6	1,574.8
Net reserve for losses and LAE, beginning of year	**4,753.8**	4,382.4	4,079.6
Net incurred losses and LAE in respect of losses occurring in:			
Current year	**3,656.0**	3,205.3	2,877.8
Prior year non-catastrophe development	**(20.6)**	(56.1)	(15.5)
Prior year catastrophe development	**(12.0)**	(15.0)	(17.1)
Total incurred losses and LAE	**3,623.4**	3,134.2	2,845.2
Net payments of losses and LAE in respect of losses occurring in:			
Current year	**1,578.9**	1,464.1	1,347.7
Prior years	**1,534.3**	1,298.7	1,194.7
Total payments	**3,113.2**	2,762.8	2,542.4
Net reserve for losses and LAE, end of year	**5,264.0**	4,753.8	4,382.4
Reinsurance recoverable on unpaid losses	**1,748.6**	1,693.8	1,641.6
Gross reserve for losses and LAE, end of year	**$ 7,012.6**	$ 6,447.6	$ 6,024.0

The following table summarizes the gross reserve for losses and LAE by line of business and division.

DECEMBER 31 *(in millions)*	2022	2021	2020
Commercial multiple peril	**$ 1,556.6**	$ 1,338.4	$ 1,183.9
Workers' compensation	**735.0**	698.5	676.6
Commercial automobile	**477.7**	473.1	445.0
Other core commercial	**581.6**	481.0	421.5
Total Core Commercial	**3,350.9**	2,991.0	2,727.0
Specialty Property & Casualty	**820.6**	798.6	681.7
Professional and Executive Lines	**529.3**	494.9	424.0
Marine	**136.0**	122.5	118.6
Surety and Other	**112.2**	106.0	98.3
Total Specialty	**1,598.1**	1,522.0	1,322.6
Personal automobile	**1,633.2**	1,590.7	1,670.3
Homeowners and Other	**364.9**	277.7	237.5
Total Personal Lines	**1,998.1**	1,868.4	1,907.8
Total Other	**65.5**	66.2	66.6
Total loss and LAE reserves	**$ 7,012.6**	$ 6,447.6	$ 6,024.0

Loss and LAE reserves in our "Other core commercial" lines include monoline general liability, commercial umbrella, and monoline property. "Specialty Property & Casualty" includes program business, specialty industrial and commercial property, excess and surplus lines and specialty general liability coverage. "Professional and Executive Lines" includes professional and management liability, fidelity and crime, and other property and liability lines for healthcare firms. Loss and LAE reserves in our "Total Other" segment relate to our run-off voluntary assumed property and casualty reinsurance pools business and our run-off direct asbestos and environmental business.

Prior Year Development

Conditions and trends that have affected reserve development in the past will not necessarily recur in the future. As discussed under "Reserving Process Overview" in the preceding section, our historical loss experience and loss development patterns are important factors in estimating loss reserves, however, they are not the only factors we evaluate to establish reserves. Therefore, a mechanical application of standard actuarial methodologies in projecting ultimate claims could result in materially different reserves to those held. Accordingly, it is not appropriate to extrapolate future favorable or unfavorable development based on amounts experienced in prior periods.

The following table summarizes prior year (favorable) unfavorable development by segment for the periods indicated:

	2022			2021			2020		
(in millions)	Loss & LAE	Catastrophe	Total	Loss & LAE	Catastrophe	Total	Loss & LAE	Catastrophe	Total
Core Commercial	**$ (10.3)**	**(17.3)**	**$ (27.6)**	$ (17.8)	$ (9.7)	$ (27.5)	$ (12.6)	$ (14.7)	$ (27.3)
Specialty	**(19.5)**	**(8.7)**	**(28.2)**	(16.2)	(2.3)	(18.5)	(6.4)	(4.1)	(10.5)
Personal Lines	**8.0**	**14.0**	**22.0**	(23.1)	(3.0)	(26.1)	(0.7)	1.7	1.0
Other	**1.2**	**—**	**1.2**	1.0	—	1.0	4.2	—	4.2
Total prior year favorable development	**$ (20.6)**	**$ (12.0)**	**$ (32.6)**	$ (56.1)	$ (15.0)	$ (71.1)	$ (15.5)	$ (17.1)	$ (32.6)

Catastrophe Loss Development

In 2022, favorable catastrophe development was $12.0 million, primarily due to lower than expected losses related to 2021 hurricane Ida. In 2021, favorable catastrophe development was $15.0 million, primarily due to lower than expected losses related to certain 2018 through 2020 hurricanes, tornadoes, and other storms. In 2020, favorable catastrophe development was $17.1 million, primarily due to lower than expected losses related to certain 2017, 2018, and 2019 wind storms, winter storms and hurricanes, and the 2017 and 2018 California wildfires.

2022 Loss and LAE Development, excluding catastrophes

In 2022, net favorable loss and LAE development, excluding catastrophes, was $20.6 million. Core Commercial favorable development of $10.3 million was primarily due to lower than expected losses of $32.1 million within the workers' compensation line in accident years 2013 through 2018 and 2020. This was partially offset by higher than expected losses of $18.2 million in our commercial automobile line driven by higher bodily injury and personal injury protection loss adjustment expenses and loss severity in accident years 2016, 2018, 2019, and 2021 due in part to an increased rate of litigated claims. Specialty favorable development of $19.5 million was primarily due to lower than expected losses of $25.1 million within our Professional and Executive division, lower than expected

losses of $14.5 million in our surety line, and lower than expected losses in our Marine division, partially offset by higher than expected losses of $27.4 million in our Specialty P&C division. Within Specialty P&C, higher than expected losses of $32.9 million in program business were partially offset by lower than expected losses in our specialty industrial line. The higher losses in program business were primarily driven by general liability coverages, the majority of which relate to programs that are in run-off and those for which we have initiated non-renewal. Personal Lines unfavorable development of $8.0 million was primarily due to higher than expected losses in the homeowners line, primarily in accident year 2021. The increase in homeowners losses was primarily due to higher severity and longer cycle times in repair activity, primarily related to claims incurred in the fourth quarter of 2021.

2021 Loss and LAE Development, excluding catastrophes

In 2021, net favorable loss and LAE development, excluding catastrophes, was $56.1 million. Core Commercial favorable development of $17.8 million was primarily due to lower than expected losses of $22.3 million within the workers' compensation line in accident years 2014 through 2020. Specialty favorable development of $16.2 million was primarily due to lower than expected losses within our surety line, primarily in accident years 2013 through 2016, 2018 and 2019, and lower than expected losses in our Marine division in accident years 2019 and 2020, partially offset by higher than expected losses in our general liability lines. Personal Lines favorable development of $23.1 million was primarily due to lower than expected losses of $23.5 million in the personal automobile line, driven by lower bodily injury and personal injury protection losses, primarily in accident year 2020.

2020 Loss and LAE Development, excluding catastrophes

In 2020, net favorable loss and LAE development, excluding catastrophes, was $15.5 million. Core Commercial favorable development of $12.6 million was primarily due to lower than expected losses of $34.9 million within the workers' compensation line in accident years 2016 through 2019. This was partially offset by higher than expected losses in our commercial automobile line driven by higher bodily injury and personal protection losses, primarily in accident years 2017 through 2019, and in our commercial multiple peril line, primarily in accident years 2017 and 2019. Specialty favorable development of $6.4 million was primarily due to lower than expected losses in our Marine division, in accident years 2017 through 2019, partially offset by higher than expected losses in our general liability lines. In addition, the adverse prior year development in Other was due to our run-off voluntary assumed property and casualty reinsurance pools business primarily based on an updated third-party actuarial study received in the first quarter of 2020 for the legacy ECRA pool that consists primarily of asbestos and environmental exposures.

Asbestos and Environmental Reserves

As of December 31, 2022, we had $11.9 million of net asbestos and environmental reserves, comprised of $9.8 million of direct reserves and $2.1 million of assumed reinsurance pool reserves. This compares to net reserves of $11.7 million and $39.8 million as of December 31, 2021 and 2020, respectively. Ending loss and LAE reserves for all direct business written by our insurance companies related to asbestos and environmental damage liability were $9.8 million, $9.6 million and $8.3 million, net of reinsurance of $16.8 million, $16.7 million and $17.9 million for the years ended December 31, 2022, 2021 and 2020, respectively. Activity for our direct asbestos and environmental reserves was not significant to our 2022, 2021 or 2020 financial results. As a result of our historical direct underwriting mix of Core Commercial and Specialty policies toward smaller and middle market risks, past asbestos and environmental damage liability loss experience has remained minimal in relation to our total loss and LAE incurred experience. Although we attempt to limit our exposures to asbestos and environmental damage liability through specific policy exclusions, we have been, and may continue to be, subject to claims related to these exposures.

In addition to reserves we carry to cover exposure in our direct business, we have established gross and net loss and LAE reserves for assumed reinsurance pool business with asbestos and environmental damage liability. As of December 31, 2022, we had $30.5 million of gross reserves and $2.1 million of net reserves for assumed reinsurance pool business. This compares to $31.0 million of gross loss and LAE reserves and $2.1 million of net loss and LAE reserves at December 31, 2021, and gross and net loss and LAE reserves of $31.5 million at December 31, 2020. These reserves relate to pools in which we have terminated our participation; however, we continue to be subject to claims related to years in which we were a participant. Results of operations from these pools are included in our Other segment. A significant part of our gross pool reserves relates to our participation in the ECRA voluntary pool. In 1982, the pool was dissolved and since that time, the business has been in run-off. During 2021, we entered into an agreement to transfer our ECRA pool participations to a third-party reinsurer. This transfer was executed through a 100% reinsurance arrangement for our ECRA claim liability participations written during the period 1950 to 1982. This transaction had no significant impact on our 2021 results of operations.

We estimate our ultimate liability for asbestos, environmental and toxic tort liability claims, whether resulting from direct business, assumed reinsurance or pool business, based upon currently known facts, reasonable assumptions where the facts are not known, current law, and methodologies currently available. Although these outstanding claims are not believed to be significant, their existence gives rise to uncertainty and are discussed because of the possibility that they may become significant. We believe that, notwithstanding the evolution of case law expanding liability in asbestos and environmental claims, recorded reserves related to these claims are adequate. Nevertheless, the asbestos, environmental and toxic tort liability reserves could be revised, and any such revisions could have a material adverse effect on our results of operations for a particular quarterly or annual period, or on our financial position.

Reinsurance Recoverables

Reinsurance recoverables were $1,964.5 million and $1,907.3 million at December 31, 2022 and December 31, 2021, respectively, of which $111.1 million and $100.4 million, respectively, represent billed recoverables. A reinsurance recoverable is billed after an eligible reinsured claim is paid by an insurer. Billed reinsurance recoverables related to the Michigan Catastrophic Claims Association (the "MCCA") were $50.7 million and $49.8 million at December 31, 2022 and December 31, 2021, respectively, and billed non-MCCA reinsurance recoverables totaled $60.4 million and $50.6 million at December 31, 2022 and December 31, 2021, respectively. At December 31, 2022 and December 31, 2021, there were no billed non-MCCA recoverables outstanding greater than 90 days.

INVESTMENTS

INVESTMENT RESULTS

Net investment income before income taxes was as follows:

DECEMBER 31	2022	2021	2020
(dollars in millions)			
Fixed maturities	**$ 239.3**	$ 216.9	$ 222.5
Limited partnerships	**35.7**	68.2	16.7
Mortgage loans	**16.1**	18.0	17.5
Equity securities	**12.0**	15.6	14.8
Other investments	**4.6**	3.0	3.2
Investment expenses	**(11.4)**	(11.0)	(9.6)
Net investment income	**$ 296.3**	$ 310.7	$ 265.1
Earned yield, fixed maturities	**3.04%**	2.99%	3.33%
Earned yield, total portfolio	**3.29%**	3.70%	3.35%

The decrease in net investment income in 2022 was primarily due to lower limited partnership income, partially offset by the continued investment of operational cash flows and the impact of higher new money yields. The increase in net investment income in 2021 was primarily due to higher limited partnership income and, to a lesser extent, the continued investment of operational cash flows, partially offset by the impact of lower money yields. Income from partnerships can vary significantly from year to year based on the performance in the underlying portfolios. Lower income from our limited partnerships in 2022 reflects a more normalized return environment as compared to 2021, where performance was driven by substantial valuation increases across all private capital strategies, and which results are not indicative of the long-term targeted returns for this asset class. Partnership results in 2020, particularly early in the year, were negatively impacted by Pandemic-related business and financial market disruptions.

INVESTMENT PORTFOLIO

We held cash and investment assets diversified across several asset classes, as follows:

DECEMBER 31	2022		2021	
(dollars in millions)	Carrying Value	% of Total Carrying Value	Carrying Value	% of Total Carrying Value
Fixed maturities, at fair value	**$ 7,481.8**	**84.9%**	$ 7,723.9	82.3%
Limited partnerships and other investments	**397.5**	**4.5**	333.4	3.6
Mortgage and other loans	**388.6**	**4.4**	434.0	4.6
Equity securities, at fair value	**241.9**	**2.7**	661.3	7.0
Cash and cash equivalents	**305.0**	**3.5**	230.9	2.5
Total cash and investments	**$ 8,814.8**	**100.0%**	$ 9,383.5	100.0%

CASH AND INVESTMENTS

Total cash and investments decreased $568.7 million, or 6.1%, for the year ended December 31, 2022, primarily due to net market value depreciation and the funding of financing activities, including our dividend payments and stock repurchases, partially offset by the continued investment of operational cashflows.

The following table provides information about the investment types of our fixed maturities portfolio:

DECEMBER 31 *(in millions)*	2022			
Investment Type	Amortized Cost, net of Allowance for Credit Losses	Fair Value	Net Unrealized Loss	Change in Net Unrealized for the Year
U.S. Treasury and government agencies	$ 478.9	$ 420.2	$ (58.7)	$ (60.6)
Foreign government	2.3	2.2	(0.1)	(0.5)
Municipals:				
Taxable	1,218.4	1,055.7	(162.7)	(186.5)
Tax-exempt	21.1	20.4	(0.7)	(1.5)
Corporate	4,064.3	3,729.9	(334.4)	(493.3)
Asset-backed:				
Residential mortgage-backed	1,215.3	1,073.8	(141.5)	(142.9)
Commercial mortgage-backed	924.1	836.4	(87.7)	(109.7)
Asset-backed	370.1	343.2	(26.9)	(26.8)
Total fixed maturities	$ 8,294.5	$ 7,481.8	$ (812.7)	$ (1,021.8)

The change in net unrealized loss on fixed maturities was primarily due to higher prevailing interest rates and, to a lesser extent, wider credit spreads.

Amortized cost and fair value by rating category were as follows:

DECEMBER 31		2022			2021		
(dollars in millions) NAIC Designation	Rating Agency Equivalent Designation	Amortized Cost, net of Allowance for Credit Losses	Fair Value	% of Total Fair Value	Amortized Cost, net of Allowance for Credit Losses	Fair Value	% of Total Fair Value
1	Aaa/Aa/A	$ 5,761.4	$ 5,192.4	69.4%	$ 4,867.5	$ 4,987.6	64.6%
2	Baa	2,177.1	1,949.4	26.1	2,302.2	2,380.4	30.8
3	Ba	160.3	153.4	2.0	216.9	225.2	2.9
4	B	178.9	171.3	2.3	123.2	125.3	1.6
5	Caa and lower	15.0	14.2	0.2	5.0	5.4	0.1
6	In or near default	1.8	1.1	—	—	—	—
Total fixed maturities		$ 8,294.5	$ 7,481.8	100.0%	$ 7,514.8	$ 7,723.9	100.0%

Based on ratings by the National Association of Insurance Commissioners ("NAIC"), approximately 96% and 95% of our fixed maturity portfolio consisted of investment-grade securities at December 31, 2022 and 2021, respectively. The quality of our fixed maturity portfolio remains strong based on ratings, capital structure position, support through guarantees, underlying security, issuer diversification and yield curve position.

Our investment portfolio primarily consists of fixed maturity securities whose fair value is susceptible to market risk, including interest rate changes. See also "Quantitative and Qualitative Disclosures about Market Risk." Duration is a measurement used to quantify our inherent interest rate risk and analyze invested assets relative to our reserve liabilities.

The duration of our fixed maturity portfolio was as follows:

DECEMBER 31	2022			2021		
(dollars in millions) Duration	Amortized Cost, net of Allowance for Credit Losses	Fair Value	% of Total Fair Value	Amortized Cost, net of Allowance for Credit Losses	Fair Value	% of Total Fair Value
0-2 years	$ 1,614.2	$ 1,580.3	21.1%	$ 1,080.2	$ 1,108.3	14.3%
2-4 years	2,170.6	2,056.8	27.5	1,581.1	1,660.9	21.5
4-6 years	2,044.2	1,850.6	24.8	2,263.8	2,349.0	30.4
6-8 years	2,004.3	1,638.7	21.9	1,603.8	1,622.4	21.0
8-10 years	339.5	263.6	3.5	854.9	846.5	11.0
10+ years	121.7	91.8	1.2	131.0	136.8	1.8
Total fixed maturities	$ 8,294.5	$ 7,481.8	100.0%	$ 7,514.8	$ 7,723.9	100.0%
Weighted average duration		4.3			4.9	

Our fixed maturity and equity securities are carried at fair value. Financial instruments whose value was determined using significant management judgment or estimation constituted less than 1% of the total assets we measured at fair value. See also Note 4 - "Fair Value" in the Notes to Consolidated Financial Statements.

Limited partnerships and other investments consist primarily of our interest in corporate middle market and real estate limited partnerships. Corporate middle market limited partnerships may invest in senior or subordinated debt, preferred or common equity or a combination thereof, of privately-held middle market businesses. Real estate limited partnerships hold equity ownership positions in real properties and invest in debt secured by real properties. Our limited partnerships are generally accounted for under the equity method, or as a practical expedient using the fund's net asset value, with financial information provided by the partnership on a two or three month lag.

Mortgage and other loans consist of commercial mortgage loan participations, which represent our interest in commercial mortgage loans originated by a third-party. We share, on a pro-rata basis, in all related cash flows of the underlying mortgage loans, which are primarily investment-grade quality and diversified by geographic area and property type.

Equity securities primarily consist of U.S. income-oriented large capitalization common stocks and a broadly diversified U.S. equity index exchange-traded fund.

Although we expect to invest new funds primarily in investment-grade fixed maturities, we have invested, and expect to continue to invest, a portion of funds in below investment grade fixed maturities, limited partnerships, common equity securities and other investment assets.

We deposit funds with various state and governmental authorities. See Note 2 – "Investments" in the Notes to Consolidated Financial Statements for additional information.

IMPAIRMENTS

For the years ended December 31, 2022, 2021 and 2020, we recognized net impairments of $16.7 million, $0.7 million and $26.3 million, respectively. In 2022, impairments consisted primarily of losses on intent to sell fixed maturity securities due to a transfer of certain investment management responsibilities to an external manager. In 2021, impairments primarily consisted of $1.3 million on fixed maturities, partially offset by recoveries of credit losses on mortgage loans. In 2020, impairments primarily consisted of $17.6 million on fixed maturities, primarily relating to intent to sell securities, and $6.7 million of estimated credit losses on mortgage loans.

At December 31, 2022 and 2021, the allowance for credit losses on mortgage loans was $3.2 million and $7.1 million, respectively, and the allowance for credit losses on available-for-sale securities was $2.1 million and $0.3 million, respectively.

There were no fixed maturity securities on non-accrual status at December 31, 2022 or 2021, and there was no effect on income for the year ended December 31, 2022. The effects of non-accruals compared with amounts that would have been recognized in accordance with the original terms of the fixed maturities for the years ended December 31, 2021 and 2020 were not material. Any defaults in the fixed maturities portfolio in future periods may negatively affect investment income.

UNREALIZED LOSSES

Gross unrealized losses on fixed maturities at December 31, 2022 were $817.7 million, an increase of $769.7 million compared to December 31, 2021, primarily attributable to higher prevailing interest rates and, to a lesser extent, wider credit spreads. At December 31, 2022, gross unrealized losses consisted primarily of $337.7 million on corporate fixed maturities, $164.2 million on municipals, $142.1 million on residential mortgage-backed securities, $87.7 million on commercial mortgage-backed securities and $58.9 million on U.S. government securities. See also Note 2 – "Investments" in the Notes to Consolidated Financial Statements.

We view gross unrealized losses on fixed maturities as non-credit related since it is our assessment that these securities will recover, allowing us to realize their anticipated long-term economic value. Further, we do not intend to sell, nor is it more likely than not we will be required to sell, such debt securities before this expected recovery of amortized cost (see also "Liquidity and Capital Resources"). Inherent in our assessment are the risks that market factors may differ from our expectations; we may decide to subsequently sell a security for unforeseen business needs or an economic purpose; or changes in the credit assessment from our original assessment may lead us to determine that a sale at the current value would maximize recovery on such investments. To the extent that there are such adverse changes, an impairment would be recognized as a realized loss. Although unrealized losses on fixed maturities are not reflected in the results of financial operations until they are realized, the fair value of the underlying investment, which does reflect the unrealized loss, is reflected in our Consolidated Balance Sheets.

The following table sets forth gross unrealized losses for fixed maturities by maturity period at December 31, 2022 and 2021. Actual maturities may differ from contractual maturities because borrowers may have the right to call or prepay obligations, with or without call or prepayment penalties, or we may have the right to put or sell the obligations back to the issuers.

DECEMBER 31	2022	2021
(in millions)		
Due in one year or less	**$ 2.4**	$ —
Due after one year through five years	**108.9**	0.7
Due after five years through ten years	**382.0**	19.4
Due after ten years	**67.6**	10.9
	560.9	31.0
Mortgage-backed and asset-backed securities	**256.8**	17.0
Total fixed maturities	**$ 817.7**	$ 48.0

Our investment portfolio and shareholders' equity can be significantly impacted by changes in market values of our securities. Market volatility could increase and defaults on fixed income securities could occur. As a result, we could incur additional realized and unrealized losses in future periods, which could have a material adverse impact on our results of operations and/or financial position.

The Federal Reserve ("the Fed") increased the federal funds rate by 4.50% since the beginning of 2022 and has indicated that ongoing increases to the target range may be appropriate in 2023 in order to return inflation to 2 percent over time. The Fed has stated it will also continue to reduce the size of its balance sheet. Despite these efforts to tame pricing pressures in the U.S., inflation remains at high levels. The Fed's limited set of quantitative tightening tools may be insufficient to address certain drivers of price pressures, including supply and demand imbalances and energy price volatility derived from geopolitical risk. Tighter financial conditions for businesses and consumers are increasing the probability of a further economic slowdown in 2023.

We may experience defaults on fixed income securities, particularly with respect to non-investment grade debt securities. Although we perform rigorous credit analysis of our fixed income investments, it is difficult to foresee which issuers, industries or markets will be most affected. As a result, the value of our fixed maturity portfolio could change rapidly in ways we cannot currently anticipate, and we could incur additional realized and unrealized losses in future periods.

QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

INTEREST RATE SENSITIVITY

The valuation of the investment portfolio is subject to risk resulting from interest rate fluctuations, which may adversely impact the valuation of the investment portfolio. In a rising interest rate environment, the value of the fixed maturity sector, which comprises approximately 85% of our investment portfolio, may decline as a result of decreases in the fair value of the securities. Our intent is to hold securities to maturity and recover the decline in valuation as prices accrete to par. However, our intent may change prior to maturity due to changes in the financial markets, our analysis of an issuer's credit metrics and prospects, or as a result of changes in cash flow needs.

Interest rate fluctuations may also reduce net investment income and, as a result, profitability. In an increasing rate environment, the duration of our fixed maturity portfolio could lengthen as issuers choose not to exercise their option to call or prepay their debt. For this and other reasons, funds may not be available to invest at higher interest rates. Also, in a declining interest rate environment, prepayments and calls may increase as issuers exercise their option to refinance at lower rates. The resulting funds would be reinvested at lower yields.

The following table illustrates the estimated impact on the fair value of our fixed maturity portfolio at December 31, 2022 and 2021 of hypothetical changes in prevailing interest rates, defined as changes in interest rates on U.S. Treasury debt. It does not reflect changes in credit spreads, liquidity spreads and other factors that also affect the value of securities. Since changes in prevailing interest rates are often accompanied by changes in these other factors, the reader should not assume that an actual change in interest rates would result in the values illustrated.

(dollars in millions) INVESTMENT TYPE	+300bp	+200bp	+100bp	0	-100bp	-200bp	-300bp
Residential mortgage-backed securities	**$ 905**	**$ 960**	**$ 1,015**	**$ 1,074**	**$ 1,135**	**$ 1,185**	**$ 1,230**
Municipal securities	**920**	**970**	**1,020**	**1,076**	**1,135**	**1,200**	**1,260**
All other fixed maturity securities	**4,770**	**4,945**	**5,135**	**5,332**	**5,540**	**5,760**	**5,990**
Total December 31, 2022	**$ 6,595**	**$ 6,875**	**$ 7,170**	**$ 7,482**	**$ 7,810**	**$ 8,145**	**$ 8,480**
Total December 31, 2021	$ 6,645	$ 6,985	$ 7,345	$ 7,724	$ 8,100	$ 8,470	$ 8,865

Our investment strategy seeks to balance the goals of liquidity, capital preservation, net investment income stability and total return. The allocation process takes into consideration the profile and expected payout pattern of our liabilities, the level of capital required to support growth across lines of business and the risk profiles of a wide range of asset classes.

The majority of our assets are invested in investment grade fixed income securities across various sectors including U.S. government, municipal, corporate, residential and commercial mortgage-backed securities and asset-backed securities. Our holdings are diversified within and across major investment and industry sectors to mitigate concentration risk. We monitor the credit quality of our investments and our exposure to individual markets, borrowers, industries, sectors and, in the case of commercial mortgage-backed securities and commercial mortgage loan participations, property types and geographic locations. In addition, we currently carry debt that is subject to interest rate risk, which was issued at fixed interest rates between 2.50% and 8.207%.

EQUITY PRICE RISK

Our equity securities portfolio is exposed to equity price risk arising from potential volatility in equity market prices. Portfolio characteristics are analyzed regularly and price risk is actively managed through a variety of techniques. A hypothetical increase or decrease of 10% in the market price of our equity securities would have resulted in an increase or decrease in the fair value of the equity securities portfolio of approximately $24 million at December 31, 2022 and approximately $66 million at December 31, 2021, which amounts, after taxes, would be reported in net income.

OTHER ITEMS

Net income also included the following items:

(in millions)	YEARS ENDED DECEMBER 31					
2022	**Core Commercial**	**Specialty**	**Personal Lines**	**Other**	**Discontinued Operations**	**Total**
Net realized and unrealized investment gains (losses)	**$ (50.7)**	**$ (23.1)**	**$ (33.2)**	**$ 0.5**	**$ —**	**$ (106.5)**
Other non-operating items	**—**	**—**	**—**	**(0.5)**	**—**	**(0.5)**
Discontinued life businesses, net of taxes	**—**	**—**	**—**	**—**	**(0.8)**	**(0.8)**
2021						
Net realized and unrealized investment gains (losses)	$ 62.5	$ 26.9	$ 37.8	$ (4.2)	$ —	$ 123.0
Discontinued operations - Chaucer business, net of taxes	—	—	—	—	1.2	1.2
Discontinued life businesses, net of taxes	—	—	—	—	(2.5)	(2.5)
2020						
Net realized and unrealized investment gains (losses)	$ 3.7	$ 1.5	$ 3.5	$ (3.7)	$ —	$ 5.0
Loss from repayment of debt	—	—	—	(6.2)	—	(6.2)
Other non-operating items	(0.6)	(0.3)	(0.7)	—	—	(1.6)
Discontinued operations - Chaucer business, net of taxes	—	—	—	—	0.4	0.4
Discontinued life businesses, net of taxes	—	—	—	—	(3.7)	(3.7)

We manage investment assets for our Core Commercial, Specialty, Personal Lines and Other segments based on the requirements of our combined property and casualty companies. We allocate the investment income, expenses and realized gains and losses to our Core Commercial, Specialty, Personal Lines and Other segments based on actuarial information related to the underlying businesses.

Net realized and unrealized investment losses were $106.5 million in 2022 compared to net realized and unrealized investment gains of $123.0 million and $5.0 million in 2021 and 2020, respectively. Net realized and unrealized investment losses in 2022 were primarily due to $63.3 million of net depreciation in the fair value of equity securities, from $26.7 million of net realized investment losses from sales of fixed maturities and, to a lesser extent, from impairment losses primarily on intent to sell fixed maturity securities. Net realized and unrealized investment gains in 2021 were primarily due to $119.1 million of appreciation in the fair value of our equity securities. Net realized and unrealized investment gains in 2020 were primarily due to net realized investment gains from sales and other of $17.9 million and, to a lesser extent, appreciation in the fair value of equity securities of $13.4 million, partially offset by impairment losses on investments.

In 2020, we repurchased all of our outstanding 6.35% subordinated debentures due March 30, 2053 with a net carrying value of $168.9 million, at a cost of $175.0 million, resulting in a pre-tax loss of $6.1 million. Additionally, in 2020 we repurchased a portion of our 7.625% senior debentures with a net carrying value of $0.8 million.

Our discontinued life businesses generated $0.8 million, $2.5 million and $3.7 million of after-tax losses during 2022, 2021 and 2020, respectively. These losses were from our former accident and health business, and primarily related to the long-term care pool. Our discontinued Chaucer business produced $1.2 million and $0.4 million of after-tax income during 2021 and 2020, respectively. Income from this business in 2021 resulted from the release of certain tax positions, due to the expirations of certain statutes of limitations.

INCOME TAXES

We file a consolidated U.S. federal income tax return that includes our holding company and its domestic subsidiaries (including non-insurance operations).

The provision for income taxes from continuing operations was an expense of $27.2 million, $101.3 million, and $82.8 million in 2022, 2021 and 2020, respectively. These amounts resulted in consolidated effective tax rates of 18.9%, 19.4% and 18.6% on pre-tax income for 2022, 2021 and 2020, respectively. The provisions in 2022, 2021 and 2020 reflect benefits related to tax planning strategies implemented in prior years of $1.4 million, $4.6 million and $9.2 million, respectively. The provisions in 2022, 2021 and 2020 also included excess tax benefits related to stock-based compensation of $3.2 million, $2.6 million and $2.1 million, respectively. In addition, the provision for 2021 includes a net benefit related to prior years' federal research tax credits of $1.7 million. Absent these items, the provision for income taxes for 2022, 2021 and 2020 would have been expenses of $31.8 million, $110.2 million and $94.1 million, respectively, or 22.1% for 2022, 21.1% for 2021 and 21.2% for 2020. The higher effective tax rate in 2022 is primarily due to lower income from continuing operations in the current year.

The income tax provision on operating income was an expense of $51.1 million, $80.0 million and $92.6 million for 2022, 2021 and 2020, respectively. These provisions resulted in effective tax rates for operating income of 20.4%, 20.1% and 20.7% in 2022, 2021 and 2020, respectively. The provisions for 2022, 2021 and 2020 reflect the aforementioned excess tax benefits related to stock-based compensation. The provision for 2021 also reflects the aforementioned net benefit related to prior years' federal research tax credits. Absent these items, the provision for income taxes for 2022, 2021 and 2020 would have been expenses of $54.3 million, $84.3 million and $94.7 million, or 21.6% for 2022 and 21.2% for 2021 and 2020.

During 2021, we recorded increases in reserves related to uncertain tax positions of $2.0 million as an expense in continuing operations. We also recorded decreases in reserves related to uncertain tax positions, due to the expirations of certain statutes of limitations during 2021 and 2020. The 2021 reserve release of $1.1 million was recorded as a benefit to income from discontinued Chaucer business, net of taxes. The 2020 reserve release of $0.5 million was recorded as a benefit to the income (loss) from discontinued life businesses, net of taxes. We are subject to U.S. federal and state examinations and foreign examinations for years after 2018. The audit of our Massachusetts corporate excise tax years 2017 and 2018 was settled in October 2022. The audit of our 2019 Illinois business income tax commenced in May 2022.

In prior years, we completed several transactions which resulted in the realization, for tax purposes only, of unrealized gains in our investment portfolio. As a result of these transactions, we were able to realize capital losses carried forward and release the valuation allowance recorded against the deferred tax asset related to those losses. The releases of valuation allowances were recorded as a benefit in accumulated other comprehensive income. Previously unrealized benefits of $1.4 million, $4.6 million and $9.2 million, attributable to non-operating income, were recognized as part of our income from continuing operations during 2022, 2021 and 2020, respectively. The remaining amount of $5.6 million in accumulated other comprehensive income will be released into income from continuing operations in future years, as the investment securities subject to these transactions are sold or mature.

CRITICAL ACCOUNTING ESTIMATES

The discussion and analysis of our financial condition and results of operations are based upon our consolidated financial statements. These statements have been prepared in accordance with U.S. GAAP, which requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amount of revenues and expenses during the reporting period. Actual results could differ from those estimates. The following critical accounting estimates are those which we believe affect the more significant judgments and estimates used in the preparation of our financial statements. Additional information about other significant accounting policies and estimates may be found in Note 1 – "Summary of Significant Accounting Policies" in the Notes to Consolidated Financial Statements.

RESERVE FOR LOSSES AND LOSS EXPENSES

See "Reserve for Losses and Loss Adjustment Expenses" within "Results of Operations – Segments" for a discussion of our critical accounting estimates for loss reserves.

REINSURANCE RECOVERABLE BALANCES

See "Reinsurance Recoverables" in Part I – Item 1 for information on our reinsurance recoverable balances.

PENSION BENEFIT OBLIGATIONS

We currently have a qualified defined benefit plan and several smaller non–qualified benefit plans. In order to measure the liabilities and expense associated with these plans, we must make various estimates and key assumptions, including discount rates used to value liabilities, assumed rates of return on plan assets, employee turnover rates and anticipated mortality rates. These estimates and assumptions are reviewed at least annually and are based on our historical experience, as well as current facts and circumstances. In addition, we use outside actuaries to assist in measuring the expenses and liabilities associated with our defined benefit pension plan.

Two significant assumptions used in the determination of benefit plan obligations and expenses that are dependent on market factors, which have been subject to a greater level of volatility in recent years, are the discount rate and the return on plan asset assumptions. The discount rate enables us to state expected future benefit payments as a present value on the measurement date. We also use this discount rate in the determination of our pre-tax pension expense or benefit. A higher discount rate decreases the present value of benefit obligations and decreases pension expense. We determined our discount rate for the qualified benefit plan utilizing independent yield curves which provide for a portfolio of high quality bonds that are expected to match the cash flows of our pension plans. Bond information used in the yield curve included only those rated Aa or better as of December 31, 2022 and 2021, respectively, and had been rated by at least two well-known rating agencies. The discount rates used to value liabilities in our qualified pension plan were 6.00% and 3.25% as of December 31, 2022 and 2021, respectively.

To determine the expected long-term return on plan assets, we generally consider historical mean returns by asset class for passive indexed strategies, as well as current and expected asset allocations, and adjust for certain factors that we believe will have an impact on future returns. Actual returns on plan assets in any given year seldom result in the achievement of the expected rate of return on assets. Actual returns on plan assets in excess of these expected returns will generally reduce our net actuarial losses (or increase actuarial gains) that are reflected in the accumulated other comprehensive income balance in shareholders' equity, whereas actual returns on plan assets that are less than expected returns will generally increase our net actuarial losses (or decrease actuarial gains) that are reflected in accumulated other comprehensive income. These gains or losses are amortized into expense in future years. The qualified benefit plan held assets consisting of approximately 90% fixed maturities and 10% equity securities at December 31, 2022.

The expected return on asset assumption was 3.75% in both 2022 and 2021. Asset returns are reflected net of administrative expenses.

Net actuarial losses related to the qualified benefit plan of $12.5 million were reflected as changes to accumulated other comprehensive income in both 2022 and 2021. Net actuarial losses in 2022 and 2021 resulted from lower than expected investment returns during the year, partially offset by an increase in the discount rate. In 2022 and 2021, amortization of actuarial losses from prior years was $4.4 million and $2.1 million, respectively.

Expenses related to our qualified benefit plan are generally calculated based upon information available at the beginning of the plan year. Our pre-tax expense related to our qualified benefit plan was $1.5 million for 2022 compared to a pre-tax benefit of $2.3 million for 2021. As a result of lower than expected market returns in 2022, partially offset by an increase in the discount rate, our pension benefit related to our qualified benefit plan is expected to be an expense of $6.2 million in 2023.

Holding all other assumptions constant, sensitivity to changes in our key assumptions related to our qualified benefit plan is as follows:

(in millions)		
Discount Rate -		
25 basis point increase		
Change in Benefit Obligation	$	(5.8)
Change in 2023 Expense		(0.7)
25 basis point decrease		
Change in Benefit Obligation		6.0
Change in 2023 Expense		0.7
Expected Return on Plan Assets -		
25 basis point increase		
Change in 2023 Expense		(0.9)
25 basis point decrease		
Change in 2023 Expense		0.9

INVESTMENT CREDIT LOSSES

We employ a systematic methodology to evaluate declines in fair values below amortized cost for all fixed maturity investments. The methodology utilizes a quantitative and qualitative process that seeks to ensure that available evidence concerning the declines in fair value below amortized cost is evaluated in a disciplined manner. In determining whether a decline in fair value below amortized cost should be recorded as an impairment, we evaluate several factors and circumstances, including the issuer's overall financial condition; the issuer's credit and financial strength ratings; the issuer's financial performance, including earnings trends, dividend payments and asset quality; any specific events which may influence the operations of the issuer; the general outlook for market conditions in the industry or geographic region in which the issuer operates; and the degree to which the fair value of an issuer's securities is below our cost. We consider factors that might raise doubt about the issuer's ability to make contractual payments as they become due and whether we expect to recover the entire amortized cost basis of the security.

We monitor corporate fixed maturity securities with unrealized losses on a quarterly basis and more frequently when necessary to identify potential credit deterioration, as evidenced by ratings downgrades, unexpected price variances, and/or company or industry specific concerns. We apply consistent standards of credit analysis which includes determining whether the issuer is current on its contractual payments, and we consider past events, current conditions and reasonable and supportable forecasts to evaluate whether we

expect to recover the entire amortized cost basis of the security. We utilize valuation declines as a potential indicator of credit deterioration and apply additional levels of scrutiny in our analysis as the severity of the decline increases.

For our impairment review of asset-backed fixed maturity securities, we forecast our best estimate of the prospective future cash flows of the security to determine if we expect to recover the entire amortized cost basis of the security. Our analysis includes estimates of underlying collateral default rates based on historical and projected delinquency rates and estimates of the amount and timing of potential recovery. We consider available information relevant to the collectability of cash flows, including information about the payment terms of the security, prepayment speeds, the financial condition of the underlying borrowers, collateral trustee reports, credit ratings analysis and other market data when developing our estimate of the expected cash flows.

When an impairment of a fixed maturity security occurs, and we intend to sell or more likely than not will be required to sell the investment before recovery of its amortized cost basis, the amortized cost of the security is reduced to its fair value, with a corresponding charge to earnings, which reduces net income and earnings per share. If we do not intend to sell the fixed maturity investment or more likely than not will not be required to sell it, we separate the impairment into the amount we estimate represents the credit loss and the amount related to all other factors. The amount of the estimated loss attributable to credit is recognized in earnings, which reduces net income and earnings per share.

We estimate the amount of the credit impairment by comparing the amortized cost of the fixed maturity security with the net present value of the fixed maturity security's projected future cash flows, discounted at the effective interest rate implicit in the investment prior to impairment.

Declines in market value which are not credit loss related are recorded as unrealized losses, which do not affect net income and earnings per share, but reduce accumulated other comprehensive income, which is reflected in our Consolidated Balance Sheets. We cannot provide assurance that the impairments will be adequate to cover future losses or that we will not have substantial additional impairments in the future. See Note 2 – "Investments" and Note 3 – "Investment Income and Gains and Losses" in the Notes to Consolidated Financial Statements for further discussion regarding securities in an unrealized loss position and impairments.

STATUTORY SURPLUS OF INSURANCE SUBSIDIARIES

The following table reflects statutory surplus for our insurance subsidiaries:

DECEMBER 31 *(in millions)*	2022	2021
Total Statutory Capital and Surplus	**$ 2,690.4**	$ 2,720.0

The statutory capital and surplus for our insurance subsidiaries decreased $29.6 million during 2022. This decrease was primarily driven by unrealized investment losses, primarily due to changes in the fair value of equity securities, and the payment of a $100.0 million dividend to its parent company, partially offset by an increase in underwriting profits and, to a lesser extent, an increase in admitted deferred tax assets.

The NAIC prescribes an annual calculation regarding risk based capital ("RBC"). RBC ratios for regulatory purposes, as described in the glossary, are expressed as a percentage of the capital required to be above the Authorized Control Level (the "Regulatory Scale"); however, in the insurance industry, RBC ratios are widely expressed as a percentage of the Company Action Level. The following table reflects the Company Action Level, the Authorized Control Level and RBC ratios for Hanover Insurance (which includes Citizens and other insurance subsidiaries), as of December 31, 2022 and 2021, expressed both on the Industry Scale (Total Adjusted Capital divided by the Company Action Level) and Regulatory Scale (Total Adjusted Capital divided by Authorized Control Level):

(dollars in millions)

DECEMBER 31, 2022	*Company Action Level*	*Authorized Control Level*	*RBC Ratio Industry Scale*	*RBC Ratio Regulatory Scale*
The Hanover Insurance Company	**$ 1,291.7**	**$ 645.9**	**207%**	**415%**
DECEMBER 31, 2021				
The Hanover Insurance Company	$ 1,187.7	$ 593.9	228%	456%

LIQUIDITY AND CAPITAL RESOURCES

Liquidity is a measure of our ability to generate sufficient cash flows to meet the cash requirements of business operations. As a holding company, our primary ongoing source of cash is dividends from our insurance subsidiaries. However, dividend payments to us by our insurance subsidiaries are subject to limitations imposed by regulators, such as prior notice periods and the requirement that dividends in excess of a specified percentage of statutory surplus or prior year's statutory earnings receive prior approval (so called "extraordinary dividends"). Hanover Insurance paid $100.0 million, $255.0 million and $245.0 million in dividends, which were provided to the holding company in 2022, 2021 and 2020, respectively.

Sources of cash for our insurance subsidiaries primarily consist of premiums collected, investment income and maturing investments. Primary cash outflows are payments for losses and loss adjustment expenses, policy and contract acquisition expenses, other underwriting expenses and investment purchases. Cash outflows related to losses and loss adjustment expenses can be variable because of uncertainties surrounding settlement dates for liabilities for unpaid losses and because of the potential for large losses, either individually or in the aggregate. We periodically adjust our investment policy to respond to changes in short-term and long-term cash requirements.

Net cash provided by operating activities was $722.3 million during 2022, as compared to $823.7 million during 2021 and $707.6 million in 2020. The $101.4 million decrease in cash provided in 2022 as compared to 2021 was primarily due to an increase in loss and LAE payments and, to a lesser extent, higher operating expenses and federal income tax payments made in 2022, partially offset by an increase in premiums received. The $116.1 million increase in cash provided in 2021 as compared to 2020 was primarily due to increased premiums and, to a lesser extent, a decrease in federal income tax payments, partially offset by higher loss and LAE payments.

Net cash used in investing activities was $507.6 million during 2022, as compared to $460.2 million during 2021 and $608.8 million in 2020. During 2022, 2021 and 2020, cash used in investing activities primarily related to net purchases of fixed maturities and, to a lesser extent, equity securities and other investments.

Net cash used in financing activities was $140.6 million during 2022, as compared to $253.2 million during 2021 and $193.9 million in 2020. During 2022, cash used in financing activities primarily resulted from the payment of quarterly dividends to shareholders, and, to a lesser extent, from repurchases of common stock through the open market. During 2021, cash used in financing activities primarily resulted from repurchases of common stock through the open market and the payment of quarterly dividends to shareholders. During 2020, cash used in financing activities primarily resulted from repurchases of common stock through both an accelerated share repurchase agreement and the open market, the repayment of subordinated debentures and the payment of quarterly dividends to shareholders, partially offset by cash received from the issuance of senior debentures.

Dividends to common shareholders are subject to quarterly board approval and declaration. During 2022, we paid dividends that totaled $108.9 million. This included three quarterly dividends of $0.75 per share and one quarterly dividend of $0.81 per share. We believe that our holding company assets are sufficient to provide for future shareholder dividends should the Board of Directors declare them.

At December 31, 2022, THG, as a holding company, held approximately $333.5 million of fixed maturities and cash. We believe our holding company assets will be sufficient to meet our short-term obligations, which we expect to consist primarily of quarterly dividends to our shareholders (as and to the extent declared), interest on our senior and subordinated debentures, certain costs associated with benefits due to our former life employees and agents and, to the extent required, payments related to indemnification of liabilities associated with the sale of various subsidiaries. As discussed below, we have, and opportunistically may continue to, repurchase our common stock and debt. We do not expect that it will be necessary to dividend additional funds from our insurance subsidiaries in order to fund 2023 holding company obligations; however, we may decide to do so.

We expect to continue to generate sufficient positive operating cash to meet all short-term and long-term cash requirements relating to current operations, including the funding of our qualified defined benefit pension plan. We believe that this plan is fully funded. The ultimate payment amounts for our benefit plan is based on several assumptions, including but not limited to, the rate of return on plan assets, the discount rate for benefit obligations, mortality experience, interest crediting rates, inflation and the ultimate valuation and determination of benefit obligations. Since differences between actual plan experience and our assumptions are almost certain, changes, both positive and negative, to our current funding status and ultimately our obligations in future periods are likely.

Our insurance subsidiaries maintain a high degree of liquidity within their respective investment portfolios in fixed maturity and short-term investments. During 2022, the financial markets have experienced significant volatility and declines in value, including many securities currently held by THG and its subsidiaries. We believe that the quality of the assets we hold will allow us to realize the long-term economic value of our portfolio, including securities that are currently in an unrealized loss position. We do not anticipate the need to sell these securities to meet our insurance subsidiaries' cash requirements since we expect our insurance subsidiaries to generate sufficient operating cash to meet all short-term and long-term cash requirements relating to current operations. However, there can be no assurance that unforeseen business needs or other items will not occur causing us to have to sell those securities in a loss position before their values fully recover, thereby causing us to recognize impairment charges in that time period.

The Board of Directors authorized a stock repurchase program which provides for aggregate repurchases of our common stock of up to $1.3 billion. Under the repurchase authorization, we may repurchase, from time to time, common stock in amounts, at prices and at such times as we deem appropriate, subject to market conditions and other considerations. Repurchases may be executed using open market purchases, privately negotiated transactions, accelerated repurchase programs or other transactions. We are not required to purchase any specific number of shares or to make purchases by any certain date under this program. During 2022, we repurchased approximately 0.2 million shares, at an aggregate cost of $30.8 million. As of December 31, 2022, we had repurchased 7.9 million shares under this $1.3 billion program and had approximately $330 million available for additional repurchases.

We maintain our membership in the Federal Home Loan Bank ("FHLB") to provide access to additional liquidity based on our holdings of FHLB stock and pledged collateral. At December 31, 2022, we had borrowing capacity of $120.9 million. There were no borrowings outstanding under this short-term facility at December 31, 2022; however, we have borrowed and may continue to borrow, from time to time, through this facility to provide short-term liquidity.

On April 30, 2019, we entered into a credit agreement that provides for a five-year unsecured revolving credit facility not to exceed $200.0 million at any one time outstanding, with the option to increase the facility up to $300.0 million, (assuming no default and satisfaction of other specified conditions, including the receipt of additional lender commitments). The agreement also includes an uncommitted subfacility of $50.0 million for standby letters of credit. Borrowings, if any, under this new agreement are unsecured and incur interest at a rate per annum equal to, at our election, either (i) the greater of, (a) the prime commercial lending rate of the administrative agent, (b) the NYFRB Rate plus half a percent, or (c) the one month Adjusted LIBOR plus one percent and a margin that ranges from 0.25% to 0.625% depending on our debt rating, or (ii) Adjusted LIBOR for the applicable interest period, plus a margin that ranges from 1.25% to 1.625% depending on our debt rating. The agreement also contains certain financial covenants such as maintenance of specified levels of consolidated equity and leverage ratios, and requires that certain of our subsidiaries maintain minimum RBC ratios. We currently have no borrowings under this agreement and had no borrowings during 2022. The LIBOR rate, upon which Adjusted LIBOR is based, is in the process of being discontinued. During 2021, certain key tenors of LIBOR were extended with a new cessation date of June 20, 2023. Our credit agreement permits us to agree with the Administrative Agent for the credit facility on a replacement to Adjusted LIBOR subject to the satisfaction of certain conditions.

At December 31, 2022, we were in compliance with the covenants of our debt and credit agreements.

FINANCING OBLIGATIONS AND OTHER ESTIMATED OPERATING PAYMENTS

Financing obligations generally include repayment of our senior debentures, subordinated debentures and lease payments. Annual payments are related to the contractual principal and interest payments of these financing obligations as of December 31, 2022, unless otherwise noted, and lease payments reflect expected cash payments based upon active lease terms. It is expected that in the normal course of business, leases that expire will generally be renewed or replaced by leases on similar property and equipment. In addition, as discussed below, we expect payments related to our loss and LAE obligations, payments in support of the obligations of our benefit plans and for commitments to purchase investment securities at a future date. Actual payments may differ from the contractual and/or estimated payments.

Our debt obligations include senior debentures of $61.8 million due in 2025, which pay an annual interest rate of 7.625%, senior debentures of $375.0 million due in 2026, which pay annual interest at a rate of 4.50%, and senior debentures of $300.0 million due in 2030, which pay annual interest at a rate of 2.50%. Additionally, we carry subordinated debentures of $50.1 million due in 2027, which pay interest at an annual rate of 8.207%. Interest associated with this debt includes $33.2 million due in one year or less and $118.5 million due after one year.

Our subsidiaries are lessees with a number of leases, consisting primarily of equipment, real estate and fleet vehicles. Our lease obligations include $16.5 million due in one year or less and $35.7 million due after one year.

We currently have obligations to pay benefits under our qualified and non-qualified defined benefit pension and post-retirement benefit plans. We do not expect to make any significant contributions to our qualified plan in order to meet our minimum funding requirements for the next several years; however, additional contributions may be required in the future based on the level of pension assets and liabilities in future periods. Estimated payments to be made for non-qualified pension, postretirement, and postemployment benefits totaled $3.7 million due in one year or less and $25.6 million due after one year. These estimated payments extend until 2032; however, it is likely that payments will be required beyond 2032. Estimates of these payments and the payment patterns are based upon historical experience. The ultimate payment amount for our pension and postretirement benefit plans is based on several assumptions, including, but not limited to, the rate of return on plan assets, the discount rate for benefit obligations, mortality experience, interest crediting rates and then ultimate valuation of benefit obligations. Differences between actual plan experience and our assumptions are likely and will likely result in changes to our funding obligations in future periods.

Our investment commitments relate primarily to limited partnerships and were $56.1 million due in one year or less and $129.5 million due after one year.

Unlike many other forms of contractual obligations, loss and LAE reserves do not have definitive due dates and the ultimate payment dates are subject to a number of variables and uncertainties. The total gross loss and LAE reserve payments expected to be made in one year or less of $2,456.1 million and after one year of $4,556.5 million are estimates based principally on historical experience.

CONTINGENCIES AND REGULATORY MATTERS

REGULATORY AND INDUSTRY DEVELOPMENTS

In response to the Pandemic, regulators in many of the states in which we operate issued orders or guidance pertaining to, among other things, (a) premium refunds, credits or reductions for personal automobile insurance premiums and premiums for other insurance lines that regulators determined were disproportionately impacted by the Pandemic, including certain commercial lines, for the periods during which governmental restrictions were or remain in effect, with premium adjustments based on factors such as the ongoing frequency and severity of claims, inflation, repair costs and reinsurance pricing, among others; (b) premium payment grace periods, moratoriums on policy non-renewals and cancellations, and other measures that are similar to actions historically implemented in regions heavily impacted by catastrophes; and (c) a reassessment of rates in light of exposures, loss experience and economic conditions. Regulatory restrictions on rate increases, underwriting, policy terms, and the ability to non-renew business may, depending on their duration, limit THG's ability to manage our mix of business and any potential exposures that emerge in our lines of business in the near term.

Draft legislation was proposed in several state legislatures and in the United States Congress that sought to require insurers to retroactively pay unfunded Pandemic business interruption claims that insurance policies do not cover, to impose presumptions on insurance policy interpretation, and/or to mandate prospective pandemic coverage. The impact of such legislation, were it to be adopted, would, according to a statement of the NAIC on March 25, 2020, "create substantial solvency risks" for the property and casualty insurance sector, "significantly undermine the ability of insurers to pay other types of claims, and potentially exacerbate the negative financial and economic impacts the country is currently experiencing." Industry trade groups further assert that any such legislation would be violative of basic contract law and well-founded principles of constitutional law. Federal stimulus programs such as the CARES Act and the American Rescue Plan Act of 2021 provided financial support to individuals and businesses during the Pandemic and could mitigate the political pressure to continue advancing such proposed legislation.

Proposals were also considered at the federal level to establish government-funded pandemic insurance programs, possibly similar to the federal terrorism risk insurance program. Discussion on such competing proposals may continue, but it is premature to estimate their potential impact, if any, on our business.

Information regarding litigation and legal contingencies appears in Note 15 – "Commitments and Contingencies" in the Notes to Consolidated Financial Statements. Information related to certain regulatory and industry developments are contained in "Regulation" in Part I – Item 1 and in "Risk Factors" in Part I – Item 1A.

RISKS AND FORWARD-LOOKING STATEMENTS

Management's Discussion and Analysis contains "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995. For a discussion of indicators of forward-looking statements and specific important factors that could cause actual results to differ materially from those contained in forward-looking statements, see "Risk Factors" in Part I – Item 1A. This Management's Discussion and Analysis should be read and interpreted in light of such factors.

GLOSSARY OF SELECTED INSURANCE TERMS

Account business – Customers with multiple policies and/or coverages.

Account rounding – The conversion of single policy customers to accounts with multiple policies and/or additional coverages, to address customers' broader objectives.

Benefit payments – Payments made to an insured or their beneficiary in accordance with the terms of an insurance policy.

Big data – Large, diverse, complex sets of information that grow at ever-increasing rates and require special tools and methods to process. It encompasses the volume of information, the velocity, or speed at which it is created and collected, and the variety or scope of the data points being covered. Big data analytics refers to the use of predictive analytics, user behavior analytics, or certain other advanced data analytics methods that extract value from big data.

Casualty insurance – Insurance that is primarily concerned with the losses caused by injuries to third persons and their property (other than the policyholder) and the related legal liability of the insured for such losses.

Catastrophe – A severe loss, resulting from natural or manmade events, including, among others, hurricanes, tornadoes and other windstorms, earthquakes, hail, severe winter weather, fire, explosions, and terrorism.

Catastrophe loss – Loss and directly identified loss adjustment expenses from catastrophes, including development on prior years' catastrophe loss reserves. The Insurance Services Office ("ISO") Property Claim Services ("PCS") defines a catastrophe loss as an event that causes $25 million or more in insured property losses from U.S. direct writers and affects a significant number of property and

casualty policyholders and insurers. In limited instances where the impact of an event extends across multiple geographic areas or time periods, but is not within the specific parameters established by PCS, we may determine that certain losses are better included within the same catastrophe event. In addition to those catastrophe events declared by ISO, claims management also generally includes within the definition of a "catastrophe loss," a property loss event that causes approximately $5 million or more in company insured losses and affects in excess of one hundred policyholders. For the international business across our Core Commercial and Specialty businesses, management utilizes a "catastrophe loss" definition that is substantially consistent with the ISO definition framework.

Cede; cedent; ceding company – When a party reinsures its liability with another party, it "cedes" business and is referred to as the "cedent" or "ceding company."

Core Commercial – Commercial property and casualty coverages provided to small and mid-sized business in the United States, generally with annual premiums, per policy, up to $250,000, primarily through the commercial multiple peril, commercial automobile and workers' compensation lines of business.

Credit spread – The difference between the yield on the debt securities of a particular corporate debt issue and the yield of a similar maturity of U.S. Treasury debt securities.

Current accident year results – A non-GAAP measure of the estimated earnings impact of current premiums offset by estimated loss experience and expenses for the current accident year. This measure includes the estimated increase in revenue associated with higher prices (premiums), including those caused by price inflation and changes in exposure, partially offset by higher volume driven expenses and inflation of loss costs. Volume driven expenses include acquisition costs such as commissions paid to agents, which are typically based on a percentage of premium dollars.

Earned premium – The portion of a premium that is recognized as income, or earned, based on the expired portion of the policy period, that is, the period for which loss coverage has actually been provided. For example, after six months, $50 of a $100 annual premium is generally considered earned premium. The remaining $50 of annual premium is unearned premium. Net earned premium is earned premium net of reinsurance.

Excess of loss reinsurance – Reinsurance that indemnifies the insured against all or a specific portion of losses under reinsured policies in excess of a specified dollar amount or "retention."

Exposure – As it relates to underwriting, a measure of the rating units or premium basis of a risk; for example, an exposure of a number of automobiles. As it relates to loss events, the maximum value of claims made on an insurer from an event or events that would result in the total exhaustion of the cover or indemnity offered by an insurance policy.

Exposure management actions – Actions that focus on improving underwriting profitability and/or lessening earnings volatility by reducing our exposures and property concentrations in certain geographies and lines that are believed to be more prone to catastrophe and non-catastrophe losses. These actions include, but are not limited to, non-renewal, rate increases, stricter underwriting standards and higher deductible utilization, agency management actions, and more selective portfolio management by modifying our business mix.

Frequency – The number of claims occurring during a given coverage period.

Loss adjustment expenses ("LAE") – Expenses incurred in the adjusting, recording, and settlement of claims. These expenses include both internal company expenses and outside services. Allocated LAE ("ALAE") refers to defense and cost containment expenses, including legal fees, court costs, and investigation fees. Unallocated LAE ("ULAE") refers to expenses that generally cannot be associated with a specific claim. ULAE includes internal costs such as salaries, fringe benefits and other overhead costs associated with the claim settlement process and external adjustment and appraisal fees.

Loss costs – An amount of money paid for an insurance claim.

Loss reserves – Liabilities established by insurers to reflect the estimated cost of claims payments and the related expenses that the insurer will ultimately be required to pay in respect of insurance it has written. Reserves are established for losses and for LAE.

Lower (higher) expenses – Represents the period over period comparison of expenses relative to growth in earned premium. Volume driven expenses typically fluctuate commensurate with changes in premium. Accordingly, as we grow premium, these expenses increase from an absolute dollar perspective, but tend to stay proportionate compared to premium. Fixed expenses can remain constant or increase or decrease irrespective of the growth or decline in premium. When describing expenses as being "lower" or "higher" we are generally referring to changes in fixed costs relative to premium (fixed cost leverage). These "lower" or "higher" expenses correspond to a lower or higher expense ratio.

Marine insurance – In Specialty, this is a type of coverage developed for insuring businesses against physical losses to property such as contractor's equipment, builder's risk and goods in transit. It covers articles in transit by all forms of land and air transportation as well as bridges, tunnels, ocean and other means of transportation and communication. In the context of Personal Lines, this term relates to floater policies that cover expensive personal items such as fine art and jewelry.

Morbidity – Morbidity relates to the occurrence of illness, disability or other physical or psychological impairment, whether temporary or permanent, for insured risks. Morbidity is a key assumption for long-term care insurance and other forms of individual and group health benefits.

Partner agents; partner agencies; partner independent agents; agency partners; business partners – Independent agents (agencies) are self-employed, commission-based businesses who generally represent, and sell insurance policies provided by several insurance companies. We have appointed and developed mutually beneficial relationships with a limited number of independent agents who are demonstrated experts in their field, growth-oriented and align with our strategy. Although we may refer to those agencies as "partner agents," these are not legally binding "partnerships," but rather an opportunity for both the agent (agencies) and THG to work together and achieve common goals.

Peril – A cause of loss.

Property insurance – Insurance that provides coverage for tangible property in the event of loss, damage or loss of use.

Rate (Core Commercial and Specialty) – Represents the average change in premium on renewed policies caused by the base rate changes, discretionary pricing, and inflation, excluding the impact of changes in policy level exposure or insured risks.

Rate (Personal Lines) – Represents the estimated cumulative premium effect of approved rate actions applied to policies at renewal. Actual written rate changes may differ, as not all policies are retained. Personal Lines rate changes do not include inflation or changes in policy level exposure or insured risks.

Ratios: [(1)]

Catastrophe loss ratio –The ratio of catastrophe losses incurred to premiums earned.

Combined ratio – This ratio is the GAAP equivalent of the statutory ratio that is widely used as a benchmark for determining an insurer's underwriting performance. A ratio below 100% generally indicates profitable underwriting prior to the consideration of investment income (loss). A combined ratio over 100% generally indicates unprofitable underwriting prior to the consideration of investment income (loss). The combined ratio is the sum of the loss and loss adjustment expense ratio and the expense ratio.

Expense ratio – The ratio of underwriting expenses (including the amortization of deferred acquisition costs), less premium installment and other fee income and premium charge offs, to premiums earned for a given period.

Loss and loss adjustment expense ("LAE") ratio – The ratio of loss and loss adjustment expenses to premiums earned for a given period. The LAE ratio includes catastrophe losses and prior year reserve development.

Loss ratio – The ratio of losses (including catastrophe losses) to premiums earned for a given period.

Reinstatement premium – A pro-rata reinsurance premium that may be charged to us by our reinsurers. A reinstatement premium may be contractually required to be charged for restoring an amount of reinsurance coverage reduced as the result of a reinsurance loss payment that depletes or exhausts a reinsurance treaty or treaty layer. Reinsurance reinstatement premiums accrued by us are accounted for as a reduction in net premiums earned rather than as an "expense." For certain reinsurance treaties, a ceding commission adjustment is recorded commensurate with a reinstatement premium accrual. A ceding commission is a fee paid by a reinsurance company to a direct writer to cover the costs of issuing the policy and is recorded as a contra-expense.

Reinsurance – An arrangement in which an insurance company, or a reinsurance company, known as the reinsurer, agrees to indemnify another insurance or reinsurance company, known as the ceding company, against all or a portion of the insurance or reinsurance risks underwritten by the ceding company under one or more policies. Reinsurance can provide a ceding company with several benefits, including a reduction in net liability on risks and catastrophe protection from large or multiple losses. Reinsurance does not legally discharge the primary insurer from its liability with respect to its obligations to the insured.

Renewal price(ing) increase or decrease (Core Commercial and Specialty) – Represents the average change in premium on renewed policies caused by the estimated net effect of base rate changes, discretionary pricing, specific inflationary changes or changes in policy level exposure or insured risks.

Renewal price(ing) increase or decrease (Personal Lines) – Represents the average change in premium on policies charged at renewal caused by the net effects of filed rate, inflation adjustments or other changes in policy level exposure or insured risks. Actual written price changes may differ, as not all policies are retained.

Risk based capital ("RBC") – A method of measuring the minimum amount of capital appropriate for an insurance company to support its overall business operations in consideration of its size and risk profile. The RBC ratio for regulatory purposes is calculated as total adjusted capital divided by required risk based capital. Total adjusted capital for our property and casualty companies is capital and surplus, adjusted for the non-tabular reserve discount applicable to our assumed discontinued accident and health insurance business. The Company Action Level is the first level at which regulatory involvement is specified based upon the level of capital.

Regulators may take action for reasons other than triggering various RBC action levels. The various action levels are summarized as follows:

- The Company Action Level, which equals 200% of the Authorized Control Level, requires a company to prepare and submit a RBC plan to the commissioner of the state of domicile. A RBC plan proposes actions which a company may take in order to bring statutory capital above the Company Action Level. After review, the commissioner will notify the company if the plan is satisfactory.
- The Regulatory Action Level, which equals 150% of the Authorized Control Level, requires the insurer to submit to the commissioner of the state of domicile a RBC plan, or if applicable, a revised RBC plan. After examination or analysis, the commissioner will issue an order specifying corrective actions to be taken.
- The Authorized Control Level authorizes the commissioner of the state of domicile to take whatever regulatory actions are considered necessary to protect the best interest of the policyholders and creditors of the insurer.
- The Mandatory Control Level, which equals 70% of the Authorized Control Level, authorizes the commissioner of the state of domicile to take actions necessary to place the company under regulatory control (i.e., rehabilitation or liquidation).

Severity – A monetary increase in the loss costs associated with the same or similar type of event or coverage.

Social inflation – A term used to explain rising insurance claim payouts due to various factors associated with a more costly legal environment, such as increased litigation frequency, expanded theories of liability and higher jury awards. Higher than the expected litigation payouts to plaintiffs due to these and other factors, may then give rise to the initiation of additional lawsuits seeking similarly elevated awards and increasing settlement costs, which can compound the effect.

Specialty – There is no accepted industry definition of "Specialty," but for our purpose Specialty includes four divisions of business: Professional and Executive Lines, Specialty Property and Casualty, Marine, and Surety and Other. Specialty Property and Casualty coverage includes program business (provides commercial insurance to markets with specialized coverage or risk management needs related to groups of similar businesses), specialty industrial and commercial property, excess and surplus lines and specialty general liability coverage. When discussing net premiums written and other financial measures of our specialty businesses, we may include non-specialty premiums that are written as part of the entire account.

Statutory accounting practices – Recording transactions and preparing financial statements in accordance with the rules and procedures prescribed or permitted by insurance regulatory authorities including the National Association of Insurance Commissioners, which in general reflect a liquidating, rather than going concern, concept of accounting.

Underwriting – The process of selecting risks for insurance and determining in what amounts and on what terms the insurance company will accept risks.

Underwriting expenses – Expenses incurred in connection with the acquisition, pricing and administration of a policy or contract, and other insurance company expenses unrelated to claims handling or investments.

Unearned premiums – The portion of a premium representing the unexpired amount of the contract term as of a certain date.

Written premium – The premium assessed for the entire coverage period of an insurance policy or contract without regard to how much of the premium has been earned. See also "Earned premium" above. Net premium written is written premium net of reinsurance.

(1) Ratios may not be comparable to similarly titled measures of other companies.

ITEM 7A–QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Reference is made to "Quantitative and Qualitative Disclosures about Market Risk" in Management's Discussion and Analysis.

ITEM 8 – FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Board of Directors and Shareholders of The Hanover Insurance Group, Inc.

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of The Hanover Insurance Group, Inc. and its subsidiaries (the "Company") as of December 31, 2022 and 2021, and the related consolidated statements of income, of comprehensive income, of shareholders' equity and of cash flows for each of the three years in the period ended December 31, 2022, including the related notes and financial statement schedules I, II, III, V and VI listed in the index appearing under Item 15(a)(2) (collectively referred to as the "consolidated financial statements"). We also have audited the Company's internal control over financial reporting as of December 31, 2022, based on criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

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

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in Management's Report on Internal Control over Financial Reporting appearing under Item 9A. Our responsibility is to express opinions on the Company's consolidated financial statements and on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the 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 audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements 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. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) 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 (iii) 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.

Critical Audit Matters

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 (i) relates to accounts or disclosures that are material to the consolidated financial statements and (ii) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters 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.

Valuation of loss and loss adjustment expense reserves

As described in Notes 1 and 14 to the consolidated financial statements, loss and loss adjustment expense reserves were $7 billion as of December 31, 2022. These liabilities are determined using case basis evaluations and statistical analyses of historical loss patterns and represent estimates of the ultimate cost of all losses incurred but not paid. The loss reserve estimation process relies on the basic assumption that past experience, adjusted for the effects of current developments and likely trends, is an appropriate basis for management to predict future outcomes. As part of this process, management uses a variety of analytical methods that consider experience, trends and other relevant factors, as well as considers numerous quantitative and qualitative factors, including the maturity of the accident year, the level of volatility within a particular class of business, the sufficiency or quality of historical reported and paid loss and loss adjustment expenses information, legal and regulatory developments and changes in underwriting or business mix, claim handling and case reserving practices. The Company's ultimate incurred but not reported ("IBNR") reserves are estimated by management and reserving actuaries on an aggregate basis for each line of business or coverage for loss and loss expense liabilities not reflected within the case reserves. The principal considerations for our determination that performing procedures relating to the valuation of loss and loss adjustment expense reserves is a critical audit matter are the significant judgment by management when developing their estimate. This in turn led to a high degree of auditor judgment, subjectivity and effort in performing procedures and evaluating audit evidence relating to the various analytical methods and factors used by management in developing the estimate, such as historical loss patterns and other relevant quantitative and qualitative factors, which related to the maturity of the accident year, the level of volatility within a particular class of business, and the sufficiency or quality of historical reported and paid loss and loss adjustment expenses information. Also, our audit effort included the involvement of professionals with specialized skill and knowledge to assist in performing procedures and evaluating the audit evidence obtained from these procedures. Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to the Company's valuation of loss and loss adjustment expense reserves, including controls over the analytical methods applied and development of qualitative and quantitative factors. These procedures also included, among others, the involvement of professionals with specialized skill and knowledge to assist in either (i) developing an independent estimate of the reserves using historical loss patterns, and other relevant quantitative and qualitative factors, which related to the maturity of the accident year, the level of volatility within a particular class of business, and the sufficiency or quality of historical reported and paid loss and loss adjustment expenses information, for reserves by line of business or coverage on a test basis, and comparison of this independent estimate to management's actuarially determined reserves; or (ii) on a test basis for reserves by line of business or coverage, evaluating the appropriateness of management's analytical methods and reasonableness of factors for determining the reserve balances. Performing these procedures involved testing the completeness and accuracy of data provided by management.

/s/ PricewaterhouseCoopers LLP

Boston, Massachusetts

February 23, 2023

We have served as the Company's auditor since 1991.

THE HANOVER INSURANCE GROUP, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF INCOME

YEARS ENDED DECEMBER 31	2022	2021	2020
(in millions, except per share data)			
Revenues			
Premiums	**$ 5,252.3**	$ 4,770.2	$ 4,527.4
Net investment income	**296.3**	310.7	265.1
Net realized and unrealized investment gains (losses):			
Net realized gains (losses) from sales and other	**(26.5)**	4.6	17.9
Net change in fair value of equity securities	**(63.3)**	119.1	13.4
Recoveries (impairments) on investments:			
Credit-related recoveries (impairments)	**(1.9)**	0.3	(9.8)
Losses on intent to sell securities	**(14.8)**	(1.0)	(16.5)
	(16.7)	(0.7)	(26.3)
Total net realized and unrealized investment gains (losses)	**(106.5)**	123.0	5.0
Fees and other income	**26.5**	23.9	27.3
Total revenues	**5,468.6**	5,227.8	4,824.8
Losses and expenses			
Losses and loss adjustment expenses	**3,623.4**	3,134.2	2,845.2
Amortization of deferred acquisition costs	**1,093.2**	982.7	951.0
Interest expense	**34.1**	34.0	37.1
Loss on repayment of debt	**—**	—	6.2
Other operating expenses	**573.9**	555.6	540.5
Total losses and expenses	**5,324.6**	4,706.5	4,380.0
Income from continuing operations before income taxes	**144.0**	521.3	444.8
Income tax expense (benefit):			
Current	**73.7**	77.5	105.9
Deferred	**(46.5)**	23.8	(23.1)
Total income tax expense	**27.2**	101.3	82.8
Income from continuing operations	**116.8**	420.0	362.0
Discontinued operations:			
Income from Chaucer business, net of taxes	**—**	1.2	0.4
Loss from discontinued life businesses, net of taxes	**(0.8)**	(2.5)	(3.7)
Net income	**$ 116.0**	$ 418.7	$ 358.7
Earnings per common share:			
Basic:			
Income from continuing operations	**$ 3.28**	$ 11.70	$ 9.61
Discontinued operations:			
Income from Chaucer business, net of taxes	**—**	0.03	0.01
Loss from discontinued life businesses, net of taxes	**(0.02)**	(0.06)	(0.10)
Net income per share	**$ 3.26**	$ 11.67	$ 9.52
Weighted average shares outstanding	**35.6**	35.9	37.7
Diluted:			
Income from continuing operations	**$ 3.23**	$ 11.52	$ 9.50
Discontinued operations:			
Income from Chaucer business, net of taxes	**—**	0.03	0.01
Loss from discontinued life businesses, net of taxes	**(0.02)**	(0.06)	(0.09)
Net income per share	**$ 3.21**	$ 11.49	$ 9.42
Weighted average shares outstanding	**36.1**	36.4	38.1

The accompanying notes are an integral part of these consolidated financial statements.

THE HANOVER INSURANCE GROUP, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

YEARS ENDED DECEMBER 31 *(in millions)*	2022	2021	2020
Net income	**$ 116.0**	$ 418.7	$ 358.7
Other comprehensive income (loss), net of tax:			
Available-for-sale securities:			
Changes in net unrealized gains (losses) on investment securities:			
Having no credit losses recognized in the Consolidated Statements of Income	**(822.6)**	(243.2)	210.6
Having credit losses recognized in the Consolidated Statements of Income	**(3.7)**	—	1.5
Total available-for-sale securities	**(826.3)**	(243.2)	212.1
Pension and postretirement benefits:			
Net actuarial gains (losses) arising in the period	**(5.7)**	(9.8)	3.1
Amortization recognized as net periodic benefit and postretirement cost	**4.3**	2.7	4.7
Total pension and postretirement benefits	**(1.4)**	(7.1)	7.8
Total other comprehensive income (loss), net of tax	**(827.7)**	(250.3)	219.9
Comprehensive income (loss)	**$ (711.7)**	$ 168.4	$ 578.6

The accompanying notes are an integral part of these consolidated financial statements.

THE HANOVER INSURANCE GROUP, INC. AND SUBSIDIARIES
CONSOLIDATED BALANCE SHEETS

DECEMBER 31	2022	2021
(in millions, except share data)		
Assets		
Investments:		
Fixed maturities, at fair value (amortized cost of $8,294.5 and $7,514.8)	**$ 7,481.8**	$ 7,723.9
Equity securities, at fair value	**241.9**	661.3
Other investments	**786.1**	767.4
Total investments	**8,509.8**	9,152.6
Cash and cash equivalents	**305.0**	230.9
Accrued investment income	**54.5**	49.8
Premiums and accounts receivable, net	**1,601.4**	1,469.5
Reinsurance recoverable on paid and unpaid losses and unearned premiums	**1,964.5**	1,907.3
Deferred acquisition costs	**604.8**	552.0
Deferred income tax asset	**199.2**	—
Goodwill	**178.8**	178.8
Other assets	**493.0**	606.3
Assets of discontinued businesses	**86.2**	107.1
Total assets	**$ 13,997.2**	$ 14,254.3
Liabilities		
Loss and loss adjustment expense reserves	**$ 7,012.6**	$ 6,447.6
Unearned premiums	**2,954.2**	2,734.9
Expenses and taxes payable	**731.7**	907.7
Deferred income tax liability	**—**	60.8
Reinsurance premiums payable	**70.3**	55.1
Debt	**782.4**	781.6
Liabilities of discontinued businesses	**120.4**	121.7
Total liabilities	**11,671.6**	11,109.4
Commitments and contingencies		
Shareholders' Equity		
Preferred stock, par value $0.01 per share; 20.0 million shares authorized; none issued	**—**	—
Common stock, par value $0.01 per share; 300.0 million shares authorized; 60.5 million shares issued	**0.6**	0.6
Additional paid-in capital	**1,913.1**	1,887.2
Accumulated other comprehensive income (loss)	**(705.5)**	122.2
Retained earnings	**2,988.8**	2,983.2
Treasury stock at cost (24.9 and 25.0 million shares)	**(1,871.4)**	(1,848.3)
Total shareholders' equity	**2,325.6**	3,144.9
Total liabilities and shareholders' equity	**$ 13,997.2**	$ 14,254.3

The accompanying notes are an integral part of these consolidated financial statements.

THE HANOVER INSURANCE GROUP, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF SHAREHOLDERS' EQUITY

YEARS ENDED DECEMBER 31 *(in millions)*	2022	2021	2020
Preferred Stock			
Balance at beginning and end of year	**$ —**	$ —	$ —
Common Stock			
Balance at beginning and end of year	**0.6**	0.6	0.6
Additional Paid-in Capital			
Balance at beginning of year	**1,887.2**	1,857.4	1,837.3
Settlement and prepayment of accelerated share repurchases	**—**	5.0	4.4
Employee and director stock-based awards and other	**25.9**	24.8	15.7
Balance at end of year	**1,913.1**	1,887.2	1,857.4
Accumulated Other Comprehensive Income (Loss), net of tax			
Net Unrealized Appreciation (Depreciation) on Investments:			
Balance at beginning of year	**184.9**	428.1	216.0
Net appreciation (depreciation) on available-for-sale securities	**(826.3)**	(243.2)	212.1
Balance at end of year	**(641.4)**	184.9	428.1
Defined Benefit Pension and Postretirement Plans:			
Balance at beginning of year	**(62.7)**	(55.6)	(63.4)
Net amount arising in the period	**(5.7)**	(9.8)	3.1
Net amount recognized as net periodic benefit cost	**4.3**	2.7	4.7
Balance at end of year	**(64.1)**	(62.7)	(55.6)
Total accumulated other comprehensive income (loss)	**(705.5)**	122.2	372.5
Retained Earnings			
Balance at beginning of year	**2,983.2**	2,668.0	2,410.9
Cumulative effect of accounting change, net of taxes	**—**	—	(0.9)
Balance at beginning of year, as adjusted	**2,983.2**	2,668.0	2,410.0
Net income	**116.0**	418.7	358.7
Dividends to shareholders	**(110.4)**	(103.5)	(100.7)
Balance at end of year	**2,988.8**	2,983.2	2,668.0
Treasury Stock			
Balance at beginning of year	**(1,848.3)**	(1,696.3)	(1,485.2)
Shares purchased at cost	**(30.8)**	(167.6)	(217.2)
Net shares reissued at cost under employee stock-based compensation plans	**7.7**	15.6	6.1
Balance at end of year	**(1,871.4)**	(1,848.3)	(1,696.3)
Total shareholders' equity	**$ 2,325.6**	$ 3,144.9	$ 3,202.2

The accompanying notes are an integral part of these consolidated financial statements.

THE HANOVER INSURANCE GROUP, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CASH FLOWS

YEARS ENDED DECEMBER 31 *(in millions)*	2022	2021	2020
Cash Flows From Operating Activities			
Net income	**$ 116.0**	$ 418.7	$ 358.7
Adjustments to reconcile net income to net cash provided by operating activities:			
Net loss from repayment of debt	**—**	—	6.2
Net realized investment (gains) losses	**106.4**	(123.5)	(5.1)
Net amortization and depreciation	**12.9**	16.9	18.2
Stock-based compensation expense	**29.0**	22.9	20.1
Amortization of defined benefit plan costs	**5.5**	3.4	6.0
Deferred income tax expense (benefit)	**(46.5)**	23.9	(23.0)
Change in deferred acquisition costs	**(52.8)**	(74.5)	(10.2)
Change in premiums receivable, net of reinsurance premiums payable	**(116.7)**	(123.4)	(84.0)
Change in loss, loss adjustment expense and unearned premium reserves	**784.7**	677.0	437.9
Change in reinsurance recoverable	**(57.2)**	(32.9)	(60.0)
Change in expenses and taxes payable	**3.3**	179.0	67.5
Other, net	**(62.3)**	(163.8)	(24.7)
Net cash provided by operating activities	**722.3**	823.7	707.6
Cash Flows From Investing Activities			
Proceeds from disposals and maturities of fixed maturities	**1,106.3**	1,564.4	1,317.5
Proceeds from disposals of equity securities and other investments	**488.4**	286.3	172.8
Purchase of fixed maturities	**(1,960.2)**	(2,112.7)	(1,829.1)
Purchase of equity securities and other investments	**(124.3)**	(190.2)	(255.1)
Capital expenditures	**(17.8)**	(8.0)	(14.9)
Net cash used in investing activities	**(507.6)**	(460.2)	(608.8)
Cash Flows From Financing Activities			
Proceeds from exercise of employee stock options	**13.3**	20.5	6.3
Proceeds from debt borrowings, net	**—**	—	296.4
Dividends paid to shareholders	**(108.9)**	(102.2)	(99.5)
Repayment of debt	**—**	—	(175.8)
Repurchases of common stock	**(30.8)**	(162.6)	(212.8)
Other financing activities	**(14.2)**	(8.9)	(8.5)
Net cash used in financing activities	**(140.6)**	(253.2)	(193.9)
Net change in cash and cash equivalents	**74.1**	110.3	(95.1)
Cash and cash equivalents, beginning of year	**230.9**	120.6	215.7
Cash and cash equivalents, end of year	**$ 305.0**	$ 230.9	$ 120.6
Supplemental Cash Flow Information			
Interest payments	**$ 33.3**	$ 33.4	$ 33.9
Income tax payments, net	**$ 107.8**	$ 74.0	$ 97.0

The accompanying notes are an integral part of these consolidated financial statements.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

A. BASIS OF PRESENTATION AND PRINCIPLES OF CONSOLIDATION

The consolidated financial statements of The Hanover Insurance Group, Inc. ("THG" or the "Company"), include the accounts of The Hanover Insurance Company ("Hanover Insurance") and Citizens Insurance Company of America ("Citizens"), THG's principal property and casualty companies; and other insurance and non-insurance subsidiaries. These legal entities conduct their operations through several business segments discussed in Note 12 – "Segment Information." The consolidated financial statements also include the Company's discontinued operations, consisting primarily of the Company's former accident and health insurance business.

The preparation of financial statements in conformity with generally accepted accounting principles in the United States of America ("U.S. GAAP") requires the Company to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amount of revenues and expenses during the reporting period. Actual results could differ from those estimates. In the opinion of the Company's management these financial statements reflect all adjustments, consisting of normal recurring items, necessary for a fair presentation of the financial position and results of operations.

B. INVESTMENTS

Fixed maturities are classified as available-for-sale and are carried at fair value, with unrealized gains and losses, net of taxes, reported in accumulated other comprehensive income ("AOCI"), a separate component of shareholders' equity. The amortized cost of fixed maturities is adjusted for amortization of premiums and accretion of discounts to maturity.

Equity securities are carried at fair value. Increases and decreases in fair value are reported in net income.

Other investments consist primarily of mortgage participations and limited partnerships. Mortgage participations represent interests in commercial mortgage loans originated and serviced by a third-party of which the Company shares, on a pro-rata basis, in all related cash flows of the underlying mortgage loans. Mortgage participations are stated at unpaid principal balances adjusted for deferred fees or expenses, net of an allowance for credit losses. Investments in limited partnerships include interests in private equity and real estate funds. Investments in limited partnership interests purchased prior to January 1, 2018, where the Company's interest is so minor that it exercises virtually no influence over operating and financial policies, are accounted for at fair value utilizing the net asset value ("NAV") as a practical expedient to determine fair value. All other limited partnerships are accounted for in accordance with the equity method of accounting.

The Company excludes accrued interest receivable from both the estimated fair value and the amortized cost basis of its investment securities, and reports such amounts separately on the consolidated balance sheets as accrued investment income. When an accrued interest receivable is deemed uncollectible it is written off as a charge to investment income, rather than recorded through an allowance.

Net investment income includes interest, dividends and income from limited partnership interests. Interest income is recognized based on the effective yield method, which includes the amortization of premiums and accretion of discounts. The effective yield used to determine the amortization for fixed maturities subject to prepayment risk, such as mortgage-backed and asset-backed securities, is recalculated and adjusted periodically based upon actual historical and projected future cash flows. The adjustment to yields for highly rated prepayable fixed maturities is accounted for using the retrospective method. The adjustment to yields for all other prepayable fixed maturities is accounted for using the prospective method. Fixed maturities and mortgage participations for which payments are delinquent are placed on non-accrual status, and thereafter interest income is recognized only when cash payments are received.

Realized investment gains and losses on sales are reported as a component of revenues based upon specific identification of the investment assets sold. Impairments are reported as realized investment losses, and include credit losses (and any subsequent recoveries) on fixed maturities and mortgage participations, and intent to sell impairment losses on fixed maturities. Changes in the fair value of equity securities are reported in net realized and unrealized investment gains (losses), including increases and decreases in fair value on securities that are still held, and realized gains and losses on securities that have been sold.

The Company reviews fixed maturity securities in an unrealized loss position and assesses whether it intends to sell the security or more likely than not will be required to sell the security before the recovery of its amortized cost basis. If the debt security meets either of these two criteria, an intent to sell impairment is recognized in earnings equal to the entire difference between the security's amortized cost basis and its fair value at the impairment measurement date. If neither of the above criteria are met, the credit loss portion of the unrealized loss is recorded through earnings and the non-credit portion remains in other comprehensive income. Credit losses are estimated by comparing the amortized cost of the fixed maturity security with the net present value of the security's projected future cash flows, discounted at the effective interest rate implicit in the investment prior to impairment. The non-credit portion of the impairment is equal to the difference between the fair value and the net present value of the security's cash flows at the impairment measurement date. Credit losses are recorded through an allowance for credit losses and recoveries of impairments on fixed maturities are recognized as reversals of the allowance for credit losses. The allowance for credit losses is limited to the amount that fair value is less than amortized cost and therefore, increases in the fair value of investments due to reasons other than credit could result in decreases in the allowance and an increase in net income.

Mortgage participations are pooled by similar risk characteristics and evaluated for credit losses. The allowance for credit losses is calculated using expected loss rates, which vary based on risk factors such as property type, geographic market, and loan-to-value and debt service coverage ratios.

C. FINANCIAL INSTRUMENTS

In the normal course of business, the Company may enter into transactions involving various types of financial instruments, including debt, investments, such as fixed maturities, equity securities and mortgage loans, investment and loan commitments, and certain derivative contracts. These instruments involve credit risk and could also be subject to risk of loss due to interest rate fluctuation. The Company evaluates and monitors each financial instrument individually and, when appropriate, obtains collateral or other security to minimize losses.

D. *CASH AND CASH EQUIVALENTS*

Cash and cash equivalents include cash on hand, amounts due from banks and highly liquid debt instruments purchased with an original maturity of three months or less.

E. DEFERRED ACQUISITION COSTS

Acquisition costs consist of commissions, underwriting costs and other costs, which vary with, and are primarily related to, the successful production of premiums. Acquisition costs are deferred and amortized over the terms of the insurance policies.

Deferred acquisition costs ("DAC") for each operating segment are reviewed to determine if the costs are recoverable from future income, including investment income. If such costs are determined to be unrecoverable, they are expensed at the time of determination. Although recoverability of DAC is not assured, the Company believes it is more likely than not that all of these costs will be recovered. The amount of DAC considered recoverable, however, could be reduced in the near term if the estimates of total revenues discussed above are reduced or permanently impaired as a result of a disposition of a line of business. The amount of amortization of DAC could be revised in the near term if any of the estimates discussed above are revised.

F. REINSURANCE RECOVERABLES

The Company shares certain insurance risks it has underwritten, through the use of reinsurance contracts, with various insurance entities. Reinsurance accounting is followed for ceded transactions when the risk transfer provisions of ASC 944, *Financial Services – Insurance*, have been met. As a result, when the Company experiences loss or claims events that are subject to a reinsurance contract, reinsurance recoverables are recorded. The amount of the reinsurance recoverable can vary based on the terms of the reinsurance contract, the size of the individual loss or claim, the aggregate amount of all losses or claims in a particular line or book of business, or an aggregate amount of losses associated with a particular accident year. The valuation of losses or claims recoverable depends on whether the underlying loss or claim is a reported loss or claim, or an incurred but not reported loss. For reported losses and claims, the Company values reinsurance recoverables at the time the underlying loss or claim is recognized, in accordance with contract terms. For incurred but not reported losses, the Company estimates the amount of reinsurance recoverables based on the terms of the reinsurance contracts and historical reinsurance recovery information and applies that information to the gross loss reserve. Amounts recoverable from reinsurers are estimated in a manner consistent with the claim liability associated with the reinsured business and the balance is disclosed separately in the financial statements. However, the ultimate amount of the reinsurance recoverable is not known until all losses and claims are settled. Allowances are established for amounts deemed uncollectible and reinsurance recoverables are recorded net of these allowances. The Company evaluates the financial condition of its reinsurers and monitors concentration risk to minimize its exposure to significant credit losses from individual reinsurers.

G. PROPERTY, EQUIPMENT, CAPITALIZED SOFTWARE AND LEASES

Property, equipment, leasehold improvements and capitalized software are recorded at cost, less accumulated depreciation and amortization. Depreciation is generally provided using the straight-line method over the estimated useful lives of the related assets, which generally range from 3 to 30 years. The estimated useful life for capitalized software is generally 5 to 7 years. Amortization of leasehold improvements is provided using the straight-line method over the lesser of the term of the lease or the estimated useful life of the improvements.

The Company has entered into operating and financing leases through which it uses "right-of-use" assets that are recorded at the present value of future minimum lease payments, less accumulated depreciation. Depreciation is generally provided using the straight-line method over the estimated useful lives of the related assets, which generally range from 4 to 6 years for real estate and fleet leases.

The Company tests for the recoverability of long-lived assets whenever events or changes in circumstances indicate that the carrying amounts may not be recoverable. The Company recognizes impairment losses only to the extent that the carrying amounts of long-lived assets exceed the sum of the undiscounted cash flows expected to result from the use and eventual disposition of the assets. When an impairment loss occurs, the Company reduces the carrying value of the asset to fair value and no longer depreciates the asset. Fair values are estimated using discounted cash flow analysis.

H. GOODWILL AND INTANGIBLE ASSETS

The Company carries its goodwill at cost, net of amortization accumulated prior to January 1, 2002, and net of impairments. Increases to goodwill are generated through acquisition and represent the excess of the cost of an acquisition over the fair value of net assets acquired, including any intangibles acquired. Since January 1, 2002, goodwill is no longer amortized but, rather, is reviewed for impairment. Additionally, acquisitions can also produce intangible assets, which have either a definite or indefinite life. Intangible assets with definite lives are amortized over that life, whereas those intangible assets determined to have an indefinite life are reviewed at least annually for impairment. At December 31, 2022 and 2021, the Company held goodwill of $178.8 million. At December 31, 2022 and 2021, the Company held intangible assets of $15.5 million and $16.0 million, respectively.

The Company tests for the recoverability of goodwill and intangible assets with indefinite lives annually, or whenever events or changes in circumstances indicate that the carrying amounts may not be recoverable. The Company recognizes impairment losses only to the extent that the carrying amounts of reporting units with goodwill exceed the fair value. The amount of the impairment loss that would be recognized is determined based upon the excess of the carrying value of goodwill compared to the implied fair value of the goodwill, as determined with respect to all assets and liabilities of the reporting unit. The Company performed its annual review of goodwill for impairment in the fourth quarters of 2022 and 2021 with no impairments recognized. During 2022, the Company recognized $0.5 million in impairments related to an intangible asset with an indefinite life. The Company recognized no impairments related to indefinite-lived intangible assets in 2021.

I. LIABILITIES FOR LOSSES, LAE AND UNEARNED PREMIUMS

Liabilities for outstanding claims, losses, and loss adjustment expenses ("LAE") are estimates of payments to be made for reported losses and LAE and estimates of losses and LAE incurred but not reported ("IBNR"). These liabilities are determined using case basis evaluations and statistical analyses of historical loss patterns, and represent estimates of the ultimate cost of all losses incurred but not paid. These estimates are continually reviewed and adjusted as necessary; adjustments are reflected in current operations. Estimated amounts of salvage and subrogation on unpaid losses are deducted from the liability for unpaid claims.

Premiums for direct and assumed business are reported as earned on a pro-rata basis over the contract period. The unexpired portion of these premiums is recorded as unearned premiums.

All losses, LAE and unearned premium liabilities are based on the various estimates discussed in this note. Although the adequacy of these amounts cannot be assured, the Company believes that it is more likely than not that these liabilities and accruals will be sufficient to meet future obligations of policies in force. The amount of liabilities and accruals, however, could be revised in the near-term if the estimates discussed above are revised.

J. DEBT

The Company's debt at December 31, 2022 includes senior and subordinated debentures. Debt instruments are carried at principal amount borrowed, net of any applicable unamortized discounts and issuance costs. See Note 5 – "Debt and Credit Arrangements."

K. PREMIUM, PREMIUM RECEIVABLE, FEE REVENUE AND RELATED EXPENSES

Insurance premiums written are generally recorded at the policy inception and are primarily earned on a pro-rata basis over the terms of the policies for all products. Premiums written may also include estimates that are derived from multiple sources, which include the historical experience of the underlying business, similar businesses, and available industry information. These estimates are regularly reviewed and updated, and any resulting adjustments are included in the current year's results. Unearned premium reserves represent the portion of premiums written that relates to the unexpired terms of the underlying in-force insurance policies and reinsurance contracts. Premium receivables reflect the unpaid balance of premiums written as of the balance sheet date. Premium receivables are generally short-term in nature and are reported net of an allowance for estimated uncollectible premium accounts. The Company reviews its receivables for collectability at the balance sheet date. The allowance for uncollectible accounts was not material as of December 31, 2022 and 2021. Ceded premiums are charged to income over the applicable term of the various reinsurance contracts with third-party reinsurers. Reinsurance reinstatement premiums, when required, are recognized in the same period as the loss event that gave rise to the reinstatement premiums. Losses and related expenses are matched with premiums, resulting in their recognition over the lives of the contracts. This matching is accomplished through estimated and unpaid losses and amortization of deferred acquisition costs.

L. INCOME TAXES

The Company is subject to the tax laws and regulations of the U.S. federal jurisdiction and various state jurisdictions. The Company files a consolidated U.S. federal income tax return that includes the holding company and its U.S. subsidiaries. Generally, taxes are accrued at the U.S. statutory tax rate of 21%.

The Company's accounting for income taxes represents its best estimate of various events and transactions.

Deferred income taxes are generally recognized when assets and liabilities have different values for financial statement and tax reporting purposes, and for other temporary taxable and deductible differences as defined by ASC 740, *Income Taxes* ("ASC 740"). These

temporary differences are measured at the balance sheet date using enacted tax rates expected to apply to taxable income in the years the temporary differences are expected to reverse. These differences result primarily from insurance reserves, investments, deferred acquisition costs, software capitalization and employee benefit plans.

The realization of deferred tax assets depends upon the existence of sufficient taxable income within the carryback or carryforward periods under U.S. federal tax law. Consideration is given to all available positive and negative evidence, including reversals of deferred tax liabilities, projected future taxable income, tax planning strategies and recent financial operations. Valuation allowances are established if, based on available information, it is determined that it is more likely than not that all or some portion of the deferred tax assets will not be realized. Changes in valuation allowances are generally reflected in income tax expense or as an adjustment to other comprehensive income (loss), depending on the nature of the item for which the valuation allowance is being recorded.

M. STOCK-BASED COMPENSATION

The Company recognizes the fair value of compensation costs for all share-based payments, including employee stock options, in the financial statements. Unvested awards are generally expensed on a straight-line basis, by tranche, over the vesting period of the award. The Company's stock-based compensation plans are discussed further in Note 9 – "Stock-Based Compensation Plans."

N. EARNINGS PER SHARE

Earnings per share ("EPS") for the years ended December 31, 2022, 2021 and 2020 is based on a weighted average of the number of shares outstanding during each year. Basic and diluted EPS is computed by dividing income available to common stockholders by the weighted average number of shares outstanding for the period. The weighted average shares outstanding used to calculate basic EPS differ from the weighted average shares outstanding used in the calculation of diluted EPS due to the effect of dilutive employee stock options, nonvested stock grants, and other contingently issuable shares. If the effect of such items is antidilutive, the weighted average shares outstanding used to calculate diluted EPS would be equal to those used to calculate basic EPS.

Options to purchase shares of common stock whose exercise prices are greater than the average market price of the common shares are not included in the computation of diluted earnings per share because the effect would be antidilutive.

O. NEW ACCOUNTING PRONOUNCEMENTS

Recently Implemented Standards

The Company did not adopt any new accounting standards during the year ended December 31, 2022. An assessment was made regarding the effect that adoption of recently issued accounting standards by the Financial Accounting Standards Board ("FASB") would have on the Company's consolidated financial statements. There were no new accounting standards issued in the year ended December 31, 2022 that are expected to have a material effect on the Company's financial position or results of operations.

In October 2020, the FASB issued Accounting Standards Codification ("ASC") Update No. 2020-08, *Codification Improvements to Subtopic 310-20, Receivables – Nonrefundable Fees and Other Costs*. This guidance clarifies, for each reporting period, that an entity should reevaluate whether a callable debt security with multiple call dates is required to amortize any premium to the next call date. The updated guidance is effective for annual and interim periods beginning after December 15, 2020 and should be applied on a prospective basis as of the beginning of the period of adoption for existing or newly purchased callable debt securities. The Company implemented this guidance effective January 1, 2021, and it did not have a material impact on its financial position or results of operations.

In January 2020, the FASB issued ASC Update No. 2020-01, *Investments – Equity Securities (Topic 321), Investments – Equity Method and Joint Ventures (Topic 323), and Derivatives and Hedging (Topic 815)*. This ASC update clarifies that an entity should consider observable transactions that require it to either apply or discontinue the equity method of accounting when using the measurement alternative under ASC 321. This update also clarifies the accounting for certain forward contracts and purchased options accounted for under ASC 815. The updated guidance is effective for annual and interim periods beginning after December 15, 2020. The Company implemented this guidance effective January 1, 2021, and it did not have a material impact on its financial position or results of operations.

In December 2019, the FASB issued ASC Update No. 2019-12, *Income Taxes (Topic 740) – Simplifying the Accounting for Income Taxes*. This ASC update removes certain exceptions to the general principles in ASC 740, including intraperiod tax allocation when there is a loss from continuing operations, foreign subsidiary treatment under certain conditions and for calculating interim income taxes when the year-to-date loss exceeds the anticipated loss. This update also clarifies and amends existing guidance related to changes in tax laws, business combinations and employee stock plans, among others. The updated guidance is effective for interim and annual periods beginning after December 15, 2020. The Company implemented this guidance effective January 1, 2021, and it did not have a material impact on its financial position or results of operations.

P. RECLASSIFICATIONS

Certain prior year amounts have been reclassified to conform to the current year presentation, when applicable.

2. INVESTMENTS

A. FIXED MATURITIES

The amortized cost and fair value of available-for-sale fixed maturities were as follows:

DECEMBER 31, 2022
(in millions)

	Amortized Cost	*Allowance for Credit Losses*	*Amortized Cost, Net of Allowance for Credit Losses*	*Gross Unrealized Gains*	*Gross Unrealized Losses*	*Fair Value*
U.S. Treasury and government agencies	**$ 478.9**	**$ —**	**$ 478.9**	**$ 0.2**	**$ 58.9**	**$ 420.2**
Foreign government	**2.3**	**—**	**2.3**	**—**	**0.1**	**2.2**
Municipal	**1,239.5**	**—**	**1,239.5**	**0.8**	**164.2**	**1,076.1**
Corporate	**4,066.4**	**(2.1)**	**4,064.3**	**3.3**	**337.7**	**3,729.9**
Residential mortgage-backed	**1,215.3**	**—**	**1,215.3**	**0.6**	**142.1**	**1,073.8**
Commercial mortgage-backed	**924.1**	**—**	**924.1**	**—**	**87.7**	**836.4**
Asset-backed	**370.1**	**—**	**370.1**	**0.1**	**27.0**	**343.2**
Total fixed maturities	**$ 8,296.6**	**$ (2.1)**	**$ 8,294.5**	**$ 5.0**	**$ 817.7**	**$ 7,481.8**

DECEMBER 31, 2021
(in millions)

	Amortized Cost	*Allowance for Credit Losses*	*Amortized Cost, Net of Allowance for Credit Losses*	*Gross Unrealized Gains*	*Gross Unrealized Losses*	*Fair Value*
U.S. Treasury and government agencies	$ 394.3	$ —	$ 394.3	$ 9.3	$ 7.4	$ 396.2
Foreign government	2.2	—	2.2	0.4	—	2.6
Municipal	1,176.2	—	1,176.2	32.6	8.0	1,200.8
Corporate	3,931.5	(0.3)	3,931.2	174.5	15.6	4,090.1
Residential mortgage-backed	1,068.2	—	1,068.2	12.4	11.0	1,069.6
Commercial mortgage-backed	802.4	—	802.4	26.6	4.6	824.4
Asset-backed	140.3	—	140.3	1.3	1.4	140.2
Total fixed maturities	$ 7,515.1	$ (0.3)	$ 7,514.8	$ 257.1	$ 48.0	$ 7,723.9

The Company enters into various agreements that may require its fixed maturities to be held as collateral by others. At December 31, 2022 and 2021, fixed maturities with fair values of $132.5 million and $106.6 million, respectively, were held as collateral for the FHLB collateralized borrowing program. See Note 5 — "Debt and Credit Arrangements" for additional information related to the Company's FHLB program. Additionally, at December 31, 2022 and 2021, fixed maturities with fair values of $281.7 million and $303.4 million, respectively, were on deposit with various state governmental authorities or trustees.

The amortized cost and fair value by maturity periods for fixed maturities are shown in the following table. Actual maturities may differ from contractual maturities because borrowers may have the right to call or prepay obligations with or without call or prepayment penalties, or the Company may have the right to put or sell the obligations back to the issuers.

DECEMBER 31	**2022**	
(in millions)	*Amortized Cost, net of Allowance for Credit Losses*	*Fair Value*
Due in one year or less	**$ 318.7**	**$ 316.3**
Due after one year through five years	**2,433.5**	**2,326.4**
Due after five years through ten years	**2,644.5**	**2,264.6**
Due after ten years	**388.3**	**321.1**
	5,785.0	**5,228.4**
Mortgage-backed and asset-backed securities	**2,509.5**	**2,253.4**
Total fixed maturities	**$ 8,294.5**	**$ 7,481.8**

B. UNREALIZED GAINS AND LOSSES

Unrealized gains and losses on available-for-sale fixed maturities are summarized in the following table.

YEARS ENDED DECEMBER 31 *(in millions)*	2022	2021	2020
Net appreciation, beginning of year	**$ 184.9**	$ 428.1	$ 216.0
Net appreciation (depreciation) on available-for-sale fixed maturities	**(1,044.2)**	(302.1)	280.2
Benefit (provision) for deferred income taxes	**217.9**	58.9	(68.1)
	(826.3)	(243.2)	212.1
Net appreciation (depreciation), end of year	**$ (641.4)**	$ 184.9	$ 428.1

C. FIXED MATURITY SECURITIES IN AN UNREALIZED LOSS POSITION

The following tables provide information about the Company's available-for-sale fixed maturity securities that were in an unrealized loss position at December 31, 2022 and 2021, including the length of time the securities have been in an unrealized loss position:

DECEMBER 31, 2022 *(in millions)*	*12 months or less*		*Greater than 12 months*		*Total*	
	Gross Unrealized Losses	*Fair Value*	*Gross Unrealized Losses*	*Fair Value*	*Gross Unrealized Losses*	*Fair Value*
Investment grade:						
U.S. Treasury and government agencies	**$ 15.8**	**$ 237.3**	**$ 43.1**	**$ 160.7**	**$ 58.9**	**$ 398.0**
Foreign governments	**0.1**	**1.9**	**—**	**—**	**0.1**	**1.9**
Municipal	**64.9**	**595.5**	**99.3**	**386.6**	**164.2**	**982.1**
Corporate	**202.2**	**2,786.2**	**118.2**	**489.8**	**320.4**	**3,276.0**
Residential mortgage-backed	**51.6**	**642.0**	**90.5**	**387.6**	**142.1**	**1,029.6**
Commercial mortgage-backed	**48.7**	**663.2**	**39.0**	**164.4**	**87.7**	**827.6**
Asset-backed	**11.0**	**234.8**	**16.0**	**75.1**	**27.0**	**309.9**
Total investment grade	**394.3**	**5,160.9**	**406.1**	**1,664.2**	**800.4**	**6,825.1**
Below investment grade:						
Corporate	**13.5**	**253.2**	**3.8**	**17.3**	**17.3**	**270.5**
Total fixed maturities	**$ 407.8**	**$ 5,414.1**	**$ 409.9**	**$ 1,681.5**	**$ 817.7**	**$ 7,095.6**

DECEMBER 31, 2021 *(in millions)*	*12 months or less*		*Greater than 12 months*		*Total*	
	Gross Unrealized Losses	*Fair Value*	*Gross Unrealized Losses*	*Fair Value*	*Gross Unrealized Losses*	*Fair Value*
Investment grade:						
U.S. Treasury and government agencies	$ 2.3	$ 98.0	$ 5.1	$ 101.3	$ 7.4	$ 199.3
Municipal	7.9	480.8	0.1	2.5	8.0	483.3
Corporate	13.6	599.6	0.4	7.5	14.0	607.1
Residential mortgage-backed	11.0	653.5	—	—	11.0	653.5
Commercial mortgage-backed	4.6	204.0	—	—	4.6	204.0
Asset-backed	1.4	91.5	—	—	1.4	91.5
Total investment grade	40.8	2,127.4	5.6	111.3	46.4	2,238.7
Below investment grade:						
Corporate	1.6	95.8	—	—	1.6	95.8
Total fixed maturities	$ 42.4	$ 2,223.2	$ 5.6	$ 111.3	$ 48.0	$ 2,334.5

The Company views gross unrealized losses on fixed maturities as non-credit related and through its assessment of unrealized losses has determined that these securities will recover, allowing the Company to realize the anticipated long-term economic value. The Company currently does not intend to sell, nor does it expect to be required to sell these securities before recovery of their amortized cost. The Company employs a systematic methodology to evaluate declines in fair value below amortized cost for fixed maturity securities. In determining impairments, the Company evaluates several factors and circumstances, including the issuer's overall financial condition; the issuer's credit and financial strength ratings; the issuer's financial performance, including earnings trends and asset quality; any specific events which may influence the operations of the issuer; the general outlook for market conditions in the industry or geographic region in which the issuer operates; and the degree to which the fair value of an issuer's securities is below the Company's amortized cost. The Company also considers any factors that might raise doubt about the issuer's ability to make contractual payments as they come due and whether the Company expects to recover the entire amortized cost basis of the security.

D. OTHER INVESTMENTS

The Company's mortgage participations and other mortgage loans were $388.6 million and $434.0 million at December 31, 2022 and 2021, respectively. Participating interests in commercial mortgage loans are originated and serviced by a third-party. For these investments, the Company shares, on a pro-rata basis, in all related cash flows of the underlying mortgages. Mortgage participations and other mortgage loans were comprised of the following property types and geographic locations.

DECEMBER 31 *(in millions)*	2022	2021
Property Type:		
Office	**$ 149.3**	$ 154.8
Apartments	**103.9**	125.5
Retail	**52.7**	61.4
Hotel	**48.9**	62.0
Industrial	**37.0**	37.4
Allowance for credit losses	**(3.2)**	(7.1)
Total	**$ 388.6**	$ 434.0

DECEMBER 31 *(in millions)*	2022	2021
Geographic Region:		
South Atlantic	**$ 103.2**	$ 108.8
Pacific	**92.5**	93.0
Mid-Atlantic	**58.1**	58.9
New England	**47.8**	58.2
West South Central	**33.0**	48.6
East North Central	**21.0**	27.7
Mountain	**13.6**	18.5
Other	**22.6**	27.4
Allowance for credit losses	**(3.2)**	(7.1)
Total	**$ 388.6**	$ 434.0

At December 31, 2022, scheduled maturities of mortgage participations and other loans were as follows: due in 2023 - $6.7 million; in 2024 - $46.4 million; 2025 - $96.3 million; 2026 - $51.5 million and thereafter - $187.7 million. Actual maturities could differ from contractual maturities because borrowers may have the right to prepay obligations with or without prepayment penalties, and loans may be refinanced. During 2022, the Company did not refinance any loans based on terms that differed from current market rates.

In determining estimated credit losses on mortgage participations and other loans, the Company evaluates several factors, including credit risk. The amortized cost of mortgage participations and other loans by credit ratings and year of origination was as follows:

DECEMBER 31, 2022 *(in millions)*	Year of Origination						
	Prior to 2018	2018	2019	2020	2021	2022	Total
Credit Quality							
Aaa/Aa/A	**$ 137.7**	**$ 36.0**	**$ 47.2**	**$ 27.3**	**$ 61.7**	**$ 10.0**	**$ 319.9**
Baa	**37.4**	**—**	**—**	**—**	**—**	**—**	**37.4**
Ba and lower	**28.5**	**—**	**—**	**6.0**	**—**	**—**	**34.5**
Amortized cost	**$ 203.6**	**$ 36.0**	**$ 47.2**	**$ 33.3**	**$ 61.7**	**$ 10.0**	**$ 391.8**
Allowance for credit losses							**(3.2)**
Amortized cost, net of allowance for credit losses							**$ 388.6**

Other investments also include interests in limited partnerships of $387.9 million and $319.9 million at December 31, 2022 and December 31, 2021, respectively.

E. OTHER

At December 31, 2022 and 2021, the Company's exposure to concentration of investments in a single investee that exceeded 10% of shareholders' equity included securities of the U.S. government and U.S. government-sponsored agencies, as well as mortgage participations with a highly rated single third-party of $388.6 million and $425.7 million, respectively.

At December 31, 2022, there were contractual investment commitments of up to $231.6 million.

3. INVESTMENT INCOME AND GAINS AND LOSSES

A. NET INVESTMENT INCOME

The components of net investment income were as follows:

YEARS ENDED DECEMBER 31 *(in millions)*	2022	2021	2020
Fixed maturities	**$ 239.3**	$ 216.9	$ 222.5
Limited partnerships	**35.7**	68.2	16.7
Mortgage loans	**16.1**	18.0	17.5
Equity securities	**12.0**	15.6	14.8
Other investments	**4.6**	3.0	3.2
Gross investment income	**307.7**	321.7	274.7
Less: investment expenses	**(11.4)**	(11.0)	(9.6)
Net investment income	**$ 296.3**	$ 310.7	$ 265.1

The change in fair value of limited partnerships measured using NAV is reported in net investment income, of which $2.0 million of holding losses were related to securities still owned at December 31, 2022, $17.1 million of holding gains and $6.9 million of holding losses were related to securities still owned at December 31, 2021 and 2020, respectively.

There were no fixed maturity securities on non-accrual status at December 31, 2022 or 2021, and there was no effect on income for the year ended December 31, 2022. The effects of non-accruals for the years ended December 31, 2021 and 2020, compared with amounts of net investment income that would have been recognized in accordance with the original terms of the fixed maturities were not material.

B. NET REALIZED AND UNREALIZED INVESTMENT GAINS AND LOSSES

Net realized and unrealized gains (losses) on investments, including impairments, were as follows:

YEARS ENDED DECEMBER 31 *(in millions)*	2022	2021	2020
Equity securities	**$ (63.3)**	$ 119.1	$ 13.4
Fixed maturities	**(45.2)**	1.7	(4.2)
Other investments	**(0.3)**	1.5	2.5
Mortgage loans	**2.3**	0.7	(6.7)
Net realized and unrealized investment gains	**$ (106.5)**	$ 123.0	$ 5.0

The following table provides pre-tax net realized and unrealized gains (losses) on equity securities:

YEARS ENDED DECEMBER 31 *(in millions)*	2022	2021	2020
Net gains (losses) recognized during the period	**$ (63.3)**	$ 119.1	$ 13.4
Less: net gains (losses) recognized on equity securities sold during the period	**(42.7)**	2.2	(19.8)
Net unrealized gains (losses) recognized during the period on equity securities still held	**$ (20.6)**	$ 116.9	$ 33.2

Impairments

Included in net realized and unrealized investment gains (losses) for the years ended December 31, 2022, 2021 and 2020, were net impairments of investment securities totaling $16.7 million, $0.7 million and $26.3 million, respectively. In 2022, impairments consisted of $18.5 million on fixed maturities, partially offset by recoveries of $1.8 million of estimated credit losses on mortgage loans. Impairments on fixed maturities included $14.8 million related to intent to sell securities and $3.7 million of estimated credit losses. In 2021, impairments consisted of $1.3 million on fixed maturities, offset by recoveries of $0.6 million of estimated credit losses on mortgage loans. In 2020, impairments primarily consisted of $17.6 million on fixed maturities and $6.7 million of estimated credit losses on mortgage loans. Impairments on fixed maturities included $16.5 million relating to intent to sell securities and $1.1 million of estimated credit losses.

At December 31, 2022 and 2021, the allowance for credit losses on mortgage loans was $3.2 million and $7.1 million, respectively, and the allowance for credit losses on available-for-sale securities was $2.1 million and $0.3 million, respectively.

The methodology and significant inputs used to measure the amount of credit losses were as follows:

> Fixed maturities, Corporate bonds – the Company utilized a financial model that derives expected cash flows based on probability-of-default factors by credit rating and asset duration, and loss-given-default factors based on security type. These factors are based on historical data provided by an independent third-party rating agency. In addition, other qualitative market data relevant to the realizability of contractual cash flows may be considered, including current conditions and reasonable and supportable forecasts.

Mortgage loans – the Company estimated losses by applying expected loss rates, which are based on historical data. Embedded in expected loss rates are mortgage risk ratings and risk factors associated with property type such as office, retail, lodging, multi-family and industrial. Risk ratings, based on property characteristics and metrics including the geographic market, are predominantly driven by estimates of loan-to-value and debt service coverage ratios. Ratings may be adjusted to reflect current conditions and to incorporate reasonable and supportable forecasts, such as volatility of cash flows and valuation.

The proceeds from sales of available-for-sale fixed maturities, and the gross realized gains and gross realized losses on those sales, were as follows:

YEARS ENDED DECEMBER 31	2022	2021	2020
(in millions)			
Proceeds from sales	**$ 489.0**	$ 485.0	$ 264.1
Gross gains	**4.4**	6.4	9.9
Gross losses	**34.1**	16.9	2.9

4. FAIR VALUE

Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability, i.e., exit price, in an orderly transaction between market participants. The Company emphasizes the use of observable market data whenever available in determining fair value. Fair values presented for certain financial instruments are estimates which, in many cases, may differ significantly from the amounts that could be realized upon immediate liquidation. A hierarchy of the three broad levels of fair value is as follows, with the highest priority given to Level 1 as these are the most observable, and the lowest priority given to Level 3:

Level 1 – Unadjusted quoted prices in active markets for identical assets or liabilities.

Level 2 – 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, or other inputs that are observable or can be corroborated by observable market data, including model-derived valuations.

Level 3 – Unobservable inputs that are supported by little or no market activity.

When more than one level of input is used to determine fair value, the financial instrument is classified as Level 2 or Level 3 according to the lowest level input that has a significant impact on the fair value measurement.

The following methods and assumptions were used to estimate the fair value of each class of financial instruments and have not changed since last year.

FIXED MATURITIES

Level 1 securities generally include U.S. Treasury issues and other securities that are highly liquid, and for which quoted market prices are available. Level 2 securities are valued using pricing for similar securities and pricing models that incorporate observable inputs including, but not limited to, yield curves and issuer spreads. Level 3 securities include issues for which little observable data can be obtained, primarily due to the illiquid nature of the securities, and for which significant inputs used to determine fair value are based on the Company's own assumptions.

The Company utilizes third party pricing services for the valuation of the majority of its fixed maturity securities and receives one quote per security. When quoted market prices in an active market are available, they are provided by the pricing service as the fair value and such values are classified as Level 1. Since fixed maturities other than U.S. Treasury securities generally do not trade on a daily basis, the pricing services prepare estimates of fair value for those securities using pricing techniques based on a market approach. Inputs into the fair value pricing common to all asset classes include: benchmark U.S. Treasury security yield curves; reported trades of identical or similar fixed maturity securities; broker/dealer quotes of identical or similar fixed maturity securities and structural characteristics such as maturity date, coupon, mandatory principal payment dates, frequency of interest and principal payments, and optional redemption features. Inputs into the fair value applications that are unique by asset class include, but are not limited to:

- U.S. government agencies – determination of direct versus indirect government support and whether any contingencies exist with respect to the timely payment of principal and interest.
- Foreign government – estimates of appropriate market spread versus underlying related sovereign treasury curve(s) dependent on liquidity and direct or contingent support.
- Municipals – overall credit quality, including assessments of the level and variability of: sources of payment such as income, sales or property taxes, levies or user fees; credit support such as insurance; state or local economic and political base; natural resource availability; and susceptibility to natural or man-made catastrophic events such as hurricanes, earthquakes or acts of terrorism.

- Corporate fixed maturities – overall credit quality, including assessments of the level and variability of: economic sensitivity; liquidity; corporate financial policies; management quality; regulatory environment; competitive position; ownership; restrictive covenants; and security or collateral.
- Residential mortgage-backed securities – estimates of prepayment speeds based upon: historical prepayment rate trends; underlying collateral interest rates; geographic concentration; vintage year; borrower credit quality characteristics; interest rate and yield curve forecasts; government or monetary authority support programs; tax policies; and delinquency/default trends; and in the case of non-agency collateralized mortgage obligations, severity of loss upon default and length of time to recover proceeds following default.
- Commercial mortgage-backed securities – overall credit quality, including assessments of the value and supply/demand characteristics of: collateral type such as office, retail, residential, lodging, or other; geographic concentration by region, state, metropolitan statistical area and locale; vintage year; historical collateral performance including defeasance, delinquency, default and special servicer trends; and capital structure support features.
- Asset-backed securities – overall credit quality, including assessments of the underlying collateral type such as credit card receivables, automobile loan receivables and equipment lease receivables; geographic diversification; vintage year; historical collateral performance including delinquency, default and casualty trends; economic conditions influencing use rates and resale values; and contract structural support features.

Generally, all prices provided by the pricing services, except actively traded securities with quoted market prices, are reported as Level 2.

The Company holds privately placed fixed maturity securities and certain other fixed maturity securities that do not have an active market and for which the pricing services cannot provide fair values. The Company determines fair values for these securities using either matrix pricing, which utilizes the market approach, or broker quotes. The Company will use observable market data as inputs into the fair value techniques, as discussed in the determination of Level 2 fair values, to the extent it is available, but is also required to use a certain amount of unobservable judgment due to the illiquid nature of the securities involved. Unobservable judgment reflected in the Company's matrix model accounts for estimates of additional spread required by market participants for factors such as issue size, credit stress, structural complexity, high bond coupon or other unique features. These matrix-priced securities are reported as Level 2 or Level 3, depending on the significance of the impact of unobservable judgment on the security's value. Additionally, the Company may obtain non-binding broker quotes, which are reported as Level 3.

EQUITY SECURITIES

Level 1 consists of publicly traded securities, including exchange traded funds, valued at quoted market prices. Level 2 includes securities that are valued using pricing for similar securities and pricing models that incorporate observable inputs. Level 3 consists of common or preferred stock of private companies for which observable inputs are not available.

The Company utilizes a third-party pricing service for the valuation of the majority of its equity securities and receives one quote for each equity security. When quoted market prices in an active market are available, they are provided by the pricing service as the fair value, and such values are classified as Level 1. The Company holds certain equity securities that have been issued by privately-held entities that do not have an active market and for which the pricing service cannot provide fair values. The Company estimates fair value for these securities based on prices from recent financing rounds, which may be adjusted for liquidity and other factors, or based on the issuer's book value and market multiples, and reports them as Level 3. Additionally, the Company may obtain non-binding broker quotes, which are reported as Level 3.

OTHER INVESTMENTS

Other investments primarily include mortgage participations and limited partnerships not subject to the equity method of accounting. The fair values of limited partnerships not subject to the equity method of accounting are based on the NAV provided by the general partner, adjusted for recent financial information, and are excluded from the fair value hierarchy.

The estimated fair values of the financial instruments were as follows:

(in millions)	December 31, 2022 Carrying Value	December 31, 2022 Fair Value	December 31, 2021 Carrying Value	December 31, 2021 Fair Value
Financial Assets carried at:				
Fair Value through AOCI:				
Fixed maturities	**$ 7,481.8**	**$ 7,481.8**	$ 7,723.9	$ 7,723.9
Fair Value through Net Income:				
Equity securities	**241.9**	**241.9**	661.3	661.3
Other investments	**131.8**	**131.8**	143.8	143.8
Amortized Cost/Cost:				
Other investments	**432.3**	**401.0**	450.8	472.9
Cash and cash equivalents	**305.0**	**305.0**	230.9	230.9
Total financial instruments	**$ 8,592.8**	**$ 8,561.5**	$ 9,210.7	$ 9,232.8
Financial Liabilities carried at:				
Amortized Cost:				
Debt	**$ 782.4**	**$ 713.9**	$ 781.6	$ 845.5

The Company has processes designed to ensure that the values received from its third-party pricing services are accurately recorded, that the data inputs and valuation approaches and techniques utilized are appropriate and consistently applied, and that the assumptions are reasonable and consistent with the objective of determining fair value. The Company reviews the pricing services' policies describing its methodology, processes, practices and inputs, including various financial models used to value securities. For assets carried at fair value, the Company performs a review of the fair value hierarchy classifications and of prices received from its pricing services on a quarterly basis. Also, the Company reviews the portfolio pricing, including a process for which securities with changes in prices that exceed a defined threshold are verified to independent sources, if available. If upon review, the Company is not satisfied with the validity of a given price, a pricing challenge would be submitted to the pricing service along with supporting documentation for its review. The Company does not adjust quotes or prices obtained from the pricing services unless the pricing service agrees with the Company's challenge. During 2022 and 2021, the Company did not adjust any prices received from its pricing services.

Changes in the observability of valuation inputs may result in a reclassification of certain financial assets or liabilities within the fair value hierarchy. As previously discussed, the Company utilizes third-party pricing services for the valuation of the majority of its fixed maturities and equity securities. The pricing services have indicated that they will only produce an estimate of fair value if there is objectively verifiable information to produce a valuation. If a pricing service discontinues pricing an investment, the Company will use observable market data to the extent it is available, but may also be required to make assumptions for market based inputs that are unavailable due to market conditions.

The following tables provide, for each hierarchy level, the Company's investment assets that were measured at fair value on a recurring basis.

(in millions)	DECEMBER 31, 2022 Total	Level 1	Level 2	Level 3
Fixed maturities:				
U.S. Treasury and government agencies	**$ 420.2**	**$ 282.7**	**$ 137.5**	**$ —**
Foreign government	**2.2**	**—**	**2.2**	**—**
Municipal	**1,076.1**	**—**	**1,066.8**	**9.3**
Corporate	**3,729.9**	**—**	**3,729.8**	**0.1**
Residential mortgage-backed, U.S. agency backed	**974.0**	**—**	**974.0**	**—**
Residential mortgage-backed, non-agency	**99.8**	**—**	**99.8**	**—**
Commercial mortgage-backed	**836.4**	**—**	**828.9**	**7.5**
Asset-backed	**343.2**	**—**	**343.2**	**—**
Total fixed maturities	**7,481.8**	**282.7**	**7,182.2**	**16.9**
Equity securities	**241.9**	**234.4**	**—**	**7.5**
Other investments	**3.6**	**—**	**—**	**3.6**
Total investment assets at fair value	**$ 7,727.3**	**$ 517.1**	**$ 7,182.2**	**$ 28.0**

(in millions)	DECEMBER 31, 2021 Total	Level 1	Level 2	Level 3
Fixed maturities:				
U.S. Treasury and government agencies	$ 396.2	$ 221.5	$ 174.7	$ —
Foreign government	2.6	—	2.6	—
Municipal	1,200.8	—	1,186.8	14.0
Corporate	4,090.1	—	4,090.0	0.1
Residential mortgage-backed	1,069.6	—	1,069.6	—
Commercial mortgage-backed	824.4	—	813.1	11.3
Asset-backed	140.2	—	140.2	—
Total fixed maturities	7,723.9	221.5	7,477.0	25.4
Equity securities	661.3	651.2	—	10.1
Other investments	4.3	—	—	4.3
Total investment assets at fair value	$ 8,389.5	$ 872.7	$ 7,477.0	$ 39.8

Limited partnerships measured at fair value using the NAV based on an ownership interest in partners' capital have not been included in the hierarchy tables. At December 31, 2022 and 2021, the fair values of these investments were $128.2 million and $139.5 million, respectively, less than 2% of total investment assets.

The following tables provide, for each hierarchy level, the Company's estimated fair values of financial instruments that were not carried at fair value.

(in millions)	DECEMBER 31, 2022 Total	Level 1	Level 2	Level 3
Assets:				
Cash and cash equivalents	**$ 305.0**	**$ 305.0**	**$ —**	**$ —**
Other investments	**401.0**	**—**	**6.0**	**395.0**
Total financial instruments	**$ 706.0**	**$ 305.0**	**$ 6.0**	**$ 395.0**
Liabilities:				
Debt	**$ 713.9**	**$ —**	**$ 713.9**	**$ —**

(in millions)	DECEMBER 31, 2021 Total	Level 1	Level 2	Level 3
Assets:				
Cash and cash equivalents	$ 230.9	$ 230.9	$ —	$ —
Other investments	472.9	—	2.8	470.1
Total financial instruments	$ 703.8	$ 230.9	$ 2.8	$ 470.1
Liabilities:				
Debt	$ 845.5	$ —	$ 845.0	$ —

The following tables provide a reconciliation for all assets measured at fair value on a recurring basis using significant unobservable inputs (Level 3).

YEAR ENDED DECEMBER 31, 2022	Fixed Maturities					
(in millions)	Municipal	Corporate	Commercial mortgage-backed	Total	Equity and Other	Total Assets
Balance at beginning of year	**$ 14.0**	**$ 0.1**	**$ 11.3**	**$ 25.4**	**$ 14.4**	**$ 39.8**
Total losses:						
Included in total net realized and unrealized investment losses	**—**	**—**	**—**	**—**	**(3.3)**	**(3.3)**
Included in other comprehensive loss - net depreciation on available-for-sale securities	**(1.1)**	**—**	**(1.1)**	**(2.2)**	**—**	**(2.2)**
Sales	**(3.6)**	**—**	**(2.7)**	**(6.3)**	**—**	**(6.3)**
Balance at end of year	**$ 9.3**	**$ 0.1**	**$ 7.5**	**$ 16.9**	**$ 11.1**	**$ 28.0**
Changes in unrealized losses for the period included in other comprehensive loss for assets held at the end of the year	**$ (1.1)**	**$ —**	**$ (1.1)**	**$ (2.2)**	**$ —**	**$ (2.2)**

YEAR ENDED DECEMBER 31, 2021	Fixed Maturities					
(in millions)	Municipal	Corporate	Commercial mortgage-backed	Total	Equity and Other	Total Assets
Balance at beginning of year	$ 7.0	$ 0.5	$ 12.4	$ 19.9	$ 9.5	$ 29.4
Total gains (losses):						
Included in total net realized and unrealized investment gains	—	—	—	—	4.6	4.6
Included in other comprehensive loss - net appreciation (depreciation) on available-for-sale securities	(0.1)	—	(0.5)	(0.6)	0.3	(0.3)
Purchases and sales:						
Purchases	10.0	—	—	10.0	—	10.0
Sales	(2.9)	(0.4)	(0.6)	(3.9)	—	(3.9)
Balance at end of year	$ 14.0	$ 0.1	$ 11.3	$ 25.4	$ 14.4	$ 39.8
Changes in unrealized losses for the period included in other comprehensive loss for assets held at the end of the year	$ —	$ —	$ (0.5)	$ (0.5)	$ —	$ (0.5)

During the years ended December 31, 2022 and 2021, there were no transfers between Level 2 and Level 3, and the Company held no Level 3 liabilities for the years ended December 31, 2022 and 2021.

The following table provides quantitative information about the significant unobservable inputs used by the Company in the fair value measurements of Level 3 assets. Where discounted cash flows were used in the valuation of fixed maturities, the internally-developed discount rate was adjusted by the significant unobservable inputs shown in the table.

DECEMBER 31,			2022		2021	
(in millions)	Valuation Technique	Significant Unobservable Inputs	Fair Value	Range (Wtd Average)	Fair Value	Range (Wtd Average)
Fixed maturities:						
Municipal	Discounted cash flow	Discount for:	**$ 9.3**		$ 14.0	
		Small issue size		**4.5 - 6.8% (6.6%)**		4.5 - 6.8% (6.5%)
Corporate	Discounted cash flow	Discount for:	**0.1**		0.1	
		Small issue size		**2.5% (2.5%)**		2.5% (2.5%)
		Above-market coupon		**0.3% (0.3%)**		0.3% (0.3%)
Commercial mortgage-backed	Discounted cash flow	Discount for:	**7.5**		11.3	
		Small issue size		**3.0 - 3.1% (3.0%)**		1.9 - 3.1% (2.7%)
		Above-market coupon		**0.5% (0.5%)**		0.5% (0.5%)
		Lease structure		**0.3% (0.3%)**		0.3% (0.3%)
Equity securities	Market comparables	Net tangible asset	**1.1**	**N/A**	1.3	N/A
	Internal price based on financing round	Discount for:	**6.4**		8.8	
		Market liquidity		**27.0% (27.0%)**		N/A
Other	Discounted cash flow	Discount rate	**3.6**	**17.2% (17.2%)**	4.3	16.1% (16.1%)

The weighted average of the unobservable inputs was weighted by the relative fair value of the securities to which the inputs were applied. Each unobservable input is based on the Company's subjective opinion and therefore inherently contains a degree of uncertainty. Significant changes in any of the above inputs in isolation would result in a significantly lower or higher fair value measurement. There were no interrelationships between these inputs which might magnify or mitigate the effect of changes in unobservable inputs on the fair value measurement.

5. DEBT AND CREDIT ARRANGEMENTS

Debt consists of the following:

DECEMBER 31 *(in millions)*	2022	2021
Senior debentures maturing April 15, 2026	**$ 375.0**	$ 375.0
Senior debentures maturing September 1, 2030	**300.0**	300.0
Senior debentures maturing October 15, 2025	**61.8**	61.8
Subordinated debentures maturing February 3, 2027	**50.1**	50.1
Total principal debt	**786.9**	786.9
Unamortized debt issuance costs	**(4.5)**	(5.3)
Total	**$ 782.4**	$ 781.6

The Company held $375.0 million par value of 4.5% unsecured senior debentures at December 31, 2022 and 2021, that were issued on April 8, 2016, and mature on April 15, 2026. The Company also held $300.0 million aggregate principal amount of 2.50% unsecured senior debentures, issued on August 24, 2020 and maturing September 1, 2030 at December 31, 2022 and 2021.

Additionally, the Company had outstanding 7.625% unsecured senior debentures with a par value of $61.8 million as of December 31, 2022 and 2021, maturing on October 15, 2025. All of the Company's outstanding senior debentures are subject to certain restrictive covenants, including limitations on the issuance or disposition of stock of restricted subsidiaries and limitations on liens, and pay interest semi-annually.

The Company also held subordinated debentures maturing February 3, 2027 which had a par value of $50.1 million as of December 31, 2022 and 2021, and pay cumulative dividends semi-annually at 8.207%.

Membership in FHLB provides the Company with access to additional short-term liquidity based on the level of investment in FHLB stock and pledged collateral. Total holdings of FHLB stock were $6.0 million and $2.8 million at December 31, 2022 and 2021, respectively. At December 31, 2022 and 2021, the Company had pledged government agency securities with a fair value of $132.5 million and $106.6 million, respectively, as collateral for periodic short-term borrowings with the FHLB. There were no borrowings outstanding with the FHLB at December 31, 2022 or 2021.

At December 31, 2022, the Company had a $200.0 million credit agreement which expires in April 2024. The Company had no borrowings under this agreement as of December 31, 2022.

Interest expense was $34.1 million, $34.0 million, and $37.1 million in 2022, 2021 and 2020, respectively. At December 31, 2022, the Company was in compliance with the covenants associated with all of its debt indentures and credit arrangements.

6. INCOME TAXES

Provisions for income taxes have been calculated in accordance with the provisions of ASC 740. Income from continuing operations before income taxes and a summary of the components of income tax expense in the Consolidated Statements of Income are shown below:

YEARS ENDED DECEMBER 31 *(in millions)*	2022	2021	2020
Income from continuing operations before income taxes	**$ 144.0**	$ 521.3	$ 444.8
Income tax expense (benefit):			
Current	**$ 73.7**	$ 77.5	$ 105.9
Deferred	**(46.5)**	23.8	(23.1)
Total income tax expense	**$ 27.2**	$ 101.3	$ 82.8

The income tax expense attributable to the consolidated results of continuing operations is different from the amount determined by multiplying income from continuing operations before income taxes by the U.S. statutory federal income tax rate of 21%. The sources of the difference and the tax effects of each were as follows:

YEARS ENDED DECEMBER 31	2022	2021	2020
(in millions)			
Expected income tax expense	**$ 30.3**	$ 109.5	$ 93.4
Nondeductible expenses	**3.1**	2.3	1.8
Stock-based compensation windfall benefit	**(3.2)**	(2.6)	(2.1)
Tax difference related to investment disposals and maturities	**(1.4)**	(4.6)	(9.2)
Dividend received deduction	**(1.0)**	(1.2)	(1.1)
Current year federal tax credits	**(0.4)**	(0.5)	—
Prior years' federal research tax credits	**—**	(1.7)	—
Other, net	**(0.2)**	0.1	—
Income tax expense	**$ 27.2**	$ 101.3	$ 82.8
Effective tax rate	**18.9%**	19.4%	18.6%

The following are the components of the Company's deferred tax assets and liabilities, excluding those associated with its discontinued operations.

DECEMBER 31	2022	2021
(in millions)		
Deferred tax assets:		
Loss, LAE and unearned premium reserves, net	**$ 185.6**	$ 170.0
Investments, net	**144.3**	—
Employee benefit plans	**8.4**	7.2
Other	**7.3**	11.4
Total deferred tax assets	**345.6**	188.6
Deferred tax liabilities:		
Deferred acquisition costs	**127.0**	115.9
Software capitalization	**19.4**	24.9
Investments, net	**—**	108.6
Total deferred tax liabilities	**146.4**	249.4
Net deferred tax asset (liability)	**$ 199.2**	$ (60.8)

Deferred tax assets are reduced by a valuation allowance if it is more likely than not that all or some portion of the deferred tax assets will not be realized. The Company believes it is more likely than not that the deferred tax assets will be realized; therefore there was no valuation allowance required at December 31, 2022 or 2021.

In prior years, the Company completed several transactions which resulted in, for tax purposes only, realized gains in its investment portfolio. As a result of these transactions, the Company was able to utilize capital losses carried forward and to release the valuation allowance recorded against the deferred tax asset related to these losses. The releases of these valuation allowances were recorded as a benefit in accumulated other comprehensive income. Previously unrealized benefits of $1.4 million, $4.6 million and $9.2 million, were recognized as part of income from continuing operations during 2022, 2021 and 2020, respectively. The remaining amount of $5.6 million in accumulated other comprehensive income will be released into income from continuing operations in future years, as the investment securities subject to these transactions are sold or mature.

The table below provides a reconciliation of the beginning and ending liability for uncertain tax positions as follows:

YEARS ENDED DECEMBER 31	2022	2021	2020
(in millions)			
Liability at beginning of year, net	**$ 2.0**	$ 0.9	$ 1.3
Additions for tax positions of current year	**0.2**	2.0	—
Subtractions as a result of a lapse of the applicable statute of limitations	**—**	(0.9)	(0.4)
Liability at end of year, net	**$ 2.2**	$ 2.0	$ 0.9

There were no tax positions at December 31, 2022, 2021 and 2020 for which the ultimate deductibility was highly certain, but for which there was uncertainty about the timing of such deductibility. Because of the impact of deferred tax accounting, other than interest and penalties, a change in the timing of deductions would not impact the annual effective tax rate.

The Company recognizes interest and penalties related to unrecognized tax benefits in federal income tax expense. For the years ended December 31, 2022, 2021 and 2020 the Company recognized a de minimis amount of net interest and has not recognized any penalties associated with unrecognized tax benefits. During both 2021 and 2020, the Company released accrued interest of $0.1 million due to the expiration of a statute of limitations.

The Company and its subsidiaries file income tax returns in the U.S. federal jurisdiction and various state jurisdictions, as well as foreign jurisdictions. The Company and its subsidiaries are subject to U.S. federal and state income tax examinations and foreign examinations for years after 2018. The audit of the Company's Massachusetts corporate excise tax for years 2017 and 2018 was settled in October 2022. The audit of the Company's 2019 Illinois business income tax commenced in May 2022.

7. PENSION PLANS

DEFINED BENEFIT PLANS

The Company recognizes the funded status of its defined benefit plans in its Consolidated Balance Sheets. The funded status is measured as the difference between the fair value of plan assets and the projected benefit obligation of the Company's defined benefit plans. The Company provides information for its overfunded plan separate from its underfunded plan.

Defined Benefit Plans

Prior to 2005, THG provided retirement benefits to substantially all of its employees under defined benefit pension plans. These plans were based on a defined benefit cash balance formula, whereby the Company annually provided an allocation to each covered employee based on a percentage of that employee's eligible salary, similar to a defined contribution plan arrangement. In addition to the cash balance allocation, certain employees who had met specified age and service requirements as of December 31, 1994 were eligible for a grandfathered benefit based primarily on each employee's years of service and compensation during their highest five consecutive plan years of employment. The Company's policy for the plans is to fund at least the minimum amount required by the Employee Retirement Income Security Act of 1974 ("ERISA").

As of January 1, 2005, the defined benefit pension plans were frozen, and since that date no further cash balance allocations have been credited to participants. Participants' accounts are credited with interest daily, based upon the General Agreement of Trades and Tariffs rate (the 30-year Treasury Bond interest rate). As of December 31, 2022, based on current estimates of plan liabilities and other assumptions, the assets of the qualified defined benefit pension plan exceeded the projected benefit obligation by approximately $9.8 million.

Assumptions

Defined Benefit Plans

In order to measure the expense associated with these plans, management must make various estimates and assumptions, including discount rates used to value liabilities, assumed rates of return on plan assets, employee turnover rates and anticipated mortality rates, for example. The estimates used by management are based on the Company's historical experience, as well as current facts and circumstances. In addition, the Company uses outside actuaries to assist in measuring the expense and liability associated with these plans.

The Company measures the funded status of its plans as of the date of its year-end statement of financial position. The Company utilizes a measurement date of December 31st to determine its benefit obligations, consistent with the date of its Consolidated Balance Sheets.

Weighted average assumptions used to determine pension benefit obligations are as follows:

DECEMBER 31	2022	2021	2020
Discount rate - qualified plan	**6.00%**	3.25%	3.00%
Discount rate - non-qualified plan	**6.00%**	3.25%	2.88%
Cash balance interest crediting rate	**3.00%**	3.00%	3.00%

The Company utilizes a measurement date of January 1st to determine its periodic pension costs. Weighted average assumptions used to determine net periodic pension costs for the defined benefit plans are as follows:

YEARS ENDED DECEMBER 31	2022	2021	2020
Qualified plan			
Discount rate	**3.25%**	3.00%	3.75%
Expected return on plan assets	**3.75%**	3.75%	4.75%
Cash balance interest crediting rate	**3.00%**	3.00%	3.50%
Non-qualified plan			
Discount rate	**3.25%**	2.88%	4.00%

The expected rates of return were determined using historical mean returns for each asset class, adjusted for certain factors believed to have an impact on future returns. These returns are generally weighted to the plan's actual asset allocation, and are net of administrative expenses. For the qualified defined benefit plan, the 2022 expected return on plan assets of 3.75% reflects long-term expectations and is consistent with prior year based upon long-term market expectations and expense management efforts. The Company reviews and updates, at least annually, its expected return on plan assets based on changes in the actual assets held by the plan and market conditions.

Plan Assets

Qualified Defined Benefit Plan

For the qualified defined benefit plan, a target allocation approach is utilized, which focuses on creating a mix of assets that will generate modest growth from equity securities while minimizing volatility from changes in the markets and economic environment. Various factors are taken into consideration in determining the appropriate asset mix, such as census data, actuarial valuation information and capital market assumptions. Target allocations are reviewed and updated at least annually. Changes are made periodically.

The following table provides its year-end 2022 target allocations and actual invested asset allocations at December 31, 2022 and 2021.

DECEMBER 31	2022 TARGET LEVELS	2022	2021
Fixed income securities:			
Fixed maturities	**88%**	88%	88%
Money market funds	**2%**	2%	1%
Total fixed income securities	**90%**	90%	89%
Equity securities	**10%**	10%	11%
Total plan assets	**100%**	100%	100%

The following table presents, for each hierarchy level, the qualified defined benefit plan's investment assets that are measured at fair value at December 31, 2022 and 2021. Refer to Note 4 – "Fair Value" for a description of the different levels in the Fair Value Hierarchy.

DECEMBER 31	2022				2021			
(in millions)	Total	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Level 3
Fixed income securities:								
Fixed maturities	**$ 42.7**	**$ 28.3**	**$ —**	**$ 14.4**	$ 64.5	$ 48.5	$ —	$ 16.0
Money market mutual funds	**6.5**	**6.5**	**—**	**—**	7.2	7.2	—	—
Total investments at fair value	**$ 49.2**	**$ 34.8**	**$ —**	**$ 14.4**	$ 71.7	$ 55.7	$ —	$ 16.0

Fixed Income Securities and Mutual Funds

Securities classified as Level 1 at December 31, 2022 and 2021 include actively traded mutual funds and U.S. Treasury bonds, which are valued at quoted market prices. Securities classified as Level 3 at December 31, 2022 and 2021 include assets held in a fixed account of an insurance company. The fair value of the investment is estimated using a comparable public market financial institution derived fair value curve that uses non-observable inputs for market liquidity and unique credit characteristics of its underlying securities.

The Plan also holds investments measured at fair value using NAV based on the value of the underlying investments, which is determined independently by the investment manager and have not been included in the table above. These include cash, investments in commingled pools and investment-grade fixed income securities held in a custom fund, and other commingled pools that primarily invest in publicly traded common stocks. The daily NAV, which is not published as a quoted market price for these investments, is used as the basis for transactions. Redemption of these funds is not subject to restriction. The fair values of these investments are as follows:

DECEMBER 31	2022	2021
Fixed maturities	**$ 284.7**	$ 354.0
Equity securities	**37.6**	52.3
Total investments carried at NAV	**$ 322.3**	$ 406.3

The table below provides a reconciliation for all assets measured at fair value on a recurring basis using significant unobservable inputs (Level 3).

YEARS ENDED DECEMBER 31	2022	2021
(in millions)		
Balance at beginning of period	**$ 16.0**	$ 19.1
Less: Assets transferred to Level 1 investments	**(2.0)**	(3.5)
Return on plan assets related to assets still held	**0.4**	0.4
Balance at end of year	**$ 14.4**	$ 16.0

Obligations and Funded Status

The Company recognizes the current funded status of its plans in its Consolidated Balance Sheets. Changes in the funded status of the plans are reflected as components of either net income or accumulated other comprehensive income (loss). The components of accumulated other comprehensive income (loss) are reflected as a net actuarial gain or loss.

The following table reflects the benefit obligations, fair value of plan assets and funded status of the plans at December 31, 2022 and 2021.

DECEMBER 31	Qualified Pension Plan		Non-Qualified Pension Plan	
(in millions)	2022	2021	2022	2021
Change in benefit obligation:				
Benefit obligation, beginning of period [1]	**$ 458.6**	$ 483.3	**$ 31.0**	$ 33.0
Interest cost	**14.3**	14.0	**1.0**	0.9
Actuarial gains	**(78.0)**	(5.2)	**(4.5)**	(0.1)
Benefits paid	**(33.2)**	(33.5)	**(3.0)**	(2.8)
Benefit obligation, end of year [1]	**361.7**	458.6	**24.5**	31.0
Change in plan assets:				
Fair value of plan assets, beginning of period	**478.0**	510.7	**—**	—
Actual return on plan assets	**(73.3)**	0.8	**—**	—
Contributions	**—**	—	**3.0**	2.8
Benefits paid	**(33.2)**	(33.5)	**(3.0)**	(2.8)
Fair value of plan assets, end of year	**371.5**	478.0	**—**	—
Funded status of the plans	**$ 9.8**	$ 19.4	**$ (24.5)**	$ (31.0)

(1) The accumulated benefit obligation for these plans is equal to the projected benefit obligation.

Actuarial gains related to the change in the benefit obligation for the Company's qualified benefit plan were $78.0 million for the year ended December 31, 2022, compared to $5.2 million for the year ended December 31, 2021. Actuarial gains related to the change in the benefit obligation for the Company's non-qualified benefit plan were $4.5 million for the year ended December 31, 2022, compared to $0.1 million for the year ended December 31, 2021. For both plans, the actuarial gains in 2022 and 2021 primarily reflect increases in the discount rate due to increases in corporate bond interest rates. Actuarial gains in 2021 were partially offset by less favorable mortality experience.

Components of Net Periodic Pension (Benefit) Cost

The components of total net periodic pension (benefit) cost are as follows:

YEARS ENDED DECEMBER 31	2022	2021	2020
(in millions)			
Interest cost	**$ 15.3**	$ 14.9	$ 18.3
Expected return on plan assets	**(17.2)**	(18.4)	(22.2)
Recognized net actuarial loss	**5.2**	3.2	5.8
Net periodic pension (benefit) cost	**$ 3.3**	$ (0.3)	$ 1.9

The following table reflects the total amounts recognized in accumulated other comprehensive income (loss) relating to the defined benefit pension plans as of December 31, 2022 and 2021.

DECEMBER 31	2022	2021
(in millions)		
Net actuarial loss	**$ 79.4**	$ 76.6

The unrecognized net actuarial gains or losses which exceed 10% of the greater of the projected benefit obligations or the fair value of plan assets are amortized as a component of net periodic pension cost over the next five years.

Contributions

In accordance with ERISA guidelines, the Company is not required to fund its qualified benefit plan in 2023. The Company expects to contribute $2.8 million to its non-qualified pension plan to fund 2023 benefit payments.

Benefit Payments

YEARS ENDED DECEMBER 31	2023	2024	2025	2026	2027	2028-2032
(in millions)						
Qualified pension plan	$ 37.6	$ 36.6	$ 34.9	$ 33.7	$ 33.1	$ 140.0
Non-qualified pension plan	$ 2.8	$ 2.7	$ 2.6	$ 2.5	$ 2.4	$ 10.4

The benefit payments are based on the same assumptions used to measure the Company's benefit obligations at the end of 2022. Benefit payments related to the qualified plan will be made from plan assets held in trust and not included with Company assets, whereas those payments related to the non-qualified plan will be provided for by the Company.

DEFINED CONTRIBUTION PLAN

In addition to the defined benefit plans, THG provides a qualified defined contribution 401(k) plan for all of its employees, whereby the Company matches employee elective 401(k) contributions, up to a maximum of 6% of eligible compensation in 2022, 2021 and 2020. The Company's expense for this matching provision was $26.4 million, $25.2 million and $24.1 million for 2022, 2021 and 2020, respectively. In addition to this matching provision, the Company can elect to make an annual contribution to employees' accounts.

8. OTHER COMPREHENSIVE INCOME (LOSS)

The following table provides changes in other comprehensive income (loss).

YEARS ENDED DECEMBER 31	2022			2021			2020		
(in millions)	Pre-Tax	Tax Benefit (Expense)	Net of Tax	Pre-Tax	Tax Benefit (Expense)	Net of Tax	Pre-Tax	Tax Benefit (Expense)	Net of Tax
Changes in net unrealized gains (losses) on investment securities:									
Net unrealized gains (losses) arising during period for those having no credit losses in Consolidated Statements of Income	**$(1,079.4)**	**$ 226.6**	**$(852.8)**	$(300.1)	$ 63.0	$(237.1)	$274.6	$ (57.7)	$216.9
Net unrealized gains (losses) arising during period for those having credit losses in Consolidated Statements of Income	**(10.2)**	**2.2**	**(8.0)**	(0.2)	0.1	(0.1)	1.3	(0.2)	1.1
Amount of (gains) losses realized from sales and other recognized in Consolidated Statements of Income	**26.9**	**(7.0)**	**19.9**	(3.0)	(3.9)	(6.9)	(13.5)	(6.4)	(19.9)
Amount of credit-related impairments recognized in Consolidated Statements of Income	**3.7**	**(0.8)**	**2.9**	0.2	(0.1)	0.1	1.2	(0.3)	0.9
Amount of additional impairment losses recognized in Consolidated Statements of Income	**14.8**	**(3.1)**	**11.7**	1.0	(0.2)	0.8	16.6	(3.5)	13.1
Net unrealized gains (losses)	**(1,044.2)**	**217.9**	**(826.3)**	(302.1)	58.9	(243.2)	280.2	(68.1)	212.1
Pension and postretirement benefits:									
Net gains (losses) arising in the period from net actuarial gains (losses)	**(7.2)**	**1.5**	**(5.7)**	(12.4)	2.6	(9.8)	3.9	(0.8)	3.1
Amortization of net actuarial losses recognized as net periodic benefit cost	**5.5**	**(1.2)**	**4.3**	3.4	(0.7)	2.7	6.0	(1.3)	4.7
Total pension and postretirement benefits	**(1.7)**	**0.3**	**(1.4)**	(9.0)	1.9	(7.1)	9.9	(2.1)	7.8
Other comprehensive income (loss)	**$(1,045.9)**	**$ 218.2**	**$(827.7)**	$(311.1)	$ 60.8	$(250.3)	$290.1	$ (70.2)	$219.9

Reclassifications out of accumulated other comprehensive income (loss) were as follows:

YEARS ENDED DECEMBER 31 *(in millions)*	2022	2021	2020	
Details about Accumulated Other Comprehensive Income (Loss) Components	Amount Reclassified from Accumulated Other Comprehensive Income (Loss)			Affected Line Item in the Statement Where Net Income is Presented
Net unrealized gains (losses) on investment securities	**$ (26.7)**	$ 3.0	$ 13.4	Net realized gains (losses) from sales and other
	(18.5)	(1.3)	(17.6)	Recoveries (impairments) losses on investments
	(45.2)	1.7	(4.2)	Total before tax
	10.9	4.2	10.2	Income tax benefit (expense)
	(34.3)	5.9	6.0	Continuing operations; net of tax
	(0.2)	0.1	(0.1)	Discontinued life businesses
	(34.5)	6.0	5.9	Net of tax
Amortization of defined benefit pension and postretirement actuarial losses	**(5.5)**	(3.4)	(6.0)	Loss adjustment expenses and other operating expenses [(1)]
	1.2	0.7	1.3	Income tax benefit (expense)
	(4.3)	(2.7)	(4.7)	Continuing operations; net of tax
Total reclassifications for the period	**$ (38.8)**	$ 3.3	$ 1.2	Benefit (expense) reflected in income, net of tax

(1) The amount reclassified from accumulated other comprehensive income for the pension and postretirement benefits was allocated approximately 40% to loss adjustment expenses and 60% to other operating expenses for each of the years ended December 31, 2022, 2021 and 2020.

9. STOCK-BASED COMPENSATION PLANS

On May 10, 2022 the shareholders approved The Hanover Insurance Group 2022 Long-Term Incentive Plan (the “2022 Stock Plan”). With respect to new share-based issuances, the 2022 Stock Plan replaced The Hanover Insurance Group, Inc. 2014 Long-Term Incentive Plan (the “2014 Stock Plan”) and authorized the issuance of 3,380,000 shares in a new share pool plus any shares subject to outstanding awards under the 2014 Stock Plan that may become available for reissuance as a result of the cash settlement, forfeiture, expiration or cancellation of such awards. The 2022 Stock Plan provides for the granting of the same types of awards as the 2014 Stock Plan, which includes stock options and stock appreciation rights ("SARS"), restricted and unrestricted stock, stock units, performance-based stock awards and cash awards. In accordance with the 2022 Stock Plan, the issuance of one share of common stock in the form of an option or SAR will reduce the share pool by one share, whereas the issuance of one share of common stock for the other types of stock awards provided by the plan will reduce the pool by 3.2 shares. As of December 31, 2022, there were 3,399,209 shares available for grants under the 2022 Stock Plan.

On May 20, 2014, shareholders approved The Hanover Insurance Group 2014 Employee Stock Purchase Plan (the “ESPP Plan”) authorizing the issuance of 2,500,000 shares under such plan. As of December 31, 2022, 2,295,360 shares were available for grant under the ESPP Plan.

Compensation cost for the years ended December 31, 2022, 2021 and 2020 totaled $29.0 million, $22.9 million and $20.1 million, respectively. Related tax benefits were $6.1 million, $4.8 million and $4.2 million, respectively.

STOCK OPTIONS

Under the 2022 Stock Plan, options may be granted to eligible employees, directors or consultants at an exercise price equal to the market price of the Company’s common stock on the date of grant. Option shares may be exercised subject to the terms prescribed by the Compensation and Human Capital Committee of the Board of Directors (the “Committee”) at the time of grant. Options granted in 2022, 2021 and 2020 generally vest over 3 years with 33 1/3% vesting in each year. Options must be exercised not later than ten years from the date of grant.

Information on the Company's stock options is summarized below.

YEARS ENDED DECEMBER 31	2022		2021		2020	
(in whole shares and dollars)	Shares	Weighted Average Exercise Price	Shares	Weighted Average Exercise Price	Shares	Weighted Average Exercise Price
Outstanding, beginning of year	**1,230,211**	**$ 99.14**	1,282,278	$ 93.64	1,121,559	$ 87.88
Granted	**140,339**	**139.51**	178,040	115.35	242,598	118.34
Exercised	**(279,499)**	**87.95**	(225,338)	80.24	(54,721)	75.86
Forfeited or cancelled	**(10,199)**	**121.39**	(4,769)	118.01	(27,158)	112.18
Outstanding, end of year	**1,080,852**	**$ 107.07**	1,230,211	$ 99.14	1,282,278	$ 93.64
Exercisable, end of year	**755,953**	**$ 98.82**	845,429	$ 91.10	852,804	$ 82.76

Cash received for options exercised for the years ended December 31, 2022, 2021 and 2020 was $11.1 million, $18.0 million and $3.9 million, respectively. The intrinsic value of options exercised for the years ended December 31, 2022, 2021 and 2020 was $16.0 million, $12.2 million and $2.7 million, respectively.

The excess tax benefit realized from options exercised for the years ended December 31, 2022, 2021 and 2020 was $2.4 million, $2.0 million and $0.4 million, respectively. The aggregate intrinsic value at December 31, 2022 for shares outstanding and shares exercisable was $30.9 million and $27.4 million, respectively. At December 31, 2022, the weighted average remaining contractual life for shares outstanding and shares exercisable was 6.1 years and 5.1 years, respectively. Additional information about employee options outstanding and exercisable at December 31, 2022 is included in the following table:

	Options Outstanding			Options Currently Exercisable	
Range of Exercise Prices	Number	Weighted Average Remaining Contractual Lives	Weighted Average Exercise Price	Number	Weighted Average Exercise Price
$40.01 to $54.61	46,825	1.00	$ 52.63	46,825	$ 52.63
$66.14 to $66.26	68,310	2.16	66.14	68,310	66.14
$74.30 to $77.91	60,103	3.14	77.83	60,103	77.83
$82.39 to $92.68	94,777	4.26	85.19	94,146	85.14
$104.11 to $113.32	161,707	5.17	104.30	161,707	104.30
$115.35 to $117.22	300,803	7.27	116.20	187,886	116.70
$118.54 to $139.51	348,327	7.96	126.80	136,976	118.54

The fair value of each option is estimated on the date of grant using the Black-Scholes option pricing model. For all options granted through December 31, 2022, the exercise price equaled the market price on the grant date. Compensation cost related to options is based upon the grant date fair value and expensed on a straight-line basis over the service period for each separately vesting portion of the option as if the option was, in substance, multiple awards.

The weighted average grant date fair value of options granted during the years ended December 31, 2022, 2021 and 2020 was $28.54, $20.96 and $14.45, respectively.

The following significant assumptions were used to determine the fair value for options granted in the years indicated.

	2022	2021	2020
Dividend yield	**2.150 %**	2.427 %	2.193% to 2.805%
Expected volatility	**24.254% to 32.174 %**	24.115% to 31.315 %	17.671% to 24.495%
Weighted average expected volatility	**28.08 %**	27.45 %	18.10%
Risk-free interest rate	**1.562% to 1.803 %**	0.194% to 1.046 %	0.262% to 1.042%
Expected term, in years	**2.5 to 7.0**	2.5 to 6.5	2.5 to 6.5

The expected dividend yield is based on the Company's dividend payout rate(s), in the year noted. Expected volatility is based generally on the Company's historical daily stock price volatility. The risk-free rate for periods within the contractual life of the option is based on the U.S. Treasury yield curve in effect at the time of grant. The expected term of options granted represents the period of time that options are expected to be outstanding and is derived primarily using historical exercise, forfeit and cancellation behavior, along with certain other factors expected to differ from historical data.

The fair value of shares that vested during the years ended December 31, 2022 and 2021 was $4.5 million and $1.0 million, respectively. As of December 31, 2022, the Company had unrecognized compensation expense of $2.3 million related to unvested stock options that is expected to be recognized over a weighted average period of 1.3 years.

RESTRICTED STOCK UNITS

Stock grants may be awarded to eligible employees at a price established by the Committee (which may be zero). Under the 2022 Stock Plan, the Company may award shares of restricted stock, restricted stock units, as well as shares of unrestricted stock. Restricted stock grants may vest based upon performance criteria, market criteria or continued employment and be in the form of shares or units. Vesting periods are established by the Committee.

The Company granted both market-based and performance-based restricted share units in 2022, 2021 and 2020. These units generally vest after three years of continued employment and after the achievement of certain performance targets. The Company also granted time-based restricted stock units to eligible employees in 2022, 2021 and 2020 that generally vest after three years of continued employment.

The following table summarizes information about employee restricted stock units:

YEARS ENDED DECEMBER 31	2022		2021		2020	
	Shares	Weighted Average Grant Date Fair Value	Shares	Weighted Average Grant Date Fair Value	Shares	Weighted Average Grant Date Fair Value
Time-based restricted stock units:						
Outstanding, beginning of year	**380,100**	**$ 117.60**	350,480	$ 116.37	335,166	$ 109.55
Granted	**151,193**	**138.52**	173,963	115.69	143,128	117.72
Vested	**(123,158)**	**119.48**	(119,645)	111.30	(94,993)	94.54
Forfeited	**(29,879)**	**123.60**	(24,698)	117.17	(32,821)	115.74
Outstanding, end of year	**378,256**	**$ 124.88**	380,100	$ 117.60	350,480	$ 116.37
Performance and market-based restricted stock units:						
Outstanding, beginning of year	**113,848**	**$ 115.92**	97,043	$ 119.59	86,252	$ 110.70
Granted	**47,954**	**140.36**	62,143	114.66	54,415	105.10
Vested	**(39,338)**	**122.42**	(43,506)	122.27	(40,601)	80.92
Forfeited	**(3,301)**	**120.66**	(1,832)	116.90	(3,023)	124.78
Outstanding, end of year	**119,163**	**$ 122.81**	113,848	$ 115.92	97,043	$ 119.59

In 2022, 2021 and 2020, the Company granted market-based awards totaling 19,057, 37,848, and 21,379, respectively, to certain members of senior management, which are included in the table above as performance and market-based restricted stock activity. The vesting of these stock units is based on the relative total shareholder return ("TSR") of the Company. This metric is generally based on relative TSR for a three-year period as compared to a group of Property and Casualty peer companies. The fair value of market-based awards was estimated at the date of grant using a valuation model. These units have the potential to range from 0% to 150% of the shares disclosed.

In 2022, 2021 and 2020, the Company also granted performance-based restricted stock units totaling 28,897, 21,401 and 19,504, respectively to certain members of senior management, which are included in the table above as performance and market-based restricted stock activity. The vesting of these stock units is determined through the use of a performance-based metric (return on equity) and has the potential to range from 0% to 150% of the shares disclosed. Increases above the 100% target level are reflected as granted in the period after which performance-based stock unit goals are achieved. Decreases below the 100% target level are reflected as forfeited.

In 2022, included in the amounts granted above are 7,988 shares related to 2019 performance-based awards that achieved a payout in excess of 100%. The weighted average grant date fair value of these awards was $119.36. In 2021, 14,501 market-based restricted stock units were included as granted due to completion levels in excess of 100% for units granted in 2018. The weighted average grant date fair value of these awards was $122.27. In 2020, 13,532 market-based restricted stock units were included as granted due to completion levels in excess of 100% for units granted in 2017. The weighted average grant date fair value of these awards was $80.92.

Included in 2022 are 1,282 market-based restricted stock units which were included as forfeited due to completion levels less than 100% for units granted in 2019. The weighted average grant date fair value of these awards was $133.44. During 2022, 2021 and 2020, there were 1,043 shares, 932 shares, and 1,949 shares, respectively, of market-based awards that forfeited. Also, during 2022, 2021 and 2020 there were 976 shares, 900 shares, and 1,074 shares, respectively, of performance-based awards that forfeited.

The increase in fair value from grant date of restricted stock and restricted stock units that vested during the years ended December 31, 2022, 2021 and 2020 was $2.5 million, $1.2 million and $4.5 million, respectively. The increase in the fair value from grant date for performance and market-based restricted stock units that vested in 2022 and 2020 were $0.6 million and $2.0 million, respectively; however, for 2021 there was no increase in fair value from grant date.

At December 31, 2022, the fair value of outstanding restricted stock units was $47.2 million and the weighted average remaining contractual life was 1.2 years. The fair value of outstanding performance and market-based restricted stock units was $14.6 million and

the weighted average remaining contractual life was 1.1 years. As of December 31, 2022, there was $24.1 million of total unrecognized compensation cost related to unvested restricted stock units and performance and market-based restricted stock units. The cost is expected to be recognized over a weighted average period of 1.7 years. Compensation cost associated with restricted stock, restricted stock units and performance and market-based restricted stock units is generally calculated based upon grant date fair value, which is determined using current market prices.

10. EARNINGS PER SHARE AND SHAREHOLDERS' EQUITY TRANSACTIONS

The following table provides weighted average share information used in the calculation of the Company's basic and diluted earnings per share:

DECEMBER 31	2022	2021	2020
(in millions, except per share data)			
Basic shares used in the calculation of earnings per share	**35.6**	35.9	37.7
Dilutive effect of securities:			
Employee stock options	**0.2**	0.3	0.2
Non-vested stock grants	**0.3**	0.2	0.2
Diluted shares used in the calculation of earnings per share	**36.1**	36.4	38.1
Per share effect of dilutive securities on income from continuing operations	**$ (0.05)**	$ (0.18)	$ (0.11)
Per share effect of dilutive securities on net income	**$ (0.05)**	$ (0.18)	$ (0.10)

Diluted earnings per share during 2022, 2021 and 2020 excludes 0.1 million, 0.2 million and 0.4 million, respectively, of common shares issuable under the Company's stock compensation plans, because their effect would be antidilutive.

The Board of Directors authorized a stock repurchase program which provides for aggregate repurchases of the Company's common stock of up to $1.3 billion. Under this program the Company had approximately $330 million available at December 31, 2022. Under the repurchase authorization, the Company may repurchase, from time to time, common stock in amounts, at prices and at such times as the Company deems appropriate, subject to market conditions and other considerations. Repurchases may be executed using open market purchases, privately negotiated transactions, accelerated repurchase programs or other transactions. The Company is not required to purchase any specific number of shares or to make purchases by any certain date under this program. During 2020, pursuant to the terms of an accelerated share repurchase agreement, the Company paid $100.0 million and received 0.9 million shares of its common stock. The Company also repurchased approximately 0.2 million, 1.2 million and 1.1 million shares through open market purchases during 2022, 2021 and 2020, respectively.

11. DIVIDEND RESTRICTIONS

The individual law of all states, including New Hampshire and Michigan, where Hanover Insurance and Citizens are domiciled, respectively, restrict the payment of dividends to stockholders by insurers. These laws affect the dividend paying ability of Hanover Insurance and Citizens.

Pursuant to New Hampshire's statute, the maximum dividends and other distributions that an insurer may pay in any twelve-month period, without prior approval of the New Hampshire Insurance Commissioner, is limited to the lesser of 10% of such insurer's statutory policyholder surplus as of the preceding December 31, or statutory net income less net realized gains. Hanover Insurance declared and paid dividends to its parent totaling $100.0 million in 2022, $255.0 million in 2021 and $245.0 million in 2020. At January 1, 2023, the maximum dividend payable without prior approval was $168.3 million. In May 2023, the maximum dividend declared payable without prior approval will increase by $100.0 million to a total amount of $268.3 million.

Pursuant to Michigan's statute, the maximum dividends and other distributions that an insurer may pay in any twelve-month period, without prior approval of the Michigan Insurance Commissioner, is limited to the greater of 10% of policyholders' surplus as of December 31 of the immediately preceding year or the statutory net income less net realized gains, for the immediately preceding calendar year. Citizens declared and paid ordinary dividends to its parent, Hanover Insurance, totaling $72.0 million and $90.0 million in 2022 and 2021, respectively. In 2020, an extraordinary dividend of $82.0 million was declared and paid by Citizens. Accordingly, Citizens cannot declare a further dividend without prior approval until November 2023, at which time the maximum dividend declared payable without prior approval will be $68.9 million.

The statutes in both New Hampshire and Michigan require that prior notice to the respective Insurance Commissioner of any proposed dividend be provided and such Commissioner may, in certain circumstances, prohibit the payment of the proposed dividend.

12. SEGMENT INFORMATION

The Company's primary business operations include insurance products and services provided through four operating segments: Core Commercial, Specialty, Personal Lines and Other. Core Commercial includes commercial multiple peril, commercial automobile, workers' compensation, and other commercial coverages provided to small and mid-sized businesses. Specialty includes four divisions of business: Professional and Executive Lines, Specialty Property and Casualty ("Specialty P&C"), Marine, and Surety and Other. Specialty P&C includes coverages such as program business, which provides commercial insurance to markets with specialized coverage or risk management needs related to groups of similar businesses, specialty industrial and commercial property, excess and surplus lines and specialty general liability coverage. Personal Lines includes personal automobile, homeowners and other personal coverages. Included in the Other segment are Opus Investment Management, Inc., which markets investment management services to institutions, pension funds and other organizations; earnings on holding company assets; holding company and other expenses, including certain costs associated with retirement benefits due to the Company's former life insurance employees and agents; and run-off voluntary assumed property and casualty pools and run-off direct asbestos and environmental businesses. During the first quarter of 2022, the Company disaggregated its former Commercial Lines segment into Core Commercial and Specialty segments. Prior periods reflect this new presentation. This presentation is consistent with the way results are regularly evaluated by the chief operating decision maker in deciding how to allocate resources and in assessing performance.

The Company reports interest expense related to debt separately from the earnings of its operating segments. For 2022, this consisted of interest on the Company's senior and subordinated debentures.

Management evaluates the results of its segments based on operating income before income taxes, excluding interest expense on debt. Operating income before income taxes excludes certain items which are included in net income, such as net realized and unrealized investment gains and losses. Such gains and losses are excluded since they are determined by interest rates, financial markets and the timing of sales. Also, operating income before income taxes excludes net gains and losses on disposals of businesses, gains and losses related to the repayment of debt, discontinued operations, costs to acquire businesses, restructuring costs, the cumulative effect of accounting changes and certain other items. Although the items excluded from operating income before interest expense and income taxes may be important components in understanding and assessing the Company's overall financial performance, management believes that the presentation of operating income before interest expense and income taxes enhances an investor's understanding of the Company's results of operations by highlighting net income attributable to the core operations of the business. However, operating income before income taxes should not be construed as a substitute for income before income taxes or income from continuing operations and operating income should not be construed as a substitute for net income.

Summarized below is financial information with respect to the Company's business segments.

YEARS ENDED DECEMBER 31 *(in millions)*	2022	2021	2020
Operating revenues:			
Core Commercial	**$ 2,090.7**	$ 1,960.7	$ 1,832.2
Specialty	**1,256.5**	1,099.2	1,036.1
Personal Lines	**2,213.7**	2,028.5	1,931.4
Other	**14.2**	16.4	20.1
Total	**5,575.1**	5,104.8	4,819.8
Net realized and unrealized investment gains (losses)	**(106.5)**	123.0	5.0
Total revenues	**$ 5,468.6**	$ 5,227.8	$ 4,824.8
Operating income (loss) before interest expense and income taxes:			
Core Commercial:			
Underwriting income (loss)	**$ (28.7)**	$ (7.5)	$ 57.5
Net investment income	**136.2**	146.5	124.2
Other expense	**(0.6)**	(1.0)	(3.6)
Core Commercial operating income	**106.9**	138.0	178.1
Specialty:			
Underwriting income	**124.7**	69.4	48.8
Net investment income	**62.1**	62.9	51.1
Other expense	**(0.8)**	(0.4)	(2.6)
Specialty operating income	**186.0**	131.9	97.3
Personal Lines:			
Underwriting income (loss)	**(104.2)**	65.1	132.9
Net investment income	**86.8**	89.4	76.7
Other income	**8.6**	4.0	2.9
Personal Lines operating income (loss)	**(8.8)**	158.5	212.5
Other:			
Underwriting loss	**(1.2)**	(1.0)	(4.3)
Net investment income	**11.2**	11.9	13.1
Other expense	**(9.0)**	(7.0)	(12.0)
Other operating income (loss)	**1.0**	3.9	(3.2)
Operating income before interest expense and income taxes	**285.1**	432.3	484.7
Interest on debt	**(34.1)**	(34.0)	(37.1)
Operating income before income taxes	**251.0**	398.3	447.6
Non-operating income (loss) items:			
Net realized and unrealized investment gains (losses)	**(106.5)**	123.0	5.0
Net loss from repayment of debt	**—**	—	(6.2)
Other non-operating items	**(0.5)**	—	(1.6)
Income from continuing operations before income taxes	**$ 144.0**	$ 521.3	$ 444.8

The following table provides identifiable assets for the Company's business segments and discontinued operations:

DECEMBER 31 *(in millions)*	2022	2021
	Identifiable Assets	
Property and Casualty	**$ 13,911.0**	$ 14,147.2
Assets of discontinued businesses	**86.2**	107.1
Total	**$ 13,997.2**	$ 14,254.3

The Company reviews the assets of its insurance subsidiaries collectively and does not allocate them among the Core Commercial, Specialty, Personal Lines and Other segments.

Discontinued accident and health and life businesses

During 1999, the Company exited its accident and health insurance business, consisting of its Employee Benefit Services business, its Affinity Group Underwriters business and its accident and health assumed reinsurance pool business. Prior to 1999, these businesses comprised substantially all of the former Corporate Risk Management Services segment. On January 2, 2009, Hanover Insurance directly assumed a portion of the accident and health business and the remainder of the discontinued First Allmerica Financial Life Insurance Company ("FAFLIC") accident and health business was reinsured by Hanover Insurance in connection with the sale of FAFLIC to Commonwealth Annuity.

At December 31, 2022 and 2021, the portion of the discontinued accident and health business that was directly assumed had assets of $84.3 million and $87.7 million, respectively, consisting primarily of invested assets, and liabilities of $91.1 million and $92.3 million, respectively, consisting primarily of policy liabilities. At December 31, 2022 and 2021, the assets and liabilities of this business, as well as those of the reinsured portion of the accident and health business are classified as assets and liabilities of discontinued operations in the Consolidated Balance Sheets.

Discontinued accident and health and life operations for the years ended December 31, 2022, 2021 and 2020, resulted in losses, net of taxes, of $0.8 million, $2.5 million and $3.7 million, respectively. For the years ended December 31, 2022, 2021 and 2020, income tax benefits related to this business were $0.2 million, $0.7 million and $1.7 million, respectively.

13. REINSURANCE

In the normal course of business, the Company seeks to reduce the losses that may arise from catastrophes or other events that cause unfavorable underwriting results by reinsuring certain levels of risk in various areas of exposure with other insurance enterprises or reinsurers. Reinsurance transactions are accounted for in accordance with the provisions of ASC 944.

Amounts recoverable from reinsurers are estimated in a manner consistent with the claim liability associated with the reinsured policy. Reinsurance contracts do not relieve the Company from its obligations to policyholders. Failure of reinsurers to honor their obligations could result in losses to the Company; consequently, allowances are established for amounts deemed uncollectible. The Company determines the appropriate amount of reinsurance based on evaluations of the risks accepted and analyses prepared by consultants, and on market conditions (including the availability and pricing of reinsurance). The Company also believes that the terms of its reinsurance contracts are consistent with industry practice in that they contain standard terms with respect to lines of business covered, limits and retention, arbitration and occurrence. The Company believes that its reinsurers are financially sound, based upon an ongoing review of financial strength ratings assigned to them by rating agencies, their reputations in the reinsurance marketplace, collections history, advice from third parties, and the analysis and guidance of the Company's reinsurance advisors.

As a condition to conduct certain business in various states, the Company is required to participate in residual market mechanisms, facilities, and pooling arrangements such as the Michigan Catastrophic Claims Association ("MCCA"). The Company is subject to concentration of risk with respect to reinsurance ceded to the MCCA. Funding for MCCA comes from assessments against automobile insurers based upon their share of insured automobiles in the state for which the policyholders have elected unlimited personal injury protection ("PIP") benefits. Insurers are allowed to pass along this cost to Michigan automobile policyholders that have elected unlimited PIP benefits.

In 2021, the MCCA Board voted unanimously to return approximately $3.0 billion of its estimated surplus to policyholders through its member insurance companies. Since policyholders are the ultimate payers of the MCCA premium, this return of MCCA surplus was passed through to policyholders. The refund was paid to policyholders and was recorded as a refund of premium transaction in the Company's financial statements, reducing both direct written premium and ceded written premium. There was no effect on net written premium or net earned premium. The total amount of the refund was approximately $183.2 million, comprised of $179.1 million for personal automobile and $4.1 million for commercial automobile policyholders. Direct and ceded premium numbers in the table below reflect this refund.

Additionally, in 2019, Michigan enacted major reforms to its prior system governing personal and commercial automobile insurance. Among other things, the reform legislation set forth cost saving measures for PIP claims, including MCCA-reinsured claims, that took effect in July 2021. The Company's current estimate of MCCA reinsurance receivables was reduced for these potential future claim cost savings. This resulted in a $122.9 million decrease in MCCA reinsurance recoverables during 2021, and a corresponding decrease in MCCA ceded losses incurred. This estimate of MCCA reinsurance receivables is subject to change and will be revised further as the actual impacts of these cost saving measures emerge, if at all, in the future

The Company ceded to the MCCA premiums earned and losses and LAE incurred of $34.6 million and $32.6 million, respectively, in 2022. Including the refund of $183.2 million, during 2021 the Company's MCCA net impact was to reduce both direct premiums earned and premiums ceded by $143.7 million. Including the decrease in the Company's estimated MCCA reinsurance recoverables of $122.9 million, during 2021 the Company's MCCA net impact was to reduce ceded incurred losses and LAE by $68.0 million. The Company ceded to the MCCA premiums earned and losses and LAE incurred of $84.6 million and $99.2 million, respectively, in 2020.

The MCCA represented 44.9% of the total reinsurance receivable balance at December 31, 2022. Reinsurance recoverables related to the MCCA were $883.0 million and $901.8 million at December 31, 2022 and 2021, respectively. Since the MCCA is supported by assessments permitted by statute, and there have been no significant uncollectible balances from the MCCA identified during the three years ending December 31, 2022, the Company believes it has no significant exposure to uncollectible reinsurance balances from this entity.

The following table provides the effects of reinsurance.

YEARS ENDED DECEMBER 31	2022	2021	2020
(in millions)			
Premiums written:[1]			
Direct	**$ 6,024.4**	$ 5,310.7	$ 5,131.4
Assumed	**56.4**	33.6	23.1
Ceded	**(604.3)**	(350.9)	(556.0)
Net premiums written	**$ 5,476.5**	$ 4,993.4	$ 4,598.5
Premiums earned:[1]			
Direct	**$ 5,817.6**	$ 5,131.3	$ 5,063.8
Assumed	**47.6**	27.7	24.6
Ceded	**(612.9)**	(388.8)	(561.0)
Net premiums earned	**$ 5,252.3**	$ 4,770.2	$ 4,527.4
Percentage of assumed to net premiums earned	**0.9 %**	0.6 %	0.5 %
Losses and LAE:			
Direct	**$ 3,940.8**	$ 3,407.1	$ 3,200.5
Assumed	**44.2**	17.7	15.9
Ceded[2]	**(361.6)**	(290.6)	(371.2)
Net losses and LAE	**$ 3,623.4**	$ 3,134.2	$ 2,845.2

(1) Direct and ceded premiums written and earned in 2021 were reduced by the $183.2 million MCCA refund of premium, as discussed above.
(2) The ceded losses and LAE in 2021 declined compared to 2020 primarily due to the decrease in MCCA incurred losses that resulted from Michigan automobile reform, as discussed above.

14. LIABILITIES FOR OUTSTANDING CLAIMS, LOSSES AND LOSS ADJUSTMENT EXPENSES

Reserving Process Overview

Management's process for establishing loss reserves is a comprehensive process that involves input from multiple functions throughout the organization, including actuarial, finance, claims, legal, underwriting, distribution and business operations management. A review of loss reserves for each of the classes of business that the Company writes is conducted regularly, generally quarterly. This review process takes into consideration a variety of trends that impact the ultimate settlement of claims. Where appropriate, the loss reserving process includes a review of overall payment patterns and the emergence of paid and reported losses relative to expectations.

The loss reserve estimation process relies on the basic assumption that past experience, adjusted for the effects of current developments and likely trends, is an appropriate basis for predicting future outcomes. As part of this process, the Company uses a variety of analytical methods that consider experience, trends and other relevant factors. IBNR reserves are generally calculated by first projecting the ultimate cost of all claims that have been reported or expected to be reported in the future and then subtracting reported losses and LAE. IBNR reserves include both incurred-but-not-reported liabilities plus expected development on reported claims included in the liability for unpaid claims and claim adjustment expenses. Reported losses include cumulative paid losses and LAE plus outstanding case reserves. The Company's ultimate IBNR reserves are estimated by management and reserving actuaries on an aggregate basis for each line of business or coverage for loss and LAE liabilities not reflected within the case reserves. Case reserves are established by claim personnel individually on a claim by claim basis and based on information specific to the occurrence and terms of the underlying policy. Case reserves are periodically reviewed and modified based on new or additional information pertaining to the claim.

For events designated as catastrophes, the Company generally calculates IBNR reserves directly as a result of an estimated IBNR claim count and an estimated average claim amount for each event. Such an assessment involves a comprehensive analysis of the nature of the event, of policyholder exposures within the affected geographic area and of available claims intelligence.

Carried reserves for each line of business and coverage are determined based on the quarterly loss reserving process. In making the determination, the Company considers numerous quantitative and qualitative factors. Quantitative factors include changes in reserve estimates in the period, the maturity of the accident year, trends observed over the recent past, the level of volatility within a particular class of business, the estimated effects of reinsurance, including reinstatement premiums, general economic trends such as inflation, and other factors. Qualitative factors may include legal and regulatory developments, changes in claim handling and case reserving practices, recent entry into new markets or products, changes in underwriting practices or business mix, concerns that the Company does not have sufficient or quality historical reported and paid loss and LAE information with respect to a particular line of business and coverage, effects of the economy and political outlook, perceived anomalies in the historical results, evolving trends or other factors. Additionally, persistent supply chain disruptions emerging from the Pandemic and significant inflation in the U.S. economy, along with other factors outside the Company's control, such as those related to the Pandemic, including, among others, evolving driving patterns and court caseload backlogs.

Reserve Rollforward and Prior Year Development

The Company regularly updates its reserve estimates as new information becomes available and further events occur which may impact the resolution of unsettled claims. Reserve adjustments are reflected in results of operations as adjustments to losses and LAE. Often these adjustments are recognized in periods subsequent to the period in which the underlying policy was written and loss event occurred. These types of subsequent adjustments are described as loss and LAE "development." Such development can be either favorable or unfavorable to the Company's financial results and may vary by line of business. In this section, all amounts presented include catastrophe losses and LAE. Catastrophe losses were $402.6 million in both 2022 and 2021 and were $286.7 million in 2020. Included in 2022 were $165.0 million of catastrophe losses related to Winter Storm Elliott, which occurred in the fourth quarter.

The table below provides a reconciliation of the gross beginning and ending reserve for unpaid losses and loss adjustment expenses.

YEARS ENDED DECEMBER 31	2022	2021	2020
(in millions)			
Gross reserve for losses and LAE, beginning of year	**$ 6,447.6**	$ 6,024.0	$ 5,654.4
Reinsurance recoverable on unpaid losses	**1,693.8**	1,641.6	1,574.8
Net loss and LAE reserves, beginning of year	**4,753.8**	4,382.4	4,079.6
Net incurred losses and LAE in respect of losses occurring in:			
Current year	**3,656.0**	3,205.3	2,877.8
Prior years	**(32.6)**	(71.1)	(32.6)
Total incurred losses and LAE	**3,623.4**	3,134.2	2,845.2
Net payments of losses and LAE in respect of losses occurring in:			
Current year	**1,578.9**	1,464.1	1,347.7
Prior years	**1,534.3**	1,298.7	1,194.7
Total payments	**3,113.2**	2,762.8	2,542.4
Net reserve for losses and LAE, end of year	**5,264.0**	4,753.8	4,382.4
Reinsurance recoverable on unpaid losses	**1,748.6**	1,693.8	1,641.6
Gross reserve for losses and LAE, end of year	**$ 7,012.6**	$ 6,447.6	$ 6,024.0

The following table provides a summary of (favorable) unfavorable loss and LAE reserve development.

YEARS ENDED DECEMBER 31	2022	2021	2020
(in millions)			
Core Commercial	**$ (27.6)**	$ (27.5)	$ (27.3)
Specialty	**(28.2)**	(18.5)	(10.5)
Personal Lines	**22.0**	(26.1)	1.0
Other	**1.2**	1.0	4.2
Total loss and LAE reserve development, including catastrophes	**$ (32.6)**	$ (71.1)	$ (32.6)

As a result of continuing trends in the Company's business, reserves, including catastrophes, have been re-estimated for all prior accident years and were decreased by $32.6 million, $71.1 million and $32.6 million in 2022, 2021 and 2020, respectively.

2022

In 2022, net favorable loss and LAE development was $32.6 million, primarily as a result of net favorable development of $28.2 million in Specialty and net favorable development of $27.6 million in Core Commercial, partially offset by net unfavorable development of $22.0 million in Personal Lines. The favorable development in Specialty was primarily due to lower than expected losses of $26.3 million within the Professional and Executive division, lower than expected losses of $14.5 million in the surety line, and lower than expected losses of $10.9 million in the Marine division, partially offset by higher than expected losses of $23.5 million in the Specialty P&C division. Within Specialty P&C, higher than expected losses of $31.0 million in program business were partially offset by lower than expected losses in the specialty industrial line. The favorable development in Core Commercial was primarily due to lower than expected losses of $32.1 million within the workers' compensation line in accident years 2013 through 2018 and 2020, and lower than expected losses of $16.4 million within the commercial multiple peril line, driven by favorable catastrophe loss development, partially offset by higher than expected losses of $18.0 million in the commercial automobile line, driven by higher bodily injury and personal injury protection losses in accident years 2016, 2018, 2019 and 2021. Core Commercial favorable catastrophe loss development within the commercial multiple peril line includes lower than expected losses related to certain 2021 events including winter storms, hurricane Ida, tornadoes, and other storms. The unfavorable development in Personal Lines was primarily due to higher than expected losses of $29.3 million in the homeowners line, primarily in accident year 2021. The net unfavorable development within homeowners was driven by higher than expected catastrophe losses related to certain 2021 events including Michigan hail storms and other wind storms, partially

offset by lower than expected losses related to 2021 hurricane Ida, and higher than expected non-catastrophe losses due to higher severity and longer cycle times in repair activity, primarily related to claims incurred in the fourth quarter of 2021.

2021

In 2021, net favorable loss and LAE development was $71.1 million, primarily as a result of net favorable development of $27.5 million, $26.1 million and $18.5 million in the Core Commercial, Personal Lines and Specialty segments, respectively. The favorable development in Core Commercial was primarily due to lower than expected losses of $22.3 million within the workers' compensation line in accident years 2014 through 2020, and lower than expected losses of $12.3 million within the commercial multiple peril line. Core Commercial favorable development within the commercial multiple peril line includes lower than expected losses related to 2020 hurricanes and civil unrest and, to a lesser extent, lower than expected losses related to certain 2017 through 2019 tornadoes and hurricanes. The favorable development in Personal Lines was primarily due to lower than expected losses of $24.8 million in the personal automobile line, driven by lower bodily injury and personal injury protection losses, primarily in accident year 2020. The favorable development in Specialty was primarily due to lower than expected losses of $14.4 million in the marine line in accident years 2019 and 2020, and lower than expected losses of $10.0 million in the surety line, primarily in accident years 2013 through 2016, 2018 and 2019, partially offset by higher than expected losses of $12.0 million in the Specialty P&C division primarily due to higher than expected losses in general liability lines.

2020

In 2020, net favorable loss and LAE development was $32.6 million, primarily as a result of net favorable development of $27.3 million in Core Commercial and net favorable development of $10.5 million in Specialty, partially offset by unfavorable development in the Other Segment. The favorable development in Core Commercial was primarily due to lower than expected losses of $34.9 million within the workers' compensation line in accident years 2016 through 2019, partially offset by higher than expected losses of $15.6 million in the commercial automobile line, driven by higher bodily injury and personal injury protection losses, primarily in accident years 2017 through 2019. In addition, the Core Commercial favorable development includes lower than expected losses related to certain 2019 tornadoes, tropical storms, and winter storms and, to a lesser extent, lower than expected losses related to the 2017 and 2018 California wildfires, winter and other storms, and certain hurricanes. The favorable development in Specialty was primarily due to lower than expected losses of $20.6 million in the marine line, in accident years 2017 through 2019, partially offset by higher than expected losses of $10.1 million in the Professional and Executive lines. The unfavorable development in the Other Segment was due to the Company's run-off voluntary assumed property and casualty reinsurance pools business primarily based on an updated third-party actuarial study received during 2020 for the Excess and Casualty Reinsurance Association pool that primarily consists of asbestos and environmental exposures.

Carried Reserves

The table below summarizes the gross, ceded and net reserve for losses and LAE and reconciles to the incurred claims development in the following section. Within the Core Commercial segment, commercial multiple peril includes small commercial umbrella policies sold as an endorsement, and general liability and umbrella - occurrence which includes workers' compensation excess coverages.

YEARS ENDED DECEMBER 31	2022			2021		
(in millions)	Gross	Ceded	Net	Gross	Ceded	Net
Commercial multiple peril	**$ 1,609.1**	**$ (185.2)**	**$ 1,423.9**	$ 1,378.5	$ (153.2)	$ 1,225.3
Workers' compensation	**719.1**	**(125.2)**	**593.9**	681.2	(113.9)	567.3
Commercial automobile liability	**469.7**	**(21.8)**	**447.9**	467.0	(23.1)	443.9
General liability and umbrella - occurrence	**418.7**	**(121.8)**	**296.9**	363.7	(89.5)	274.2
Other core commercial	**134.3**	**(54.2)**	**80.1**	100.6	(29.6)	71.0
Total Core Commercial	**3,350.9**	**(508.2)**	**2,842.7**	2,991.0	(409.3)	2,581.7
Specialty property & casualty	**820.6**	**(278.8)**	**541.8**	798.6	(287.5)	511.1
General liability - claims made	**381.1**	**(18.7)**	**362.4**	345.9	(18.6)	327.3
Other specialty	**396.4**	**(66.5)**	**329.9**	377.5	(82.7)	294.8
Total Specialty	**1,598.1**	**(364.0)**	**1,234.1**	1,522.0	(388.8)	1,133.2
Personal automobile liability	**1,566.7**	**(820.6)**	**746.1**	1,560.0	(838.4)	721.6
Homeowners	**312.3**	**(2.8)**	**309.5**	238.5	(4.0)	234.5
Other personal	**119.1**	**(1.6)**	**117.5**	69.9	(1.2)	68.7
Total Personal Lines	**1,998.1**	**(825.0)**	**1,173.1**	1,868.4	(843.6)	1,024.8
Total Other	**65.5**	**(51.4)**	**14.1**	66.2	(52.1)	14.1
Total loss and LAE reserves	**$ 7,012.6**	**$ (1,748.6)**	**$ 5,264.0**	$ 6,447.6	$ (1,693.8)	$ 4,753.8

Core Commercial - general liability and umbrella - occurrence is primarily comprised of the Company's commercial monoline general liability and umbrella coverages. Other core commercial lines is primarily comprised of commercial property and product liability coverages. Specialty general liability - claims made is comprised of claims made coverages within the Professional and Executive lines primarily comprised of professional and management liability lines. Other specialty lines is primarily comprised of marine, surety, healthcare, and fidelity lines. Total Other is comprised of the Company's run-off voluntary assumed property and casualty reinsurance pools business and run-off direct asbestos and environmental business, which includes $57.1 million and $57.3 million of gross asbestos and environmental reserves as of December 31, 2022 and 2021, respectively.

Incurred claims development tables

For the following net reserve components, Core Commercial - commercial multiple peril, Core Commercial - workers' compensation, Core Commercial - commercial automobile liability, Core Commercial - general liability and umbrella - occurrence, Specialty property & casualty, Specialty general liability - claims made, personal automobile liability and homeowners, the Company is presenting incurred claims development tables by accident year. In each of these tables, the Company is presenting the number of years for which claims are typically outstanding, which is consistent with the period at which substantially all of the reserve development has emerged based on past history. The tables presented below include cumulative incurred loss and allocated loss adjustment expenses ("ALAE"), cumulative paid loss and ALAE and IBNR balances at December 31, 2022. IBNR includes both incurred but not reported liabilities and expected development on reported claims. In addition, cumulative incurred claim counts are presented as of December 31, 2022 and claim duration is presented in a separate table disclosing the average annual percentage payout of incurred claims by age, net of reinsurance. Claim duration is calculated as an average of paid loss and ALAE divided by incurred loss and ALAE by elapsed year. The incurred claims development tables presented are reconciled to the net carried reserves in the preceding table as of December 31, 2022.

Incurred claim count information presented represents claim frequency by individual claimant and measures the frequency of direct claim settlements that have resulted in or are expected to result in claim payments. Claim count information is presented in a manner consistent with that used in the quarterly loss reserving process. A single claim event, particularly in automobile lines, may result in multiple individual claimants and, therefore, multiple claim counts. Incurred claim counts are comprised of outstanding claims and those that are closed with a loss payment and exclude those that are closed without a loss payment. A single claim event may result in multiple claims closed with a payment when a claim is subsequently reopened with further payment. In this case, a reopened claim payment is counted as an incremental claim settlement. Claim count information is not available for direct and assumed participations in various involuntary pools and residual market mechanisms, which represent approximately 4% or less of the total net earned premium and net incurred claims for the lines presented. Incurred claim counts are also not adjusted for the effect of claims ceded as part of reinsurance programs, although the incurred losses and cumulative paid losses presented in the following tables are presented net of reinsurance ceded.

Core Commercial - commercial multiple peril
($ in millions)

Incurred Losses and ALAE, Net of Reinsurance									As of December 31, 2022	
YEARS ENDED DECEMBER 31,										
Accident Year	2015 Unaudited	2016 Unaudited	2017 Unaudited	2018 Unaudited	2019 Unaudited	2020 Unaudited	2021 Unaudited	2022	IBNR	Cumulative Incurred Claim Count
2015	$ 398.1	$ 412.9	$ 418.6	$ 421.9	$ 419.0	$ 414.0	$ 410.1	**$ 408.3**	**$ 10.6**	**14,497**
2016		398.2	402.5	401.0	400.0	400.1	396.7	**397.2**	**8.3**	**14,428**
2017			473.9	481.1	487.5	491.5	494.0	**493.6**	**17.4**	**15,359**
2018				511.1	495.6	489.5	490.6	**495.8**	**24.2**	**15,864**
2019					520.2	527.0	533.1	**542.6**	**44.8**	**14,948**
2020						562.1	546.7	**531.5**	**84.1**	**13,066**
2021							673.5	**658.7**	**130.9**	**14,753**
2022								**748.1**	**351.1**	**12,094**
Total								**$ 4,275.8**		

Cumulative Paid Losses and ALAE, Net of Reinsurance								
YEARS ENDED DECEMBER 31,								
Accident Year	2015 Unaudited	2016 Unaudited	2017 Unaudited	2018 Unaudited	2019 Unaudited	2020 Unaudited	2021 Unaudited	2022
2015	$ 152.9	$ 241.0	$ 289.6	$ 329.6	$ 358.5	$ 372.7	$ 379.6	**$ 384.6**
2016		128.7	215.2	261.9	306.8	331.8	347.7	**365.4**
2017			157.2	264.1	328.8	377.6	414.5	**435.6**
2018				165.7	274.1	326.4	362.9	**403.6**
2019					156.5	288.5	348.7	**396.3**
2020						200.8	318.6	**364.2**
2021							245.1	**392.6**
2022								**198.2**
Total								**2,940.5**
Total reserves for 2015 – 2022 accident years (incurred - paid)								**1,335.3**
Total reserves for 2014 and prior accident years								**67.8**
Unallocated loss adjustment expense								**20.8**
Net reserves at December 31, 2022								**$ 1,423.9**

Core Commercial - workers' compensation
($ in millions)

Incurred Losses and ALAE, Net of Reinsurance											As of December 31, 2022	
	YEARS ENDED DECEMBER 31,											
Accident Year	2013 Unaudited	2014 Unaudited	2015 Unaudited	2016 Unaudited	2017 Unaudited	2018 Unaudited	2019 Unaudited	2020 Unaudited	2021 Unaudited	2022	IBNR	Cumulative Incurred Claim Count
2013	$ 133.0	$ 134.0	$ 126.0	$ 120.1	$ 121.0	$ 121.4	$ 121.1	$ 119.4	$ 118.9	**$ 116.2**	**$ 6.1**	**9,178**
2014		143.5	138.0	125.8	124.3	123.1	120.7	118.2	116.4	**112.9**	**7.5**	**8,807**
2015			157.0	136.0	132.1	125.8	122.2	119.0	116.3	**113.8**	**10.5**	**8,911**
2016				158.9	152.8	139.9	133.5	128.3	124.9	**122.3**	**10.0**	**12,811**
2017					159.6	148.7	139.9	136.7	132.4	**129.6**	**11.0**	**13,415**
2018						165.2	161.3	152.6	150.8	**149.2**	**14.4**	**14,905**
2019							170.5	165.0	162.9	**163.2**	**16.7**	**15,307**
2020								167.1	166.8	**150.6**	**24.2**	**11,904**
2021									178.5	**180.8**	**30.9**	**14,040**
2022										**198.5**	**64.6**	**14,269**
Total										**$1,437.1**		

Cumulative Paid Losses and ALAE, Net of Reinsurance										
	YEARS ENDED DECEMBER 31,									
Accident Year	2013 Unaudited	2014 Unaudited	2015 Unaudited	2016 Unaudited	2017 Unaudited	2018 Unaudited	2019 Unaudited	2020 Unaudited	2021 Unaudited	2022
2013	$ 24.0	$ 58.0	$ 78.9	$ 87.9	$ 94.8	$ 98.2	$ 101.2	$ 102.6	$ 104.0	**$ 104.5**
2014		25.7	58.5	75.3	85.0	89.8	93.7	96.2	97.6	**98.5**
2015			24.2	55.0	72.2	81.8	86.2	89.1	91.2	**93.2**
2016				29.2	67.0	84.4	93.3	97.2	100.1	**102.1**
2017					28.5	63.7	82.0	92.7	99.0	**102.6**
2018						32.2	72.0	91.7	104.2	**112.0**
2019							30.4	75.7	102.4	**116.2**
2020								28.8	71.4	**91.8**
2021									40.6	**85.3**
2022										**41.4**
Total										**947.6**
Total reserves for 2013 – 2022 accident years (incurred - paid)										**489.5**
Total reserves for 2012 and prior accident years										**85.6**
Unallocated loss adjustment expense and other										**18.8**
Net reserves at December 31, 2022										**$ 593.9**

Core Commercial - commercial automobile liability
($ in millions)

Incurred Losses and ALAE, Net of Reinsurance								As of December 31, 2022	
YEARS ENDED DECEMBER 31,									
Accident Year	2016 Unaudited	2017 Unaudited	2018 Unaudited	2019 Unaudited	2020 Unaudited	2021 Unaudited	2022	IBNR	Cumulative Incurred Claim Count
2016	$ 144.5	$ 144.9	$ 151.4	$ 161.6	$ 159.5	$ 160.8	**$ 163.3**	**$ —**	**10,944**
2017		146.3	155.6	164.3	169.4	175.6	**176.0**	**1.8**	**10,910**
2018			170.1	157.6	162.9	171.5	**176.1**	**6.0**	**10,613**
2019				161.0	167.9	169.7	**174.6**	**15.1**	**9,787**
2020					153.2	141.5	**140.2**	**34.0**	**5,895**
2021						154.1	**156.5**	**63.0**	**6,066**
2022							**157.5**	**100.1**	**5,374**
Total							**$ 1,144.2**		

Cumulative Paid Losses and ALAE, Net of Reinsurance							
YEARS ENDED DECEMBER 31,							
Accident Year	2016 Unaudited	2017 Unaudited	2018 Unaudited	2019 Unaudited	2020 Unaudited	2021 Unaudited	2022
2016	$ 26.1	$ 56.5	$ 92.0	$ 125.1	$ 137.0	$ 143.8	**$ 152.0**
2017		24.9	64.8	95.5	125.8	144.4	**160.9**
2018			26.8	52.7	83.2	114.5	**142.7**
2019				27.1	64.5	94.8	**126.5**
2020					21.0	42.1	**71.4**
2021						17.7	**45.2**
2022							**18.9**
Total							**717.6**
Total reserves for 2016 – 2022 accident years (incurred - paid)							**426.6**
Total reserves for 2015 and prior accident years							**16.4**
Unallocated loss adjustment expense							**4.9**
Net reserves at December 31, 2022							**$ 447.9**

Core Commercial - general liability and umbrella - occurrence
($ in millions)

Incurred Losses and ALAE, Net of Reinsurance											As of December 31, 2022	
YEARS ENDED DECEMBER 31,												
Accident Year	2013 Unaudited	2014 Unaudited	2015 Unaudited	2016 Unaudited	2017 Unaudited	2018 Unaudited	2019 Unaudited	2020 Unaudited	2021 Unaudited	2022	IBNR	Cumulative Incurred Claim Count
2013	$ 52.1	$ 44.4	$ 41.5	$ 50.4	$ 46.9	$ 42.5	$ 40.1	$ 39.6	$ 39.0	**$ 38.6**	**$ 1.9**	**1,458**
2014		70.7	48.9	57.9	60.8	53.8	54.0	53.4	54.0	**54.0**	**3.5**	**1,442**
2015			66.6	57.9	58.6	53.8	52.1	50.5	49.1	**45.5**	**3.2**	**1,303**
2016				58.5	61.0	57.8	55.8	53.7	54.5	**54.2**	**5.5**	**1,199**
2017					58.2	67.1	66.3	63.0	62.9	**61.0**	**8.4**	**1,027**
2018						58.8	61.1	60.3	63.3	**63.2**	**13.5**	**952**
2019							58.9	60.0	60.3	**69.3**	**15.8**	**827**
2020								56.2	58.9	**53.4**	**29.1**	**518**
2021									58.3	**70.0**	**41.0**	**473**
2022										**63.3**	**50.5**	**395**
Total										**$ 572.5**		

Cumulative Paid Losses and ALAE, Net of Reinsurance										
YEARS ENDED DECEMBER 31,										
Accident Year	2013 Unaudited	2014 Unaudited	2015 Unaudited	2016 Unaudited	2017 Unaudited	2018 Unaudited	2019 Unaudited	2020 Unaudited	2021 Unaudited	2022
2013	$ 1.1	$ 5.3	$ 12.7	$ 21.7	$ 28.6	$ 32.7	$ 34.1	$ 34.9	$ 35.3	**$ 35.3**
2014		1.6	7.9	17.2	30.3	38.2	45.5	46.0	47.4	**48.4**
2015			1.4	7.5	14.1	25.5	32.6	37.3	38.3	**40.7**
2016				0.7	7.3	14.8	25.3	31.7	34.4	**38.7**
2017					2.3	9.0	19.3	27.1	33.9	**42.6**
2018						1.0	4.4	18.8	27.2	**38.1**
2019							4.3	8.7	16.5	**28.2**
2020								2.1	9.2	**11.9**
2021									1.5	**6.6**
2022										**0.4**
Total										**290.9**
Total reserves for 2013 – 2022 accident years (incurred - paid)										**281.6**
Total reserves for 2012 and prior accident years										**11.9**
Unallocated loss adjustment expense and other										**3.4**
Net reserves at December 31, 2022										**$ 296.9**

Specialty property & casualty
($ in millions)

Incurred Losses and ALAE, Net of Reinsurance								As of December 31, 2022	
YEARS ENDED DECEMBER 31,									
Accident Year	2016 Unaudited	2017 Unaudited	2018 Unaudited	2019 Unaudited	2020 Unaudited	2021 Unaudited	2022	IBNR	Cumulative Incurred Claim Count
2016	$ 157.9	$ 152.4	$ 153.4	$ 154.1	$ 156.6	$ 157.3	**$ 158.9**	**$ 5.4**	**6,473**
2017		189.6	185.3	190.1	193.9	195.6	**199.1**	**10.1**	**6,862**
2018			193.0	194.1	193.7	190.2	**191.1**	**13.6**	**6,440**
2019				212.2	209.4	225.7	**237.1**	**24.0**	**6,496**
2020					181.1	170.8	**164.9**	**35.1**	**5,232**
2021						202.9	**213.9**	**63.0**	**5,897**
2022							**218.3**	**110.3**	**5,175**
Total							**$ 1,383.3**		

Cumulative Paid Losses and ALAE, Net of Reinsurance							
YEARS ENDED DECEMBER 31,							
Accident Year	2016 Unaudited	2017 Unaudited	2018 Unaudited	2019 Unaudited	2020 Unaudited	2021 Unaudited	2022
2016	$ 40.5	$ 75.1	$ 95.3	$ 117.1	$ 126.9	$ 134.4	**$ 143.7**
2017		55.5	102.6	125.9	138.7	155.6	**168.5**
2018			56.0	107.9	124.9	140.3	**158.6**
2019				71.5	113.9	136.5	**164.9**
2020					40.4	84.0	**101.2**
2021						59.2	**106.6**
2022							**60.7**
Total							**904.2**
Total reserves for 2016 – 2022 accident years (incurred - paid)							**479.1**
Total reserves for 2015 and prior accident years							**39.2**
Unallocated loss adjustment expense							**23.5**
Net reserves at December 31, 2022							**$ 541.8**

Specialty - general liability - claims made
($ in millions)

Incurred Losses and ALAE, Net of Reinsurance								As of December 31, 2022	
YEARS ENDED DECEMBER 31,									
Accident Year	2016 Unaudited	2017 Unaudited	2018 Unaudited	2019 Unaudited	2020 Unaudited	2021 Unaudited	2022	IBNR	Cumulative Incurred Claim Count
2016	$ 99.5	$ 98.6	$ 95.1	$ 88.4	$ 94.0	$ 94.0	**$ 97.4**	**$ 1.5**	**974**
2017		99.1	100.6	96.1	94.1	92.5	**93.6**	**1.6**	**1,067**
2018			112.2	117.8	121.2	121.7	**121.6**	**5.8**	**1,176**
2019				119.8	119.5	125.6	**127.6**	**12.9**	**1,258**
2020					137.3	134.2	**123.3**	**22.3**	**1,379**
2021						148.2	**144.8**	**54.7**	**1,372**
2022							**162.3**	**99.0**	**2,108**
Total							**$ 870.6**		

Cumulative Paid Losses and ALAE, Net of Reinsurance							
YEARS ENDED DECEMBER 31,							
Accident Year	2016 Unaudited	2017 Unaudited	2018 Unaudited	2019 Unaudited	2020 Unaudited	2021 Unaudited	2022
2016	$ 10.8	$ 42.4	$ 65.3	$ 74.3	$ 79.3	$ 85.2	**$ 92.0**
2017		12.1	40.9	65.5	74.8	81.0	**86.3**
2018			14.4	50.3	78.9	93.6	**102.9**
2019				16.5	53.3	77.0	**95.4**
2020					16.8	50.6	**75.0**
2021						15.8	**49.9**
2022							**18.1**
Total							**519.6**
Total reserves for 2016 – 2022 accident years (incurred - paid)							**351.0**
Total reserves for 2015 and prior accident years							**5.3**
Unallocated loss adjustment expense							**6.1**
Net reserves at December 31, 2022							**$ 362.4**

Personal automobile liability
($ in millions)

Incurred Losses and ALAE, Net of Reinsurance						As of December 31, 2022	
YEARS ENDED DECEMBER 31,							
Accident Year	2018 Unaudited	2019 Unaudited	2020 Unaudited	2021 Unaudited	2022	IBNR	Cumulative Incurred Claim Count
2018	$ 394.2	$ 395.3	$ 400.3	$ 406.7	**$ 409.3**	**$ 6.5**	**43,092**
2019		431.2	431.8	436.1	**438.9**	**14.5**	**42,402**
2020			378.0	347.0	**312.3**	**34.4**	**26,334**
2021				407.2	**411.6**	**84.3**	**30,164**
2022					**441.9**	**195.1**	**29,366**
Total					**$ 2,014.0**		

Cumulative Paid Losses and ALAE, Net of Reinsurance					
YEARS ENDED DECEMBER 31,					
Accident Year	2018 Unaudited	2019 Unaudited	2020 Unaudited	2021 Unaudited	2022
2018	$ 121.7	$ 237.2	$ 307.4	$ 353.1	**$ 382.8**
2019		131.0	262.2	336.6	**385.1**
2020			95.9	179.2	**231.8**
2021				106.4	**225.9**
2022					**117.2**
Total					**1,342.8**
Total reserves for 2018 – 2022 accident years (incurred - paid)					**671.2**
Total reserves for 2017 and prior accident years					**57.3**
Unallocated loss adjustment expense					**17.6**
Net reserves at December 31, 2022					**$ 746.1**

Homeowners
($ in millions)

Incurred Losses and ALAE, Net of Reinsurance					As of December 31, 2022	
YEARS ENDED DECEMBER 31,						
Accident Year	2019 Unaudited	2020 Unaudited	2021 Unaudited	2022	IBNR	Cumulative Incurred Claim Count
2019	$ 344.5	$ 345.3	$ 342.1	**$ 340.7**	**2.9**	**33,747**
2020		418.8	423.3	**424.9**	**4.3**	**35,294**
2021			461.4	**489.9**	**18.9**	**38,925**
2022				**548.5**	**141.5**	**29,556**
Total				**$ 1,804.0**		

Cumulative Paid Losses and ALAE, Net of Reinsurance				
YEARS ENDED DECEMBER 31,				
Accident Year	2019 Unaudited	2020 Unaudited	2021 Unaudited	2022
2019	$ 234.7	$ 311.7	$ 322.5	**$ 329.2**
2020		281.5	387.7	**408.1**
2021			306.9	**449.1**
2022				**324.1**
Total				**1,510.5**
Total reserves for 2019 – 2022 accident years (incurred - paid)				**293.5**
Total reserves for 2018 and prior accident years				**11.9**
Unallocated loss adjustment expense				**4.1**
Net reserves at December 31, 2022				**$ 309.5**

The following table is information about average historical claims duration as of December 31, 2022. The table is computed based on the paid and incurred claims data, net of reinsurance, for the accident years presented in the preceding claims development tables.

Average Annual Percentage Payout of Incurred Claims by Age, Net of Reinsurance:
Unaudited

	1	2	3	4	5	6	7	8	9	10
Core Commercial - commercial multiple peril	33.2%	22.3%	11.2%	9.4%	7.3%	3.9%	3.1%	1.2%		
Core Commercial - workers' compensation	21.3%	27.9%	14.9%	8.2%	4.5%	2.8%	2.1%	1.4%	1.0%	0.4%
Core Commercial - commercial automobile liability	14.2%	18.3%	19.0%	18.3%	11.3%	6.8%	5.0%			
Core Commercial - general liability and umbrella - occurrence	2.8%	10.2%	15.1%	19.2%	14.8%	10.7%	3.7%	3.3%	1.5%	0.0%
Specialty property & casualty	27.5%	23.2%	10.7%	10.0%	8.1%	5.6%	5.8%			
Specialty - general liability - claims made	12.1%	28.7%	22.4%	11.4%	6.4%	5.9%	7.0%			
Personal automobile liability	28.5%	28.5%	17.0%	11.1%	7.3%					
Homeowners	64.2%	25.5%	4.0%	2.0%						

15. COMMITMENTS AND CONTINGENCIES

Legal Proceedings

The Company has been named a defendant in various legal proceedings arising in the normal course of business. In addition, the Company is involved, from time to time, in examinations, investigations and proceedings by governmental and self-regulatory agencies. The potential outcome of any such action or regulatory proceedings in which the Company has been named a defendant or the subject of an inquiry, examination or investigation, and its ultimate liability, if any, from such action or regulatory proceedings, is difficult to predict at this time. The ultimate resolutions of such proceedings are not expected to have a material effect on its financial position, although they could have a material effect on the results of operations for a particular quarterly or annual period.

Residual Markets

The Company is required to participate in residual markets in various states, which generally pertain to high risk insureds, disrupted markets or lines of business or geographic areas where rates are regarded as excessive. The results of the residual markets are not subject to the predictability associated with the Company's own managed business, and are significant to both the personal and commercial automobile lines of business.

16. STATUTORY FINANCIAL INFORMATION

The Company's insurance subsidiaries are required to file annual statements with state regulatory authorities prepared on an accounting basis prescribed or permitted by such authorities (statutory basis), as codified by the National Association of Insurance Commissioners ("NAIC"). Permitted statutory accounting practices encompass all accounting practices that are not prescribed; such practices differ from state to state, may differ from company to company within a state, and may change in the future. The Company's insurance subsidiaries did not have any permitted practices as of or for the years ended December 31, 2022, 2021 and 2020.

Statutory capital and surplus differs from shareholders' equity reported in accordance with U.S. GAAP primarily because under the statutory basis of accounting, deferred acquisition costs are expensed when incurred and the recognition of deferred tax assets is based on different recoverability assumptions.

The following table provides statutory net income for the years ended December 31 and statutory capital and surplus for the insurance subsidiaries as of December 31 for the periods indicated:

(in millions)	2022	2021	2020
Statutory Net Income	**$ 231.8**	$ 301.3	$ 360.9
Statutory Capital and Surplus	**2,690.4**	2,720.0	2,588.5

The minimum statutory capital and surplus necessary to satisfy the Company's regulatory requirements was $645.6 million, $593.9 million and $552.6 million, which equals the Authorized Control Level at December 31, 2022, 2021 and 2020, respectively.

17. SUBSEQUENT EVENTS

There were no subsequent events requiring adjustment to the financial statements and no additional disclosures required in the notes to the consolidated financial statements.

ITEM 9–CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

None.

ITEM 9A–CONTROLS AND PROCEDURES

DISCLOSURE CONTROLS AND PROCEDURES EVALUATION

Under the supervision and with the participation of our management, including our Chief Executive Officer and Chief Financial Officer, we conducted an evaluation of our "disclosure controls and procedures," as such term is defined under Rule 13a-15(e) promulgated under the Securities Exchange Act of 1934, as amended (the "Exchange Act").

LIMITATIONS ON THE EFFECTIVENESS OF CONTROLS

Our management, including our Chief Executive Officer and Chief Financial Officer, do not expect that our disclosure controls over financial reporting will prevent all error and all fraud. A control system, no matter how well designed and operated, can provide only reasonable, not absolute, assurance that the control system's objectives will be met. Further, the design of a control system must reflect the fact that there are resource constraints, and the benefits of controls must be considered relative to their costs. 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. These inherent limitations include the realities that judgments in decision-making can be faulty and breakdowns can occur because of simple error or mistake. Controls can also be circumvented by the individual acts of some persons, by collusion of two or more people, or by management override of the controls. The design of any system of controls is based in part on 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. Over time, controls may become inadequate because of changes in conditions or deterioration in the degree of compliance with policies or procedures. Because of the inherent limitations in a cost-effective control system, misstatements due to error or fraud may occur and not be detected.

CONCLUSION REGARDING THE EFFECTIVENESS OF DISCLOSURE CONTROLS AND PROCEDURES

Based on our controls evaluation, our Chief Executive Officer and Chief Financial Officer concluded that, as of the end of the period covered by this annual report, our disclosure controls and procedures were effective to provide reasonable assurance that (i) the information required to be disclosed by us in reports that we file or submit under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms and (ii) material information is accumulated and communicated to our management, including our Chief Executive Officer and Chief Financial Officer, as appropriate to allow timely decisions regarding required disclosure.

INTERNAL CONTROL OVER FINANCING REPORTING

MANAGEMENT'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING

Our management is responsible for establishing and maintaining adequate "internal control over financial reporting," as such term is defined in Exchange Act Rule 13a-15(f). Under the supervision and with the participation of our management, including our Chief Executive Officer and Chief Financial Officer, we conducted an evaluation of the effectiveness of our internal control over financial reporting based on the updated *Internal Control – Integrated Framework* issued in 2013 by the Committee of Sponsoring Organizations of the Treadway Commission. Based on our evaluation under the updated framework in *Internal Control – Integrated Framework*, our management concluded that our internal control over financial reporting was effective as of December 31, 2022.

The effectiveness of our internal control over financial reporting as of December 31, 2022 has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm, as stated in their report which is included herein.

CHANGES IN INTERNAL CONTROL

Our management, including our Chief Executive Officer and Chief Financial Officer, conducted an evaluation of the internal control over financial reporting, as required by Rule 13a-15(d) of the Exchange Act, to determine whether any changes occurred during the period covered by this Annual Report on Form 10-K that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting. Based on that evaluation, our Chief Executive Officer and Chief Financial Officer concluded that there was no such change during the last quarter of the fiscal year covered by this Annual Report on Form 10-K that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

ITEM 9B-OTHER INFORMATION

None.

ITEM 9C-DISCLOSURE REGARDING FOREIGN JURISDICTIONS THAT PREVENT INSPECTIONS

Not applicable.

PART III

ITEM 10–DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

DIRECTORS OF THE REGISTRANT

Except for the portions about executive officers and our Code of Conduct that are set forth below, this information is incorporated herein by reference to the Proxy Statement for the Annual Meeting of Shareholders to be held on May 9, 2023 to be filed pursuant to Regulation 14A under the Exchange Act.

EXECUTIVE OFFICERS OF THE REGISTRANT

Set forth below is biographical information concerning our executive officers.

Jeffrey M. Farber, 58

Executive Vice President, Chief Financial Officer

Mr. Farber joined THG in October 2016 after spending the previous five years with American International Group (AIG). He joined AIG as Senior Vice President and Deputy Chief Financial Officer and then was appointed Chief Risk Officer, Commercial and Consumer Business. Prior to AIG, Mr. Farber served as Executive Vice President and Chief Financial Officer of GAMCO Investors, Inc., a public company asset manager. Previously, he held senior accounting and finance roles at The Bear Stearns Companies, Inc., most recently as Senior Managing Director, Controller and Senior Vice President, responsible for finance, tax and global procurement. He began his career at Deloitte & Touche LLP, rising to partner in the firm.

Dennis F. Kerrigan, 58

Executive Vice President, General Counsel and Assistant Secretary

Mr. Kerrigan joined the Company as Executive Vice President, Deputy General Counsel and Assistant Secretary, in January 2020, becoming General Counsel in April 2020. Before joining THG, Mr. Kerrigan was Executive Vice President, General Counsel and Corporate Secretary for Zurich North America, from 2008 to 2019. Previously, he was a litigation partner with the law firm then known as Dewey & LeBoeuf.

Richard W. Lavey, 55

Executive Vice President; President, Hanover Agency Markets

Mr. Lavey has served as Executive Vice President, and President Hanover Agency Markets since November 2017. Mr. Lavey previously served as Executive Vice President, Chief Growth Innovation Officer from February 2017 to November 2017. Prior to that time, he was President, Personal Lines of THG since November 2014 and Chief Marketing Officer since 2011, assuming responsibility for Field Operations in 2016. Mr. Lavey joined THG in 2004 and during this time has also served in the following roles: Chief Distribution Officer, Senior Vice President, Operations and Marketing; Regional President, Northeast; and Vice President, Field Operations and Marketing and Distribution. Prior to joining the Company, Mr. Lavey worked for The Hartford Financial Services Group, Inc. and The Travelers Corp.

Willard T. Lee, 53

Executive Vice President, Chief Information and Innovation Officer

Mr. Lee became Executive Vice President, Chief Information Officer in April 2021 after briefly serving as Deputy Chief Information and Technology Innovation Officer. Prior to that time, he was Business and Innovation CIO of THG since October 2017 and Chief Operating Officer, Specialty Lines since June 2012. Mr. Lee joined THG in May 2003 and during this time has also served in the following roles: Vice President, Corporate Development and Vice President, Commercial Lines Product Development. Prior to joining THG, Mr. Lee worked for BancTec/Plexus.

David J. Lovely, 60

Executive Vice President, Chief Claims Officer

Mr. Lovely joined the Company as Executive Vice President and Chief Claims Officer in January 2023. Prior to joining THG, he served as Director, Financial Crime Unit, at PricewaterhouseCoopers ("PWC"), a global, leading public accounting, audit and consulting firm, from June 2022 to December 2022.

Before joining PWC, Mr. Lovely was the UK and Global Chief Claims Officer of Aviva from May 2014 to December 2021, and had spent many years in senior claims leadership roles at companies including Chubb Insurance, Allianz Insurance Group and General Electric Company, and began his career at Liberty Mutual.

Denise M. Lowsley, 51

Executive Vice President, Chief Human Resources Officer

Ms. Lowsley joined the Company as Executive Vice President and Chief Human Resources Officer in October 2019. Prior to joining the Company, she spent the previous 10 years as Senior Vice President and Chief Human Resources Officer at The Navigators Group, Inc., a specialty property and casualty insurance holding company. Before joining Navigators, Ms. Lowsley was International Vice President, Compensation and Benefits at New York Life Insurance Company, and had spent the previous 10 years at Liberty Mutual Insurance Group, rising to the role of Global Human Resources Manager.

John C. Roche, 59

President and Chief Executive Officer

Mr. Roche became President and Chief Executive Officer in November 2017. Prior to that he led the Company's personal and commercial lines businesses as Executive Vice President and President, Hanover Agency Markets. Since joining the Company in 2006, Mr. Roche has served in several senior leadership positions, including President, Business Insurance; Vice President, Field Operations, Marketing and Distribution; and Vice President, Commercial Lines Underwriting and Product Management. Prior to joining the Company, he served in senior roles at the St. Paul Travelers Companies. He began his career at Fireman's Fund and Atlantic Mutual, where he held a number of underwriting and management positions.

Bryan J. Salvatore, 58

Executive Vice President; President, Specialty

Mr. Salvatore joined the Company in June 2017 as Executive Vice President and President, Specialty. Prior to joining the Company, he spent 20 years with Zurich North America in a number of leadership roles, most recently serving as President of the company's specialty products business since 2012. Prior to joining Zurich in 1997, Mr. Salvatore was a Director in the programs division of Frank Crystal & Co., Inc., a leading brokerage firm.

OTHER SENIOR CORPORATE OFFICER OF THE REGISTRANT

Warren E. Barnes, 61

Senior Vice President, Corporate Controller and Principal Accounting Officer

Mr. Barnes was appointed Principal Accounting Officer in 2015. Mr. Barnes joined the Company in 1993, and has been its Controller since 1997. Before joining the Company, Mr. Barnes was employed from 1985 to 1993 by the public accounting firm then known as Price Waterhouse. He is a certified public accountant in the Commonwealth of Massachusetts and the State of Vermont.

Pursuant to section 4.4 of the Company's by-laws, each officer shall hold office until the first meeting of the Board of Directors following the next annual meeting of the shareholders and until his or her respective successor is chosen and qualified unless a shorter period shall have been specified by the terms of his or her election or appointment, or in each case until such officer sooner dies, resigns, is removed or becomes disqualified.

ANNUAL MEETING OF SHAREHOLDERS

The 2023 Annual Meeting of Shareholders has been scheduled for May 9, 2023. The record date for determining the shareholders of the Company entitled to notice of and to vote at such Annual Meeting is March 17, 2023.

CODE OF CONDUCT

Our Code of Conduct is available, free of charge, on our website at www.hanover.com under "Why The Hanover – Our Governance – Company Policies". The Code of Conduct applies to our directors, officers and employees, including our Chief Executive Officer, Chief Financial Officer and Corporate Controller. In addition, we expect our agents, contractors and others with whom we do business to act in accordance with our Code of Conduct. We will disclose any future amendments to the Code of Conduct (other than technical, administrative or non-substantive amendments) within four business days following the date of such amendment. While we do not expect to grant waivers to our Code of Conduct, any such waivers to our Chief Executive Officer, Chief Financial Officer or Corporate Controller will be posted on our website at www.hanover.com, as required by applicable law or New York Stock Exchange requirements. A printed copy of the Code of Conduct will be provided, free of charge, by contacting the Company's Corporate Secretary at the Company's headquarters, 440 Lincoln Street, Worcester, MA 01653.

ITEM 11–EXECUTIVE COMPENSATION

Incorporated herein by reference from the Proxy Statement for the Annual Meeting of Shareholders to be held May 9, 2023, to be filed pursuant to Regulation 14A under the Securities Exchange Act of 1934.

ITEM 12–SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

Securities Authorized for Issuance Under Equity Compensation Plans

The following table sets forth information as of December 31, 2022 with respect to compensation plans under which equity securities of the Company are authorized for issuance.

Plan Category	Number of securities to be issued upon exercise of outstanding options, warrants and rights [1]	Weighted average exercise price of outstanding options, warrants and rights	Number of securities remaining available for future issuance under equity compensation plans [2]
Equity compensation plans approved by security holders	1,663,634	$ 107.07	5,694,569
Equity compensation plans not approved by security holders	—	—	—
Total	1,663,634	$ 107.07	5,694,569

(1) Includes 582,782 shares of common stock which may be issued upon vesting of outstanding restricted stock units, performance-based restricted stock units, and market-based restricted stock units (assuming the maximum award amount) of which, 22,382 represent dividend equivalent shares associated with the 2020, 2021 and 2022 awards. The weighted average exercise price does not take these awards into account.

(2) On May 10, 2022 the shareholders approved The Hanover Insurance Group 2022 Long-Term Incentive Plan (the "2022 Stock Plan"). With respect to new share-based issuances, the 2022 Stock Plan replaced The Hanover Insurance Group, Inc. 2014 Long-Term Incentive Plan (the "2014 Stock Plan") and provided authorization for 3,380,000 shares in a new share pool plus any shares subject to outstanding awards under the 2014 Stock Plan that may become available for reissuance as a result of the cash settlement, forfeiture, expiration or cancellation of such awards. In accordance with the 2022 Stock Plan, the issuance of one share of common stock in the form of an option or Stock Appreciation Right will reduce the share pool by one share, whereas the issuance of one share of common stock for the other types of stock awards provided by the Plan will reduce the pool by 3.2 shares. Previously, on May 20, 2014, the shareholders approved The Hanover Insurance Group 2014 Employee Stock Purchase Plan, authorizing the issuance of 2,500,000 shares, under such plan.

Additional information related to Security Ownership of Certain Beneficial Owners and Management is incorporated herein by reference from the Proxy Statement for the Annual Meeting of Shareholders to be held May 9, 2023, to be filed pursuant to Regulation 14A under the Securities Exchange Act of 1934.

ITEM 13–CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE

Incorporated herein by reference from the Proxy Statement for the Annual Meeting of Shareholders to be held May 9, 2023, to be filed pursuant to Regulation 14A under the Securities Exchange Act of 1934.

ITEM 14–PRINCIPAL ACCOUNTANT FEES AND SERVICES

Incorporated herein by reference from the Proxy Statement for the Annual Meeting of Shareholders to be held May 9, 2023, to be filed pursuant to Regulation 14A under the Securities Exchange Act of 1934.

PART IV

ITEM 15–EXHIBITS, FINANCIAL STATEMENT SCHEDULES

(A)(1) FINANCIAL STATEMENTS

The consolidated financial statements and accompanying notes thereto are included on pages 67 to 110 of this Form 10-K.

	Page No. in this Report
Report of Independent Registered Public Accounting Firm (PCAOB ID 238)	67
Consolidated Statements of Income for the years ended December 31, 2022, 2021 and 2020	69
Consolidated Statements of Comprehensive Income for the years ended December 31, 2022, 2021 and 2020	70
Consolidated Balance Sheets as of December 31, 2022 and 2021	71
Consolidated Statements of Shareholders' Equity for the years ended December 31, 2022, 2021 and 2020	72
Consolidated Statements of Cash Flows for the years ended December 31, 2022, 2021 and 2020	73
Notes to Consolidated Financial Statements	74

(A)(2) FINANCIAL STATEMENTS SCHEDULES

		Page No. in this Report
I	Summary of Investments - Other than Investments in Related Parties as of December 31, 2022	122
II	Condensed Financial Information of Registrant as of December 31, 2022 and 2021, and for the years ended December 31, 2022, 2021 and 2020	123
III	Supplementary Insurance Information as of and for the years ended December 31, 2022, 2021 and 2020	126
IV	Reinsurance	127
V	Valuation and Qualifying Accounts as of December 31, 2022, 2021 and 2020	128
VI	Supplemental Information Concerning Property and Casualty Insurance Operations as of December 31, 2022 and 2021, and for the years ended December 31, 2022, 2021 and 2020	129

(A)(3) EXHIBIT INDEX

2.1 Agreement for the Sale and Purchase of Shares in the Capital of The Hanover Insurance International Holdings Limited, Chaucer Insurance Company Designated Activity Company and Hanover Australia HoldCo Pty Ltd., dated September 13, 2018, by and between the Registrant and China Reinsurance (Group) Corporation (the schedules and exhibits have been omitted pursuant to Item 601(b)(2) of Regulation S-K), previously filed as Exhibit 2.1 to the Registrant's Current Report on Form 8-K filed with the Commission on September 13, 2018 and incorporated herein by reference.

2.2 Supplemental Agreement by and between the Registrant and China Reinsurance (Group) Corporation, dated December 28, 2018 relating to the Agreement for the Sale and Purchase of Shares in the Capital of The Hanover Insurance International Holdings Limited, Chaucer Insurance Company Designated Activity Company and Hanover Australia HoldCo Pty Ltd., dated September 13, 2018, by and between the Registrant and China Reinsurance (Group) Corporation, previously filed as Exhibit 2.1 to the Registrant's Current Report on Form 8-K filed with the Commission on January 3, 2019 and incorporated herein by reference.

2.3 Second Supplemental Agreement by and between the Registrant and China Reinsurance (Group) Corporation, dated March 27, 2019 relating to the Agreement for the Sale and Purchase of Shares in the Capital of The Hanover Insurance International Holdings Limited, Chaucer Insurance Company Designated Activity Company and Hanover Australia HoldCo Pty Ltd., dated September 13, 2018, by and between the Registrant and China Reinsurance (Group) Corporation, previously filed as Exhibit 2.1 to the Registrant's Quarterly Report on Form 10-Q filed with the Commission on May 2, 2019 and incorporated herein by reference.

3.1 Certificate of Incorporation of the Registrant, previously filed as Exhibit 3.1 to the Registrant's Annual Report on Form 10-K filed with the Commission on March 16, 2006 and incorporated herein by reference.

3.2 Amended By-Laws of the Registrant, previously filed as Exhibit 3.2 to the Registrant's Current Report on Form 8-K filed with the Commission on November 21, 2006 and incorporated herein by reference.

4.1 Specimen Certificate of the Registrant's Common Stock, previously filed as Exhibit 4 to the Registrant's Annual Report on Form 10-K filed with the Commission on March 16, 2006 and incorporated herein by reference.

4.2 Form of Indenture relating to the Debentures between the Registrant, as issuer, and State Street Bank & Trust Company, as trustee, previously filed as Exhibit 4.1 to the Registrant's Registration Statement on Form S-1 (File No. 33-96764) filed with the Commission on September 11, 1995 and incorporated herein by reference. (P)

4.3 Form of Global Debenture relating to the Registrant's 7 5/8% Senior Debentures due 2025, previously filed as Exhibit 4.2 to the Registrant's Annual Report on Form 10-K filed with the Commission on March 16, 2006 and incorporated herein by reference.

4.4 Indenture, dated February 3, 1997, relating to the Registrant's Junior Subordinated Debentures, previously filed as Exhibit 3 to the Registrant's Current Report on Form 8-K filed with the Commission on February 5, 1997 and incorporated herein by reference.

4.5 First Supplemental Indenture, dated July 30, 2009, amending the indenture dated February 3, 1997 relating to the Junior Subordinated Debentures of the Registrant, previously filed as Exhibit 4.5 to the Registrant's Annual Report on Form 10-K filed with the Commission on March 1, 2010 and incorporated herein by reference.

4.6 Form of Global Security representing $300,000,000 principal amount of Junior Subordinated Debentures of the Registrant, previously filed as Exhibit 4.6 to the Registrant's Annual Report on Form 10-K filed with the Commission on March 1, 2010 and incorporated herein by reference.

4.7 Base Indenture, dated as of April 8, 2016, between the Registrant, as issuer, and U.S. Bank National Association, as trustee, previously filed as Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed with the Commission on April 8, 2016 and incorporated herein by reference.

4.8 First Supplemental Indenture (to the Base Indenture dated as of April 8, 2016), as of April 8, 2016, between the Registrant, as issuer, and U.S. Bank National Association, as trustee, previously filed as Exhibit 4.2 to the Registrant's Current Report on Form 8-K filed with the Commission on April 8, 2016 and incorporated herein by reference.

4.9 Form of Security Certificate representing the 4.5% Notes due 2026, previously filed as Exhibit 4.2 to the Registrant's Current Report on Form 8-K filed with the Commission on April 8, 2016 and incorporated herein by reference.

4.10 Second Supplemental Indenture (to the Base Indenture dated as of April 8, 2016) dated as of August 24, 2020 between the Registrant, as issuer, and U.S. Bank National Association, as trustee, previously filed as Exhibit 4.2 to the Registrant's Current Report on Form 8-K filed with the Commission on August 24, 2020 and incorporated herein by reference.

4.11 Form of Security Certificate representing the 2.5% Notes due 2030, previously filed as Exhibit 4.3 (and included in Exhibit 4.2) to the Registrant's Current Report on Form 8-K filed with the Commission on August 24, 2020 and incorporated herein by reference.

4.12 Description of Registrant's Securities previously filed as Exhibit 4.12 to the Registrant's Annual Report on Form 10-K filed with the Commission on February 25, 2022 and incorporated herein by reference.

+10.1 State Mutual Life Assurance Company of America Excess Benefit Retirement Plan, previously filed as Exhibit 10.5 to the Registrant's Registration Statement on Form S-1 (No. 33-91766) filed with the Commission on May 1, 1995 and incorporated herein by reference. (P)

+10.2 The Hanover Insurance Group Cash Balance Pension Plan, as amended, previously filed as Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q filed with the Commission on October 31, 2019 and incorporated herein by reference.

+10.3 The Hanover Insurance Group Retirement Savings Plan, as amended, previously filed as Exhibit 10.3 to the Registrant's Annual Report on Form 10-K filed with the Commission on February 25, 2022 and incorporated herein by reference.

+10.4 The Hanover Insurance Group, Inc. Amended and Restated Non-Qualified Retirement Savings Plan, previously filed as Exhibit 10.30 to the Registrant's Annual Report on Form 10-K filed with the Commission on February 24, 2011 and incorporated herein by reference.

+10.5 The Hanover Insurance Group, Inc. 2006 Long-Term Incentive Plan, as amended, previously filed as Annex I to the Registrant's Definitive Proxy Statement on Schedule 14A filed with the Commission on March 29, 2012 and incorporated herein by reference.

+10.6 Form of Non-Qualified Stock Option Agreement under The Hanover Insurance Group, Inc. 2006 Long-Term Incentive Plan, previously filed as Exhibit 10.38 to the Registrant's Annual Report on Form 10-K filed with the Commission on February 26, 2013 and incorporated herein by reference.

+10.7 Amendment to outstanding Stock Options issued under The Hanover Insurance Group, Inc. 2006 Long-Term Incentive Plan, previously filed as Exhibit 10.11 to the Registrant's Annual Report on Form 10-K filed with the Commission on February 25, 2016 and incorporated herein by reference.

+10.8 The Hanover Insurance Group 2014 Long-Term Incentive Plan, previously filed as Annex I to the Registrant's Definitive Proxy Statement on Schedule 14A filed with the Commission on April 3, 2014 and incorporated herein by reference.

+10.9 Form of Non-Qualified Stock Option Agreement under The Hanover Insurance Group 2014 Long-Term Incentive Plan, previously filed as Exhibit 10.2 to the Registrant's Current Report on Form 8-K filed with the Commission on May 20, 2014 and incorporated herein by reference.

+10.10 Amendment to outstanding Stock Options issued under The Hanover Insurance Group 2014 Long-Term Incentive Plan, previously filed as Exhibit 10.18 to the Registrant's Annual Report on Form 10-K filed with the Commission on February 25, 2016 and incorporated herein by reference.

+10.11 Form of Non-Qualified Stock Option Agreement under The Hanover Insurance Group 2014 Long-Term Incentive Plan, previously filed as Exhibit 10.19 to the Registrant's Annual Report on Form 10-K filed with the Commission on February 25, 2016 and incorporated herein by reference.

+10.12 Form of Non-Qualified Stock Option Agreement under The Hanover Insurance Group 2014 Long-Term Incentive Plan for Chief Financial Officer, previously filed as Exhibit 10.2 to the Registrant's Quarterly Report on Form 10-Q filed with the Commission on November 4, 2016 and incorporated herein by reference.

+10.13 Form of Non-Qualified Stock Option Agreement under The Hanover Insurance Group 2014 Long-Term Incentive Plan, previously filed as Exhibit 10.16 to the Registrant's Annual Report on Form 10-K filed with the Commission on February 27, 2018 and incorporated herein by reference.

+10.14 Form of Non-Qualified Stock Option Agreement under The Hanover Insurance Group 2014 Long-Term Incentive Plan for Chief Financial Officer, previously filed as Exhibit 10.17 to the Registrant's Annual Report on Form 10-K filed with the Commission on February 27, 2018 and incorporated herein by reference.

+10.15 Form of Non-Qualified Stock Option Agreement under The Hanover Insurance Group 2014 Long-Term Incentive Plan, previously filed as Exhibit 10.16 to the Registrant's Annual Report on Form 10-K filed with the Commission on February 24, 2020 and incorporated herein by reference.

+10.16 Form of Non-Qualified Stock Option Agreement under The Hanover Insurance Group 2014 Long-Term Incentive Plan, previously filed as Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q filed with the Commission on May 4, 2022 and incorporated herein by reference.

+10.17 Form of Performance-Based Restricted Stock Unit Agreement under The Hanover Insurance Group 2014 Long-Term Incentive Plan, previously filed as Exhibit 10.21 to the Registrant's Annual Report on Form 10-K filed with the Commission on February 27, 2018 and incorporated herein by reference.

+10.18 Form of Performance-Based Restricted Stock Unit Agreement under The Hanover Insurance Group 2014 Long-Term Incentive Plan for Chief Financial Officer, previously filed as Exhibit 10.22 to the Registrant's Annual Report on Form 10-K filed with the Commission on February 27, 2018 and incorporated herein by reference.

+10.19 Form of Performance-Based Restricted Stock Unit Agreement under The Hanover Insurance Group 2014 Long-Term Incentive Plan, previously filed as Exhibit 10.3 to the Registrant's Quarterly Report on Form 10-Q filed with the Commission on May 4, 2022 and incorporated herein by reference.

+10.20 Form of Restricted Stock Unit Agreement under The Hanover Insurance Group 2014 Long-Term Incentive Plan, previously filed as Exhibit 10.24 to the Registrant's Annual Report on Form 10-K filed with the Commission on February 27, 2018 and incorporated herein by reference.

+10.21 Form of Restricted Stock Unit Agreement under The Hanover Insurance Group 2014 Long-Term Incentive Plan, previously filed as Exhibit 10.25 to the Registrant's Annual Report on Form 10-K filed with the Commission on February 27, 2018 and incorporated herein by reference.

+10.22 Form of Restricted Stock Unit Agreement under The Hanover Insurance Group 2014 Long-Term Incentive Plan for Chief Financial Officer, previously filed as Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q filed with the Commission on May 2, 2019 and incorporated herein by reference.

+10.23 Form of Restricted Stock Unit Agreement under The Hanover Insurance Group 2014 Long-Term Incentive Plan, previously filed as Exhibit 10.2 to the Registrant's Quarterly Report on Form 10-Q filed with the Commission on May 4, 2022 and incorporated herein by reference.

+10.24 The Hanover Insurance Group 2022 Long-Term Incentive Plan, previously filed as Annex 1 to the Registrant's Proxy Statement filed with the Commission on March 25, 2022 and incorporated herein by reference.

+10.25 Form of Non-Qualified Stock Option Agreement under The Hanover Insurance Group 2022 Long-Term Incentive Plan, previously filed as Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q filed with the Commission on August 3, 2022 and incorporated herein by reference.

+10.26 Form of Restricted Stock Unit Agreement under The Hanover Insurance Group 2022 Long-Term Incentive Plan, previously filed as Exhibit 10.2 to the Registrant's Quarterly Report on Form 10-Q filed with the Commission on August 3, 2022 and incorporated herein by reference.

+10.27 Form of Restricted Stock Unit Agreement under The Hanover Insurance Group 2022 Long-Term Incentive Plan, previously filed as Exhibit 10.3 to the Registrant's Quarterly Report on Form 10-Q filed with the Commission on August 3, 2022 and incorporated herein by reference.

+10.28 Form of Performance-Based Restricted Stock Unit Agreement under The Hanover Insurance Group 2022 Long-Term Incentive Plan, previously filed as Exhibit 10.4 to the Registrant's Quarterly Report on Form 10-Q filed with the Commission on August 3, 2022 and incorporated herein by reference.

+10.29 The Hanover Insurance Group, Inc. Amended and Restated Employment Continuity Plan, previously filed as Exhibit 10.2 to the Registrant's Quarterly Report on Form 10-Q filed with the Commission on August 11, 2008 and incorporated herein by reference.

+10.30 Form of Side Letter Agreement for New Participants in The Hanover Insurance Group, Inc. Amended and Restated Employment Continuity Plan waiving right to IRC §280G "Gross-Up" Payments, previously filed as Exhibit 10.6 to the Registrant's Quarterly Report on Form 10-Q filed with the Commission on July 29, 2016 and incorporated herein by reference.

+10.31 Description of 2019 — 2020 Non-Employee Director Compensation, previously filed as Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q filed with the Commission on August 1, 2019 and incorporated herein by reference.

+10.32 The Hanover Insurance Group, Inc. Non-Employee Director Deferral Plan, previously filed as Exhibit 10.28 to the Registrant's Annual Report on Form 10-K filed with the Commission on February 27, 2009 and incorporated herein by reference.

+10.33 Supplemental Retainer for Theodore H. Bunting, Jr., previously filed as Exhibit 10.5 to the Registrant's Quarterly Report on Form 10-Q filed with the Commission on August 3, 2022 and incorporated herein by reference.

+10.34 Offer Letter, dated September 21, 2016, by and between Jeffrey M. Farber and the Registrant, previously filed as Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed with the Commission on September 23, 2016 and incorporated herein by reference.

+10.35 The Hanover Insurance Group Second Amended and Restated 2014 Employee Stock Purchase Plan, previously filed as Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q filed with the Commission on October 28, 2020 and incorporated herein by reference.

+10.36 Form of Leadership Severance Arrangement, previously filed as Exhibit 10.40 to the Registrant's Annual Report on Form 10-K filed with the Commission on February 27, 2018 and incorporated herein by reference.

+10.37 Offer Letter, dated December 2, 2019, by and between Dennis F. Kerrigan and the Registrant, previously filed as Exhibit 10.29 to the Registrant's Annual Report on Form 10-K filed with the Commission on February 24, 2021 and incorporated herein by reference.

10.38 Form of Accident and Health Coinsurance Agreement between The Hanover Insurance Company, as Reinsurer, and First Allmerica Financial Life Insurance Company (the schedules and certain exhibits have been omitted pursuant to Item 601(b)(2) of Regulation S-K), previously filed as Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed with the Commission on August 4, 2008 and incorporated herein by reference.

10.39 Credit Agreement dated April 30, 2019, among the Registrant, as Borrower, JPMorgan Chase Bank, N.A., as administrative agent, and various other lender parties, previously filed as Exhibit 10.2 to the Registrant's Quarterly Report on Form 10-Q filed with the Commission on May 2, 2019 and incorporated herein by reference.

21 Subsidiaries of THG.

23 Consent of Independent Registered Public Accounting Firm.

24 Power of Attorney.

31.1 Certification of the Chief Executive Officer, pursuant to 15 U.S.C. 78m. 78o(d), as adopted pursuant to section 302 of the Sarbanes-Oxley Act of 2002.

31.2 Certification of the Chief Financial Officer, pursuant to 15 U.S.C. 78m, 78o(d), as adopted pursuant to section 302 of the Sarbanes-Oxley Act of 2002.

32.1 Certification of the Chief Executive Officer, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to section 906 of the Sarbanes-Oxley Act of 2002.

32.2 Certification of the Chief Financial Officer, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to section 906 of the Sarbanes-Oxley Act of 2002.

99.1 Internal Revenue Service Ruling dated April 15, 1995 previously filed as Exhibit 99.1 to the Registrant's Registration Statement on Form S-1 (No. 33-91766) filed with the Commission on May 1, 1995 and incorporated herein by reference. (P)

101 The following materials from The Hanover Insurance Group, Inc.'s Annual Report on Form 10-K for the year ended December 31, 2022 formatted in Inline eXtensible Business Reporting Language ("iXBRL"): (i) Consolidated Statements of Income for the years ended December 31, 2022, 2021 and 2020; (ii) Consolidated Statements of Comprehensive Income for the years ended December 31, 2022, 2021 and 2020; (iii) Consolidated Balance Sheets at December 31, 2022 and 2021; (iv) Consolidated Statements of Shareholders' Equity for the years ended December 31, 2022, 2021 and 2020; (v) Consolidated Statements of Cash Flows for the years ended December 31, 2022, 2021 and 2020; (vi) related notes to these consolidated financial statements; and (vii) Financial Statement Schedules.

104 The cover page from The Hanover Insurance Group Inc.'s Annual Report on Form 10-K for the year ended December 31, 2022, formatted in iXBRL (embedded within EX-101).

+ Management contract or compensatory plan or arrangement.

(P) Paper exhibits.

ITEM 16 – FORM 10-K SUMMARY

None.

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.

THE HANOVER INSURANCE GROUP, INC.
Registrant

Date: February 23, 2023

By: **/S/ JOHN C. ROCHE**
John C. Roche,
President, Chief Executive Officer and Director

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.

Date: February 23, 2023	By:	**/S/ JOHN C. ROCHE** **John C. Roche,** **President, Chief Executive Officer and Director**
Date: February 23, 2023	By:	**/S/ JEFFREY M. FARBER** **Jeffrey M. Farber,** **Executive Vice President and Chief Financial Officer**
Date: February 23, 2023	By:	**/S/ WARREN E. BARNES** **Warren E. Barnes,** **Senior Vice President, Corporate Controller** **Principal Accounting Officer**
Date: February 23, 2023	By:	* **Francisco A. Aristeguieta,** **Director**
Date: February 23, 2023	By:	* **Kevin J. Bradicich,** **Director**
Date: February 23, 2023	By:	* **Theodore H. Bunting, Jr.,** **Director**
Date: February 23, 2023	By:	* **Jane D. Carlin,** **Director**
Date: February 23, 2023	By:	* **J. Paul Condrin III,** **Director**
Date: February 23, 2023	By:	* **Cynthia L. Egan,** **Chair of the Board**
Date February 23, 2023	By:	* **Martin P. Hughes,** **Director**
Date: February 23, 2023	By:	* **Wendell J. Knox,** **Director**
Date: February 23, 2023	By:	* **Kathleen S. Lane,** **Director**
Date: February 23, 2023	By:	* **Joseph R. Ramrath,** **Director**
Date: February 23, 2023	By:	* **Harriett "Tee" Taggart,** **Director**
Date: February 23, 2023	By:	* **Elizabeth A. Ward,** **Director**
Date: February 23, 2023	*By:	**/S/ JEFFREY M. FARBER** **Jeffrey M. Farber,** **Attorney-in-fact**

SCHEDULE I

THE HANOVER INSURANCE GROUP, INC.

SUMMARY OF INVESTMENTS – OTHER THAN INVESTMENTS IN RELATED PARTIES

DECEMBER 31, 2022
(in millions)

Type of investment	Cost [1]	Fair Value	Amount at which shown in the balance sheet [2]
Fixed maturities:			
Bonds:			
U.S. Government and government agencies and authorities	$ 1,590.1	$ 1,394.2	$ 1,394.2
States, municipalities and political subdivisions	1,239.5	1,076.1	1,076.1
Foreign governments	2.3	2.2	2.2
Public utilities	325.7	296.3	296.3
All other corporate bonds	5,139.0	4,713.0	4,713.0
Total fixed maturities	8,296.6	7,481.8	7,481.8
Equity securities:			
Common stocks:			
Public utilities	33.3	54.3	54.3
Banks, trusts and insurance companies	46.6	50.2	50.2
Industrial, miscellaneous and all other	74.1	131.0	131.0
Nonredeemable preferred stock	1.0	6.4	6.4
Total equity securities	155.0	241.9	241.9
Mortgage loans on real estate	391.8	357.3	388.6
Other long-term investments	351.1	397.5	397.5
Total investments	$ 9,194.5	$ 8,478.5	$ 8,509.8

(1) Original cost of equity securities and, as to fixed maturities, original cost reduced by repayments and adjusted for amortization of premiums and accretion of discounts.
(2) Mortgage loans on real estate are shown on the balance sheet net of the allowance for credit losses.

SCHEDULE II

THE HANOVER INSURANCE GROUP, INC.

CONDENSED FINANCIAL INFORMATION OF REGISTRANT

PARENT COMPANY ONLY

STATEMENTS OF INCOME AND COMPREHENSIVE INCOME

YEARS ENDED DECEMBER 31 *(in millions)*	2022	2021	2020
Revenues			
Net investment income	**$ 9.0**	$ 8.7	$ 10.7
Net realized gains (losses) from sales and other	**(1.2)**	1.2	0.4
Other income	**0.4**	—	—
Total revenues	**8.2**	9.9	11.1
Expenses			
Interest expense	**34.0**	34.0	37.0
Employee benefit related expenses	**2.7**	1.5	2.3
Interest expense on loan from subsidiary	**6.9**	6.9	7.0
Loss from repayment of debt	—	—	6.2
Other operating expenses	**6.8**	5.8	9.8
Total expenses	**50.4**	48.2	62.3
Net loss before income taxes and equity in income of subsidiaries	**(42.2)**	(38.3)	(51.2)
Income tax benefit	**13.6**	16.4	22.1
Equity in income of subsidiaries	**144.6**	440.6	387.2
Income from continuing operations	**116.0**	418.7	358.1
Income from discontinued life business (net of income tax benefit of $0.5 in 2020)	—	—	0.6
Net income	**116.0**	418.7	358.7
Other comprehensive income (loss), net of tax	**(827.7)**	(250.3)	219.9
Comprehensive income (loss)	**$ (711.7)**	$ 168.4	$ 578.6

The condensed financial information should be read in conjunction with the consolidated financial statements and notes thereto.

SCHEDULE II (CONTINUED)

THE HANOVER INSURANCE GROUP, INC.

CONDENSED FINANCIAL INFORMATION OF REGISTRANT

PARENT COMPANY ONLY

BALANCE SHEETS

DECEMBER 31	2022	2021
(in millions, except per share data)		
Assets		
Fixed maturities - at fair value (amortized cost of $310.3 and $354.6)	**$ 290.3**	$ 356.7
Equity securities - at fair value	**1.1**	1.2
Cash and cash equivalents	**43.2**	21.4
Investments in subsidiaries	**2,890.1**	3,665.2
Net receivable from subsidiaries	**26.2**	26.0
Current income tax receivable	**2.1**	6.7
Other assets	**2.7**	2.6
Total assets	**$ 3,255.7**	$ 4,079.8
Liabilities		
Expenses and state taxes payable	**$ 12.4**	$ 18.0
Interest payable	**10.3**	10.3
Debt	**907.4**	906.6
Total liabilities	**930.1**	934.9
Shareholders' Equity		
Preferred stock, par value $0.01 per share; 20.0 million shares authorized; none issued	**—**	—
Common stock, par value $0.01 per share; 300.0 million shares authorized; 60.5 million shares issued	**0.6**	0.6
Additional paid-in capital	**1,913.1**	1,887.2
Accumulated other comprehensive income (loss)	**(705.5)**	122.2
Retained earnings	**2,988.8**	2,983.2
Treasury stock at cost (24.9 and 25.0 million shares)	**(1,871.4)**	(1,848.3)
Total shareholders' equity	**2,325.6**	3,144.9
Total liabilities and shareholders' equity	**$ 3,255.7**	$ 4,079.8

The condensed financial information should be read in conjunction with the consolidated financial statements and notes thereto.

SCHEDULE II (CONTINUED)

THE HANOVER INSURANCE GROUP, INC.

CONDENSED FINANCIAL INFORMATION OF REGISTRANT

PARENT COMPANY ONLY

STATEMENTS OF CASH FLOWS

YEARS ENDED DECEMBER 31 *(in millions)*	2022	2021	2020
Cash flows from operating activities			
Net income	**$ 116.0**	$ 418.7	$ 358.7
Adjustments to reconcile net income to net cash provided by operating activities:			
Net realized investment (gains) losses	**1.2**	(1.2)	(0.4)
Net loss from repayment of debt	**—**	—	6.2
Equity in net income of subsidiaries	**(144.6)**	(440.6)	(387.2)
Dividends received from subsidiaries	**12.2**	89.5	60.3
Deferred income tax benefit	**(2.5)**	(2.0)	(8.5)
Change in expenses and taxes payable	**4.7**	(14.1)	5.6
Change in net receivable from subsidiaries	**18.3**	16.9	15.5
Other, net	**3.2**	4.8	4.4
Net cash provided by operating activities	**8.5**	72.0	54.6
Cash flows from investing activities			
Proceeds from disposals and maturities of fixed maturities	**155.0**	238.7	166.6
Purchase of fixed maturities	**(15.3)**	(60.6)	(32.4)
Net cash provided by investing activities	**139.7**	178.1	134.2
Cash flows from financing activities			
Proceeds from exercise of employee stock options	**13.3**	20.5	6.3
Proceeds from debt borrowings, net	**—**	—	296.4
Dividends paid to shareholders	**(108.9)**	(102.2)	(99.5)
Repayment of debt	**—**	—	(175.8)
Repurchases of common stock	**(30.8)**	(162.6)	(212.8)
Net cash used in financing activities	**(126.4)**	(244.3)	(185.4)
Net change in cash and cash equivalents	**21.8**	5.8	3.4
Cash and cash equivalents, beginning of year	**21.4**	15.6	12.2
Cash and cash equivalents, end of year	**$ 43.2**	$ 21.4	$ 15.6

Included in other operating cash flows was the cash portion of dividends received from unconsolidated subsidiaries. Additionally, investment assets of $98.8 million, $166.0 million and $185.6 million were transferred to the parent company in 2022, 2021 and 2020, respectively, to settle dividend obligations and other intercompany borrowings and balances.

The condensed financial information should be read in conjunction with the consolidated financial statements and notes thereto.

SCHEDULE III

THE HANOVER INSURANCE GROUP, INC.

SUPPLEMENTARY INSURANCE INFORMATION

DECEMBER 31, 2022
(in millions)

Segments	Deferred acquisition costs	Future policy benefits, losses, claims and loss expenses	Unearned premiums	Other policy claims and benefits payable	Premium revenue	Net investment income (1)	Benefits, claims, losses and settlement expenses	Amortization of deferred acquisition costs	Other operating expenses (2)	Premiums written
Core Commercial	$ 212.6	$ 3,344.9	$ 1,016.9	$ 6.0	$ 1,950.5	$ 136.2	$ 1,336.5	$ 417.7	$ 229.6	$ 1,999.9
Specialty	188.3	1,592.6	747.9	5.5	1,189.0	62.1	641.8	303.9	124.8	1,243.7
Personal Lines	203.9	1,998.1	1,189.4	—	2,112.8	86.8	1,643.9	371.6	207.0	2,232.9
Other	—	65.5	—	—	—	11.2	1.2	—	20.3	—
Interest on Debt	—	—	—	—	—	—	—	—	34.1	—
Eliminations	—	—	—	—	—	—	—	—	(7.8)	—
Total	$ 604.8	$ 7,001.1	$ 2,954.2	$ 11.5	$ 5,252.3	$ 296.3	$ 3,623.4	$ 1,093.2	$ 608.0	$ 5,476.5

DECEMBER 31, 2021
(in millions)

Segments	Deferred acquisition costs	Future policy benefits, losses, claims and loss expenses	Unearned premiums	Other policy claims and benefits payable	Premium revenue	Net investment income (1)	Benefits, claims, losses and settlement expenses	Amortization of deferred acquisition costs	Other operating expenses (2)	Premiums written
Core Commercial	$ 197.6	$ 2,986.5	$ 964.9	$ 4.5	$ 1,810.9	$ 146.5	$ 1,220.1	$ 380.0	$ 222.6	$ 1,864.8
Specialty	172.4	1,516.9	702.6	5.1	1,029.9	62.9	591.1	261.2	115.0	1,118.9
Personal Lines	182.0	1,868.4	1,067.4	—	1,929.4	89.4	1,322.0	341.5	206.5	2,009.7
Other	—	66.2	—	—	—	11.9	1.0	—	18.8	—
Interest on Debt	—	—	—	—	—	—	—	—	34.0	—
Eliminations	—	—	—	—	—	—	—	—	(7.3)	—
Total	$ 552.0	$ 6,438.0	$ 2,734.9	$ 9.6	$ 4,770.2	$ 310.7	$ 3,134.2	$ 982.7	$ 589.6	$ 4,993.4

DECEMBER 31, 2020
(in millions)

Segments	Deferred acquisition costs	Future policy benefits, losses, claims and loss expenses	Unearned premiums	Other policy claims and benefits payable	Premium revenue	Net investment income (1)	Benefits, claims, losses and settlement expenses	Amortization of deferred acquisition costs	Other operating expenses (2) (3)	Premiums written
Core Commercial	$ 170.1	$ 2,723.2	$ 876.9	$ 3.8	$ 1,703.7	$ 124.2	$ 1,076.7	$ 367.7	$ 210.3	$ 1,726.2
Specialty	142.0	1,317.8	637.0	4.8	979.6	51.1	570.9	250.7	117.5	1,006.9
Personal Lines	165.4	1,907.8	968.8	—	1,844.1	76.7	1,193.3	332.6	193.7	1,865.4
Other	—	66.6	—	—	—	13.1	4.3	—	31.4	—
Interest on Debt	—	—	—	—	—	—	—	—	37.1	—
Eliminations	—	—	—	—	—	—	—	—	(6.2)	—
Total	$ 477.5	$ 6,015.4	$ 2,482.7	$ 8.6	$ 4,527.4	$ 265.1	$ 2,845.2	$ 951.0	$ 583.8	$ 4,598.5

(1) The Company manages investment assets for its Core Commercial, Specialty, Personal Lines and Other segments on a combined basis, based on the requirements of its combined insurance companies. Net investment income is allocated to these segments based on actuarial information related to the underlying businesses.

(2) For other operating expenses that are not directly attributable to a single segment, expenses are generally allocated based upon either net premiums written or net premiums earned.

(3) In 2020, the Other segment includes $6.2 million of losses from the repayment of debt.

SCHEDULE IV

THE HANOVER INSURANCE GROUP, INC.

REINSURANCE

Incorporated herein by reference to Note 13 — “Reinsurance” in the Notes to Consolidated Financial Statements.

SCHEDULE V

THE HANOVER INSURANCE GROUP, INC.

VALUATION AND QUALIFYING ACCOUNTS

DECEMBER 31

(in millions) Description	*Balance at beginning of period*	*Additions (Charged to costs and expenses)*	*Deductions*	*Balance at end of period*
2022				
Allowance for doubtful accounts	**$ 6.3**	**$ 10.9**	**$ (11.0)**	**$ 6.2**
Allowance for uncollectible reinsurance recoverables	**8.9**	**—**	**(1.0)**	**7.9**
	$ 15.2	**$ 10.9**	**$ (12.0)**	**$ 14.1**
2021				
Allowance for doubtful accounts	$ 9.3	$ 10.1	$ (13.1)	$ 6.3
Allowance for uncollectible reinsurance recoverables	6.6	2.3	—	8.9
	$ 15.9	$ 12.4	$ (13.1)	$ 15.2
2020				
Allowance for doubtful accounts	$ 3.5	$ 16.9	$ (11.1)	$ 9.3
Allowance for uncollectible reinsurance recoverables	3.9	2.7	—	6.6
	$ 7.4	$ 19.6	$ (11.1)	$ 15.9

SCHEDULE VI

THE HANOVER INSURANCE GROUP, INC.

SUPPLEMENTAL INFORMATION CONCERNING PROPERTY AND CASUALTY INSURANCE OPERATIONS

YEARS ENDED DECEMBER 31
(in millions)

Affiliation with Registrant	*Deferred acquisition costs*	*Reserves for unpaid claims and claim adjustment expenses* [1]	*Discount, if any, deducted from previous column* [2]	*Unearned premiums* [1]
Consolidated Property and Casualty Subsidiaries				
2022	**$ 604.8**	**$ 7,012.6**	**$ —**	**$ 2,954.2**
2021	$ 552.0	$ 6,447.6	$ —	$ 2,734.9

	Earned premiums	*Net investment income*	*Claims and claim adjustment expenses incurred related to*		*Amortization of deferred acquisition costs*	*Paid claims and claim adjustment expenses*	*Premiums written*
			Current year	*Prior years*			
2022	**$ 5,252.3**	**$ 296.3**	**$ 3,656.0**	**$ (32.6)**	**$ 1,093.2**	**$ 3,113.2**	**$ 5,476.5**
2021	$ 4,770.2	$ 310.7	$ 3,205.3	$ (71.1)	$ 982.7	$ 2,762.8	$ 4,993.4
2020	$ 4,527.4	$ 265.1	$ 2,877.8	$ (32.6)	$ 951.0	$ 2,542.4	$ 4,598.5

(1) Reserves for unpaid claims and claim adjustment expenses are shown gross of $1,748.6 million and $1,693.8 million of reinsurance recoverable on unpaid losses in 2022 and 2021, respectively. Unearned premiums are shown gross of prepaid premiums of $104.9 million and $113.1 million in 2022 and 2021, respectively. Reserves for unpaid claims and claims adjustment expense also include policyholder dividends.

(2) The Company does not use discounting techniques.

[THIS PAGE INTENTIONALLY LEFT BLANK]

[THIS PAGE INTENTIONALLY LEFT BLANK]

[THIS PAGE INTENTIONALLY LEFT BLANK]

ENDNOTES

(1) Operating income and operating income per diluted share are non-GAAP measures. The following is a reconciliation of operating income and operating income per diluted share to the closest GAAP measures, income from continuing operations and income from continuing operations per diluted share, respectively, to net income and net income per diluted share, respectively.

	YEARS ENDED			
	Dec. 31, 2021		Dec. 31, 2022	
($ in millions, except per share data)	$ Amount	Per Share Diluted	$ Amount	Per Share Diluted
OPERATING INCOME (LOSS)				
Core Commercial	$138.0		$106.9	
Specialty	131.9		186.0	
Personal Lines	158.5		(8.8)	
Other	3.9		1.0	
Total	432.3		285.1	
Interest expense	(34.0)		(34.1)	
Operating income before income taxes	398.3	$10.93	251.0	$6.95
Income tax expense on operating income	(80.0)	(2.20)	(51.1)	(1.42)
Operating income after income taxes	318.3	8.73	199.9	5.53
Non-operating items:				
Net realized gains (losses) from sales and other	4.6	0.13	(26.5)	(0.73)
Net change in fair value of equity securities	119.1	3.27	(63.3)	(1.75)
Recoveries (impairments) on investments:				
Credit-related recoveries (impairments)	0.3	0.01	(1.9)	(0.05)
Losses on intent to sell securities	(1.0)	(0.03)	(14.8)	(0.41)
	(0.7)	(0.02)	(16.7)	(0.46)
Other non-operating items	-	-	(0.5)	(0.02)
Income tax benefit (expense) on non-operating items	(21.3)	(0.59)	23.9	0.66
Income from continuing operations, net of taxes	420.0	11.52	116.8	3.23
Discontinued operations (net of taxes):				
Income from Chaucer business	1.2	0.03	-	-
Loss from discontinued life businesses	(2.5)	(0.06)	(0.8)	(0.02)
Net income	$418.7	$11.49	$116.0	$3.21
Dilutive weighted average shares outstanding		36.4		36.1

(2) Total shareholders' equity, excluding net unrealized appreciation (depreciation) on fixed maturity investments, net of tax, is a non-GAAP measure. Total shareholders' equity is the most directly comparable GAAP measure. The following is a reconciliation of GAAP shareholders' equity to shareholders' equity, excluding net unrealized appreciation (depreciation) on fixed maturity investments, net of tax.

	PERIODS ENDED				
($ in millions)	Dec. 31, 2021	Mar. 31, 2022	Jun. 30, 2022	Sep. 30, 2022	Dec. 31, 2022
Total shareholders' equity (GAAP)	$3,144.9	$2,832.8	$2,571.8	$2,295.9	$2,325.6
Less: net unrealized appreciation (depreciation) on fixed maturity investments, net of tax	184.9	(195.0)	(459.4)	(706.7)	(641.4)
Total shareholders' equity, excluding net unrealized appreciation (depreciation) on fixed maturity investments, net of tax	$2,960.0	$3,027.8	$3,031.2	$3,002.6	$2,967.0
Average shareholders' equity (GAAP)					$2,634.2
Average shareholders' equity, excluding net unrealized appreciation (depreciation) on fixed maturity investments, net of tax					$2,997.7

(3) Book value per share, excluding net unrealized appreciation (depreciation) on fixed maturity investments, net of tax, is a non-GAAP measure. Book value per share is the most directly comparable GAAP measure and is reconciled in the table below.

	YEARS ENDED				
	Dec. 31, 2018	Dec. 31, 2019	Dec. 31, 2020	Dec. 31, 2021	Dec. 31, 2022
Book value per share (GAAP)	$69.81	$75.94	$87.96	$88.59	$65.38
Less: Net unrealized appreciation (depreciation) on fixed maturity investments, net of tax, per share	(0.65)	5.62	11.76	5.21	(18.03)
Book value per share, excluding net unrealized appreciation (depreciation) on fixed maturity investments, net of tax (non-GAAP)	$70.46	$70.32	$76.20	$83.38	$83.41

(4) Combined ratio, excluding catastrophe losses, is a non-GAAP measure. The combined ratio (which includes catastrophe losses and prior-year loss reserve development) is the most directly comparable GAAP measure. The following is a reconciliation of the GAAP combined ratio to the combined ratio, excluding catastrophes.

	YEARS ENDED				
	Dec. 31, 2018	Dec. 31, 2019	Dec. 31, 2020	Dec. 31, 2021	Dec. 31, 2022
Total combined ratio (GAAP)	96.1%	95.6%	94.4%	97.0%	99.8%
Less: catastrophe loss ratio	5.2%	3.8%	6.3%	8.4%	7.7%
Combined ratio, excluding catastrophe losses (non-GAAP)	90.9%	91.8%	88.1%	88.6%	92.1%

(5) The expense ratio is reduced by installment fee and other revenues for purposes of the calculation.

(6) Operating return on average equity ("operating ROE") is a non-GAAP measure. Operating ROE is calculated by dividing operating income after income taxes for the applicable period (end note (1)), by average shareholders' equity, excluding unrealized appreciation (depreciation) on fixed maturity investments, net of tax, for the period presented (end note (2)). Operating ROE should not be construed as a substitute for GAAP ROE. See calculations in the following table, including the calculation of ROE using net income and average shareholders' equity without adjustments.

($ in millions)	YEAR ENDED
NET INCOME ROE (GAAP)	Dec. 31, 2022
Net income	$116.0
Average shareholders' equity	2,634.2
Return on equity	4.4%
OPERATING INCOME ROE (non-GAAP)	
Operating income, net of tax (end note (1))	$199.9
Average shareholders' equity, excluding net unrealized appreciation (depreciation) on fixed maturity investments, net of tax (endnote (2))	2,997.7
Operating return on equity	6.7%

REGISTRAR AND STOCK TRANSFER AGENT

Computershare Investor Services

P.O. Box 43006

Providence, RI 02940-3006

800-317-4454

INDEPENDENT ACCOUNTANTS

PricewaterhouseCoopers LLP

101 Seaport Boulevard

Suite 500

Boston, MA 02210

CORPORATE OFFICE

The Hanover Insurance Group, Inc.

440 Lincoln Street

Worcester, MA 01653

508-855-1000

PRINCIPAL SUBSIDIARIES

The Hanover Insurance Company

440 Lincoln Street

Worcester, MA 01653

Citizens Insurance Company of America

808 North Highlander Way

Howell, MI 48843

FINANCIAL STRENGTH RATINGS*

	A.M. BEST	S&P GLOBAL	MOODY'S
The Hanover Insurance Company	A	A	A2
Citizens Insurance Company of America	A	A	–

DEBT RATING*

THE HANOVER INSURANCE GROUP, INC.	A.M. BEST	S&P GLOBAL	MOODY'S
Senior Debt	bbb+	BBB	Baa2
Subordinated Debentures	bbb-	BB+	Baa3

* The above ratings are accurate as of March 17, 2023, and may be revised, superseded or withdrawn by the respective rating agency at any time. For the most current information concerning the financial ratings of The Hanover Insurance Group, Inc. and its subsidiaries, please visit the websites of the respective rating agencies.

INVESTOR INFORMATION

For more information, including our annual report on Form 10-K and our quarterly reports on Form 10-Q and other documents filed with the Securities and Exchange Commission, please visit our website at hanover.com under "Investors." Alternatively, investors may address questions to:

Oksana Lukasheva
Senior Vice President, Corporate Finance
The Hanover Insurance Group, Inc.
olukasheva@hanover.com

ABOUT THE HANOVER

The Hanover Insurance Group, Inc. is the holding company for several property and casualty insurance companies, which together constitute one of the largest insurance businesses in the United States. The company provides a broad array of insurance solutions through a select group of independent agents and brokers. Together with its agents, the company offers standard and specialized insurance protection for small and mid-sized businesses, as well as for homes, automobiles, and other personal items. For more information, please visit hanover.com.

ANNUAL MEETING OF SHAREHOLDERS

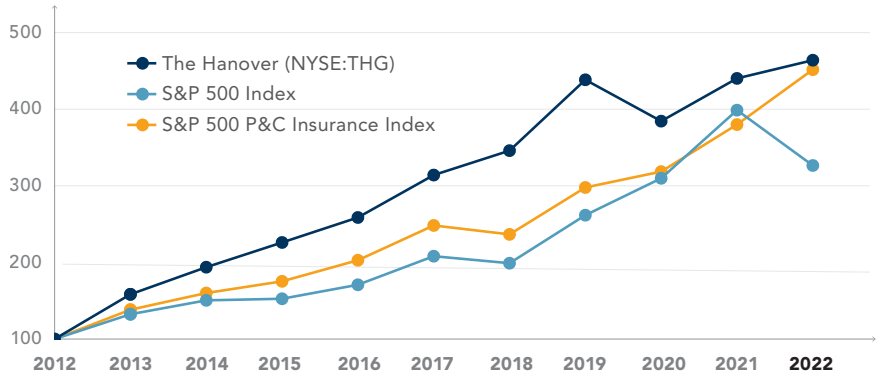
The management and Board of Directors of The Hanover Insurance Group, Inc. cordially invite shareholders to attend the company's Annual Meeting of Shareholders. The meeting will be held on Tuesday, May 9, 2023, at 9:00 a.m. eastern time, at the company's headquarters located at 440 Lincoln Street in Worcester, Massachusetts.

CORPORATE GOVERNANCE AND RESPONSIBILITY

Our Corporate Governance Guidelines, Board committee charters, Code of Conduct, and other company policies and information are available on our website at hanover.com, under "Why The Hanover—Our Governance." For a printed copy of any of these documents, shareholders may contact the company's secretary at our corporate offices.

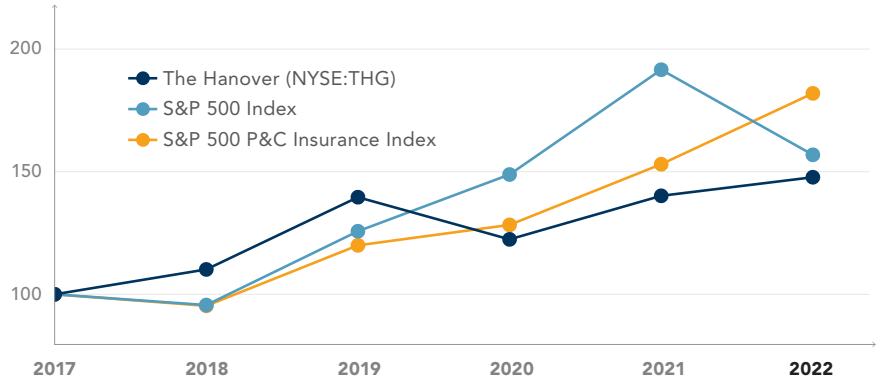
The company has filed its CEO and CFO Section 302 certificates as exhibits to its Annual Report on Form 10-K for the year ended December 31, 2022. In 2022, the company also submitted its annual CEO certification to the New York Stock Exchange.

TEN-YEAR TOTAL RETURN PERFORMANCE**



**The graph above compares the performance of the company's common stock since December 31, 2012, with the performance of the S&P 500 Property and Casualty Insurance Index and the S&P 500 Index. Assumes $100 invested on December 31, 2012, in The Hanover Insurance Group, Inc.'s stock or applicable index, including reinvestment of dividends. Source: S&P Global Market Intelligence ©2022

FIVE-YEAR TOTAL RETURN PERFORMANCE***



*** The graph above compares the performance of the company's common stock since December 31, 2017, with the performance of the S&P 500 Property and Casualty Insurance Index and the S&P 500 Index. Assumes $100 invested on December 31, 2017, in The Hanover Insurance Group, Inc.'s stock or applicable index, including reinvestment of dividends. Source: S&P Global Market Intelligence ©2022

COMMON STOCK

The common stock of The Hanover Insurance Group, Inc. is traded on the New York Stock Exchange under the symbol "THG." As of the close of business on March 17, 2023, the company had approximately 14,151 shareholders of record. On the same date, the closing price of the company's common stock was $121.57 per share.

COMMON STOCK PRICES

2022	HIGH	LOW
First Quarter	$150.95	$131.19
Second Quarter	$154.28	$136.34
Third Quarter	$148.36	$124.89
Fourth Quarter	$147.47	$131.27

2021	HIGH	LOW
First Quarter	$133.12	$112.47
Second Quarter	$142.80	$129.83
Third Quarter	$142.35	$127.33
Fourth Quarter	$136.97	$121.75

The Hanover Insurance Group®

The Hanover Insurance Company
440 Lincoln Street, Worcester, MA 01653

hanover.com

07148 (3/23)

©2023 The Hanover Insurance Group, Inc.