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SCENARIO TESTING OUR MUTUAL FUTURE

NAMIC®
ISSUE ANALYSIS

NATIONAL ASSOCIATION OF MUTUAL INSURANCE COMPANIES

The National Association of Mutual Insurance Companies is the largest property/casualty insurance trade group with a diverse membership of more than 1,500 local, regional, and national member companies, including seven of the top 10 property/casualty insurers in the United States. NAMIC members lead the personal lines sector representing 66 percent of the homeowner's insurance market and 53 percent of the auto market.

Through our advocacy programs we promote public policy solutions that benefit NAMIC member companies and the policyholders they serve and foster greater understanding and recognition of the unique alignment of interests between management and policyholders of mutual companies.

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Guy Carpenter & Company, LLC is a leading global risk and reinsurance specialist with more than 3,300 professionals in over 60 offices around the world. Guy Carpenter delivers a powerful combination of broking expertise, trusted strategic advisory services and industry-leading analytics to help clients adapt to emerging opportunities and achieve profitable growth. Guy Carpenter is a business of Marsh McLennan (NYSE: MMC), the world's leading professional services firm in the areas of risk, strategy and people. The company's 81,000 colleagues advise clients in over 130 countries. With annual revenue of $19 billion, Marsh McLennan helps clients navigate an increasingly dynamic and complex environment through four market-leading businesses including Marsh, Mercer and Oliver Wyman. For more information, visit www.guycarp.com and follow Guy Carpenter on LinkedIn and Twitter @GuyCarpenter.

For more information about this NAMIC Issue Analysis please visit www.namic.org/issues/our-positions or contact:

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FOREWARD

In a world forever changed by the COVID-19 pandemic, mutual property/casualty insurance companies of all sizes are facing increasing pressure from stakeholders to consider the impact of systemic scenario testing on their financial forecasts. Understanding how the many different scenario tests can impact their financial performance is critical to their long-term strength and stability, which, in turn, is critical to each mutual company's ability to serve its policyholders.

In support of this consideration, NAMIC and Guy Carpenter have collaborated to develop a series of reports designed to measure the exposure of each U.S. property/casualty (P/C) insurance company to a set of pre-defined operating environments. From 2021 through 2023, the two will investigate how various scenarios, expected and unexpected, will impact mutual companies.

To help contextualize the analysis for NAMIC member companies during this three-year period, NAMIC has defined cohorts of companies based on company structure, size, business profile, and regional footprint. This prospectively focused research is designed to arm companies with information on a range of "what if?" scenarios and position them to compare the impact on their own financial performance to that of their peers. The 2021 report and subsequent updates summarize industry and segment-level results and provide readers practical guidance on how to use these scenarios tests to help better measure, manage, and mitigate risk.

This critically important research is expected to provide a realistic assessment of the potential impact of adverse scenarios on profitability and solvency at the industry and company level for every active U.S. P/C statutory entity.

EXECUTIVE SUMMARY

Risk quite literally is the business of P/C insurers. In exchange for a premium, insurers assume significant notional exposure on every policy written. In addition to this underwriting risk, insurers hold investment assets, which can experience considerable volatility in market value. To grow and protect capital over the long term, it isn't enough to just price each policy appropriately at the time of binding; it also requires a holistic strategy for measuring aggregate exposure across the enterprise and mitigating the chance of any single event leading to a significant drawdown in surplus. To measure exposure across a portfolio of assets and liabilities, many insurers utilize sophisticated capital modeling tools that simulate performance in a range of potential future operating environments. Despite the best efforts of modelers and management teams, events sometimes arise that are outside the range of possibilities contemplated to date. The global COVID-19 pandemic is one such event, the impact of which is still being measured and felt today. This report outlines an approach for combining stochastic capital modeling with discrete scenario testing, which represent potential future events or operating environments, to better understand how well positioned the industry is today to weather these challenges. This research will be updated periodically to ensure the risk measurements provided remain timely and relevant, with new scenarios added as the market landscape changes.

Scenario Tests	**Loss to Industry** ($B)	**Loss for Mutuals** ($B)
Inflation	75	23
Recession	135	59
Cyber	8	2
SCS	2	1
Reinsurance	16	3

Chart 1. Count of companies by Mean ROS (%) for baseline model and five scenario tests

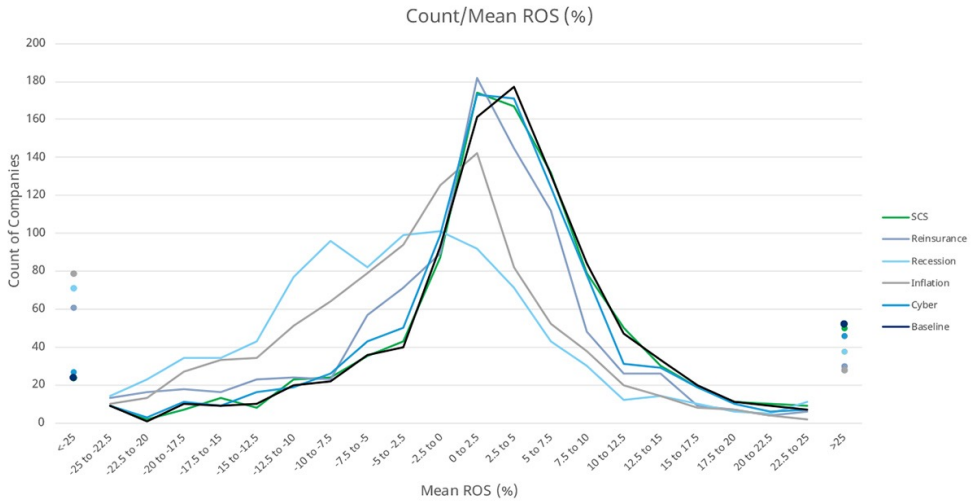


Chart note: Count of companies with return on surplus less than -25% or greater than 25% is shown with corresponding dots on chart to indicate the tail aggregation.
Chart note 2: Mean ROS is defined as mean modeled 2021 change in surplus before impact of dividends or change in paid in capital, expressed as a percentage of year-end 2020 policyholder surplus.

Table 1. Proportion of all companies experiencing loss on surplus by scenario

ROS	Baseline	SCS	Cyber	Reinsurance	Inflation	Recession
< 0%	27%	27%	31%	41%	61%	67%
< -10%	8%	9%	9%	17%	25%	29%
< -25%	2%	2%	3%	6%	8%	7%

Table 2. Proportion of mutuals experiencing loss on surplus by scenario

ROS	Baseline	SCS	Cyber	Reinsurance	Inflation	Recession
< 0%	24%	25%	29%	34%	59%	76%
< -10%	5%	6%	6%	9%	19%	33%
< -25%	1%	1%	1%	2%	4%	7%

The most important takeaway from this research is that as of today, the U.S. P/C industry is strongly capitalized, with a large majority of insurance companies well positioned to survive even severe stress. For most companies, a harsh recession is the driver of the biggest reduction in surplus. As a result of the bull market in risk assets that has persisted since the 2008 financial crisis, the level of equities and other risk assets on insurers' balance sheets is the highest it's been in at least the last 25 years – for every dollar of statutory surplus on insurers' balance sheets at year-end 2020, 79 cents was invested into public or private equity. This equals 36% of the total cash and invested assets held by the U.S. P/C Insurance industry. For reference, at year-end 2007, just before the sub-prime financial crisis, only 25% of insurers' invested assets were in equity securities. A similar market drawdown in the coming years would have a significantly greater impact on insurer financials than

even the 2008 financial crisis. Mutual companies in particular should monitor their asset exposure carefully, as the scenario testing shows the typical mutual insurer is more exposed to recession risk than an average stock company.

Among those modeled, the next most impactful scenario facing the industry was a sudden spike in inflation. This scenario was particularly severe for companies writing long-tail commercial lines with years of accumulated reserves on the balance sheet. Though the impact was slightly less severe than that of a recession, for the industry as a whole, it results in a greater number of companies facing inviability or outright insolvency. As companies navigate through an environment of historically low yields and quickly rising price inflation across a variety of goods and services, it is critical to re-evaluate exposure to risk of loss costs trending more adversely than planned.

To help understand trends in modeling results across companies, this study used predictive modeling to determine what the greatest indicator would be of a company having high expected volatility and low expected return. Very high reserve leverage was the single most predictive characteristic for company underperformance. In the past periods of reserve strengthening, many carriers were able to absorb the hit to surplus gradually over several reporting years. If a sudden change in claims costs makes a gradual approach to loss recognition unfeasible, many carriers could see significant pressure on their surplus and ratings.

Increased frequency and severity trends in severe convective storm (SCS) activity are scenarios that might reasonably be expected to pose major capital impact for exposed carriers. The authors were surprised to find that even a significant amplification of modeled SCS activity did not materially impact risk profile for the vast majority of companies. The scenario was based on projecting forward the trends observed in more than 60 years of meteorological data and resulted in an industrywide increase in gross annual average insured severe convective storm losses of USD 2.3 billion. Of these additional losses, carriers' in-force catastrophe reinsurance programs are expected to absorb USD 300 million to 350 million.

These are annual average costs, and the increases in high storm activity years were significantly greater, but also more disproportionately retained by reinsurers than primary carriers. The impact of the SCS scenario on the 1:100 convective storm year is expected to be USD 6.4 billion higher gross loss versus the baseline, which after catastrophe reinsurance would net to USD 3.6 billion of additional retained catastrophe losses. As catastrophe model vendors and reinsurers begin to adjust their expectations for the SCS peril, reinsurance cost may be adjusted to reflect this increased exposure, which will put pressure on carriers to price for true convective storm risk more precisely on a policy-by-policy level.

The quantity and variety of large losses incurred by P/C insurers has significantly reduced returns on deployed capital for the reinsurance industry in total. A multi-year soft market in the mid-2010s reduced rate levels for coverage in many reinsurance markets to near historic lows. Since then, there has been a sudden increase in ceded losses over the past several years, including the emergence of insured perils such as wildfire and cyber.

In response to continued pressure on profitability, AM Best (Best) has warned that companies should consider scenario testing that reflects an increase in the market price of reinsurance capacity. This scenario would test the performance of stock companies significantly more than mutuals in most circumstances. Often, smaller and midsize companies are more dependent on reinsurance to hedge their risk and may not have sufficient capital to maintain operations without continuing to buy cover at higher rates. Companies operating in the southeastern part of the country are also often highly dependent on reinsurance and will be subject to pressure to push the added reinsurance cost over time to the policyholders, if regulators will allow it.

Carriers should treat a systemic cyber event impacting a large number of exposures as not a question of "if" but "when."

Awareness of cyber risk faced by companies has grown significantly. From 2015 to 2020, the U.S. market for affirmative cyber insurance has tripled, from USD 1 billion to USD 3 billion, and it continues to grow by more than 30% year-over-year through the first half of 2021. Insurers must manage their exposure to three main types of cyber risks: affirmative, silent, and operational.[1] Silent cyber risks in particular present unique risks to insurers due to potential ambiguities in coverage language, resulting in unintended cover. As reinsurers across lines have moved quickly to exclude cyber in the All Other Perils cover, it is incumbent on companies' legal, underwriting, and management teams to ensure no coverage gap exists between their primary policies and reinsurance protection. There is little doubt this risk will continue to evolve and grow as the multinational backdrop grows increasingly interconnected. Carriers should treat the threat of a systemic cyber catastrophe event impacting a large number of exposures as not a question of "if" but "when."

We are pleased to share this first Scenario Testing Our Mutual Future report. NAMIC and Guy Carpenter look forward to reader feedback and encourage readers to reach out to the authors with any questions or comments that might help improve the next edition of this report.

METHODOLOGY AND GOALS

The scenario tests began by examining each U.S. P/C company's 2020 Annual Statement filed with the National Association of Insurance Commissioners. Using Guy Carpenter's proprietary standardized capital modeling framework, BenchmaRQ™, Guy Carpenter conducted a simulation of future operating results based on underlying risk distributions, including capital market outcomes, insurance market cycles, attritional and large losses, and catastrophic events. These scenarios take into account each company's own financial history, Guy Carpenter's insurance risk benchmarks, economic projections from Moody's Analytics™, and market share-based catastrophe modeling run through AIR™. The output from BenchmaRQ provides valuable insights on a company's performance across a range of potential scenarios for what the future may produce. Comparing performance across the loss curve with expected results informs a deeper understanding of a company's loss sensitivities and exposure to different types of scenario testing.

Additional context is provided by comparing a company to its peers or market competitors. In the sections of this report covering each scenario test, we document our rationale and assumptions adopted for modeling the scenario testing.

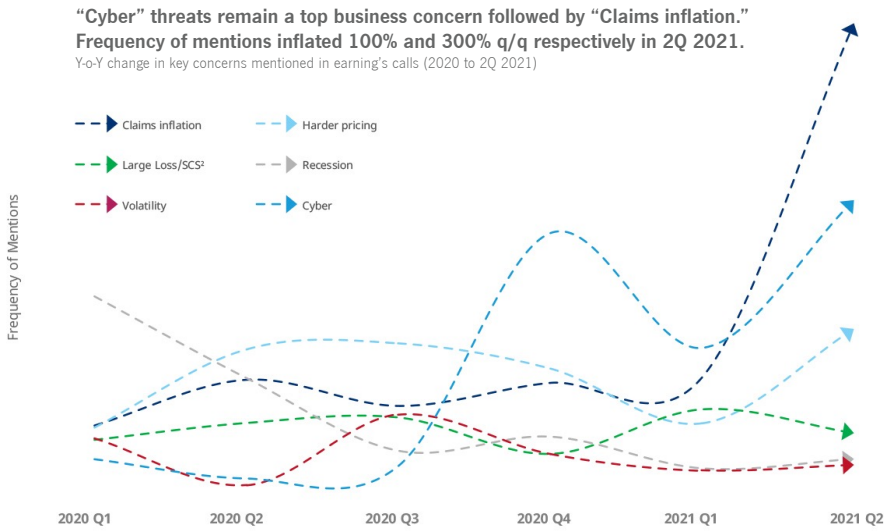
GOALS OF THE SCENARIO TESTS

Systemic shock scenarios are unpredictable and challenging to forecast by nature, so it is helpful to reference multiple sources when deciding which scenarios to incorporate into the model. Best monitors the solvency and risk profile of most of the U.S. and global insurance markets and has made scenario testing a point of emphasis in its ratings evaluations. Best has put the task of selecting and defining relevant scenario tests onto the management teams of each company, with the goal of reflecting probable and impactful potential exposures and aligning action plans around exposure outside its risk appetite. Regulators in several states, including New York, have begun asking companies to provide enhanced disclosures around cyber risk and exposure to climate change. Additionally, in some cases, boards of directors are reaching out to management for information on risk mitigation strategies across specific areas of interest.

[1] Affirmative cyber risk is the insurance loss exposure in policies that grant explicit cover for losses arising from cyber incidents. Silent cyber is the exposure when cover for losses arising from cyber are not clearly stated in the policies. Lastly, operational risk is the risk that an insurance company will be directly affected by a cyber incident involving the company itself.

Public stock companies must disclose key risks and emerging threats they are monitoring, and equity analysts will ask questions on facets of the market that may present risk to future performance. Frequency of topic mention trends in investor analyst calls and public communications and disclosures collected from 35 U.S. regional and national publicly traded P/C companies is shown below. Cyber risk increased from the lowest priority in first quarter 2020 to one of the highest in recent quarters. Chance of a recession registered very high on company concerns in second quarter 2020 through the middle of the pandemic-induced lockdown, but recession concerns have since largely abated from the short-term radar of investors and now register among the lowest of tracked risks. Interest in large losses driven by SCS has not surprisingly displayed seasonality, while inflation has risen greatly in prominence recently on the radar of public companies and the analysts that cover them.

Chart 2. Frequency of Concerns Mentioned Over Time



Based on the above data and feedback from a range of sources, we selected five scenario tests, which are described in detail in their respective sections in this report. As the road ahead for insurers remains uncertain, NAMIC and Guy Carpenter will continue to develop relevant and impactful scenario testing and provide detailed company-level results of the tests to NAMIC member companies.

COMPANY SEGMENTATION

Peer comparisons provide direction for further investigative action: what decisions should be made to manage downside risk in catastrophic events or volatile asset markets? These comparisons help to illuminate possible areas of outsized risk exposure versus competitors, provide direction on where to focus for performance improvement, and highlight comparative advantages or weakness for companies. Assessing one's own risk quantitatively under various scenarios provides data to support dialogue with company stakeholders, regulators, and rating agencies. Companies were segmented by four profile characteristics: size, region, line of business focus, and company structure. Regional and line of business focus segmentations followed the SNL segment methodology and naming conventions. Guy Carpenter performed the full stochastic capital model for baseline and scenario tests on 1,008 combined and unaffiliated entities. The cluster analysis removed companies that were return-on-surplus outliers or had premium levels below USD 5 million, leaving 712 companies for the cluster analysis.

SIZE

Companies[2] were segmented by size of direct written premium as of 2019, as provided by NAMIC. The figure below shows a breakdown of companies modeled by count and premium.

Table 3. Company Count and Sum of Net Premium Written by Size

Size	Company Count	2020 NPW($M)
< $20M	458	3,992
$20-$100M	226	8,859
$100-$500M	188	37,152
$500M-$2B	88	81,318
> $2B	48	524,611
Total	1,008	$655,933

REGION

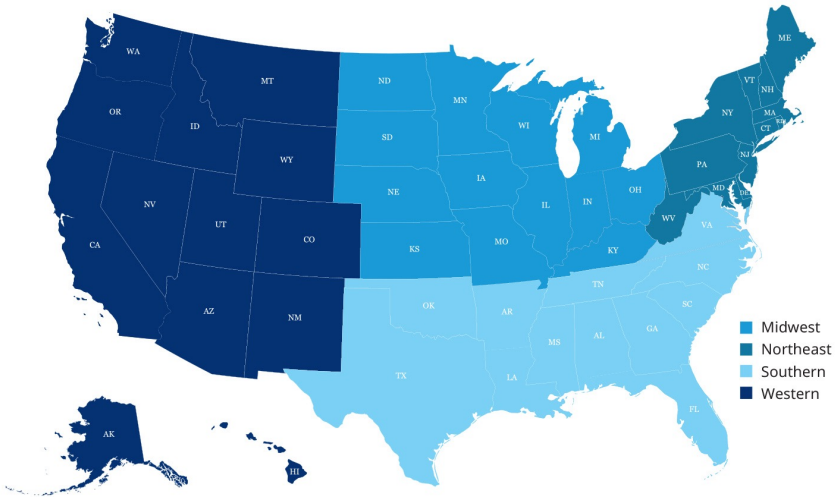
Companies that had a geographic focus were put into a geographical regional group or, if they wrote a sufficient amount nationally across various regions, in the national group. The S&P Capital IQ definitions and mapping for geographic focus were used. State-level premiums were aggregated into four regions as defined by the U.S. Census Bureau. If a company had 50% or more premium in one region, then the company was mapped to that region. Otherwise, if the company's premium was distributed across multiple regions such that no region made up at least 50% of the premium, the company was mapped as a national writer. Companies that wrote less than USD 1 million or had premium values not available were not assigned to a region (S&P CapitalIQ).

Table 4. Company Count and Sum of Net Premium Written by Region

Regions	Company Count	2020 NPW($M)
National	230	508,190
Midwest	147	28,003
Northeast	140	14,510
Southern	269	58,385
Western	96	44,804
No Region Assigned	126	2,041
Total	1,008	$655,933

[2] "Company" in this report is defined based on S&P company groupings of legal entities, consistent with NAMIC's approach used in other market reports.

Chart 3. Regional Definition by State



COMPANY STRUCTURE

The mutual segment comprises the following categories of company structures: Combined and unaffiliated entity mutual companies; exchanges, including reciprocal exchanges; risk retention groups; captives; cooperatives; and nonprofits. The stock segment comprises publicly and privately traded stock companies. Other segmentation types include limited liability corporations, U.S. branches of alien insurers, insurance pools or trusts, syndicates, and other entities. Table 5 shows company count and net written premium distribution by ownership type: count and premium breakdown between mutuals and stocks are relatively balanced.

Table 5. Company Count and Sum of Net Premium Written by Structure

Structure	Company Count	2020 NPW($M)
Mutual	487	275,117
Other	31	2,816
Stock	490	378,000
Total	1,008	$655,933

LINE OF BUSINESS

Companies were segmented into line of business focus. Generally, the company was mapped to the line of business with the most premium. All companies with less than USD 1 million in net premiums were filtered out and not assigned to a line of business focus. Then, companies that had reinsurance assumed from non-affiliates that totaled more than 64% of their premiums written from direct business and reinsurance assumed from non-affiliates were mapped to the reinsurance line of business. Remaining companies were assigned to the line of business that held the greatest proportion of net premium written (S&P CapitalIQ). Table 6 shows the Personal Lines Segment accounting for the highest company count as well as the greatest proportion of NWP.

Table 6. Company Count and Sum of Net Premium Written By Line of Business Focus

Structure	Company Count	2020 NPW($M)
Accident	7	1,177
Commercial Financial	35	4,492
Commercial General Liability	77	15,415
Commercial Lines	93	131,991
Commercial Medical Malpractice	109	5,711
Commercial Property	184	59,513
Commercial Workers'Compensation	83	14,238
Large Reinsurance	9	29,375
Personal Lines	270	391,654
Personal Property	1	3
Reinsurance	14	324
No line to assign	126	2,041
Total	1,008	$655,933

APPROACH TO CLUSTERING COMPANIES BY RISK AND RETURN PROFILE

In pursuit of further insights into how companies perform against their peers, companies were grouped in similar return and volatility profiles. A "k means" clustering statistical analysis was performed on the company's modeled results. Clustering of data points aims to group companies with similarly performing peers while maximizing the difference between groups and minimizing that distance within a group[3].

The result of the clustering is companies grouped by performance cohort, which goes from the highest performing group in light blue in the top left: low volatility, outperforming to the lowest performing group in red in the bottom right: high volatility, underperforming. The three middle groups take up various positions on the tradeoff between volatility and return, dark blue in the top right: high volatility, outperforming; peach in the center: moderate volatility, underperforming; and gray in the bottom left: low volatility, underperforming. The graph below shows the clustering of company modeling results; each dot represents one company's risk and return profile based on the Baseline 2021 BenchmaRQ analysis.

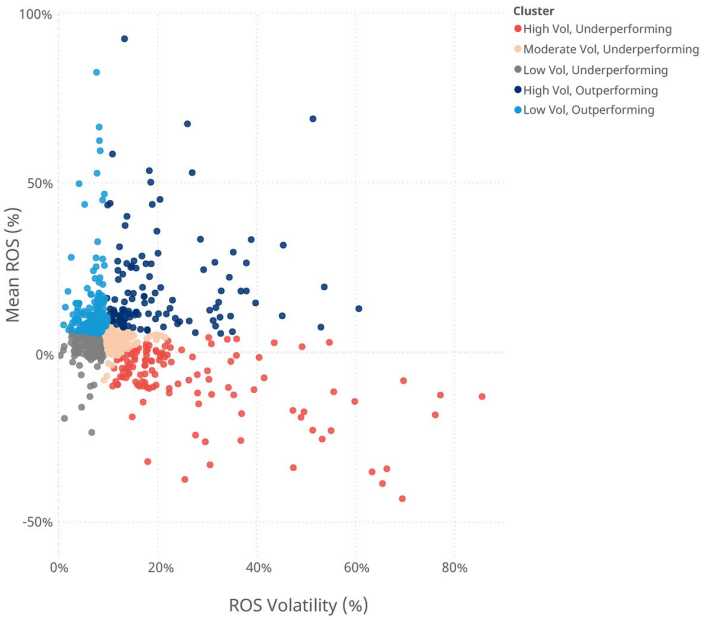
[3] This helps identify objective insights into how the companies are best grouped into cohorts based on the performance characteristics of mean return on surplus and variance of return on surplus. The non-hierarchical Euclidian distance was used to assign and calculate centroids based on normalized return on surplus and volatility data sets. The result placed every entity with the closest centroid, recalculated in an iterative manner until no companies switched clusters. This analysis was performed on all statutory P/C filers, excluding those that presented as outliers: those that had a return on surplus above – 100% or below a loss of surplus of 100%, as well as those companies with less than USD 5 million in net premium written.

Ultimately the number of clusters selected was 5 due to the locally optimized results, as supported by the Calinski and Harabasz test (CH test) at k=5. Results from the various scenario tests were then applied to the baseline centroid data points to remap companies to cluster cohorts. The target central point for the cluster remained constant, thereby holding consistent the performance boundaries that define each cluster. By holding the performance characteristics consistent, insight into how companies move between the clusters helps to form understanding of how a company would handle a scenario test compared to its baseline peers.

BASELINE MODEL AND KEY FINDINGS

To help facilitate understanding of scenario test impacts, we first needed to consider how each company is projected to perform in an expected operating environment, which we call the baseline model. This baseline view is helpful in contextualizing how performance prospects have changed over the years for the P/C market.

Chart 4. Baseline Cluster Results



For the industry in aggregate, the expected return on surplus for 2021 was 5.4%, with an overall volatility of 8.0%. This is an improvement from the 2020 baseline model, which simulated a 4.8% return and a volatility of 8.8%. The industry delivered an 11.9% return in 2020, due largely to a COVID-19-driven slowdown in auto and premises liability claims, and a U.S. equity market that rebounded from a 35% decline in March, to end the year up 18%[4]. The improvements in expected return and volatility in the 2021 model compared with 2020 reflected higher rate levels across most commercial lines, continued favorable loss trends in the workers' compensation line, and an expectation for lower asset market volatility as fiscal and monetary stimulus worked through the system. The authors project an average industry underwriting combined ratio in 2021 of 97.5%, in line with the 2020 industry results, and better than the 98.3% that was projected for 2020.[5,6]

In the following section, researchers will break down the 2021 baseline model results for the different segments and offer high-level observations on trends by type of carrier.

[4] The 7.1% difference in pre-dividend ROS was driven by 7.9% higher than expected pre-tax investment gain, 0.5% lower than expected calendar year underwriting return, and 0.3% higher than expected taxes and other charges.

[5] ROS does not explain where profits are coming from, how sustainable they are, or how risky the company is. While ROS is the best profitability metric, it is worth noting that policyholder dividends and changes in paid surplus are not considered. Further, we might point out that highly leveraged companies can have a high ROS.

[6] Historically, return on surplus has averaged 8.0% over the last 25 years. Source: U.S. P/C Statutory Annual Statement filings, NAIC, S&P Capital IQ.

OVERVIEW OF SEGMENT RESULTS

BY SIZE

The largest companies in the industry had lower expected operating volatility than smaller companies due to their greater product and regional diversification. Very large companies were also more likely to have an expected return on surplus of 5% or greater. The smallest companies, those with premium <USD 20 million, were most likely to have flat or negative expected returns as their smaller size often drives higher expense ratios and challenges competing with the scale advantage of larger competitors.

Chart 5. Cumulative Distribution of Baseline Mean ROS by Company Size

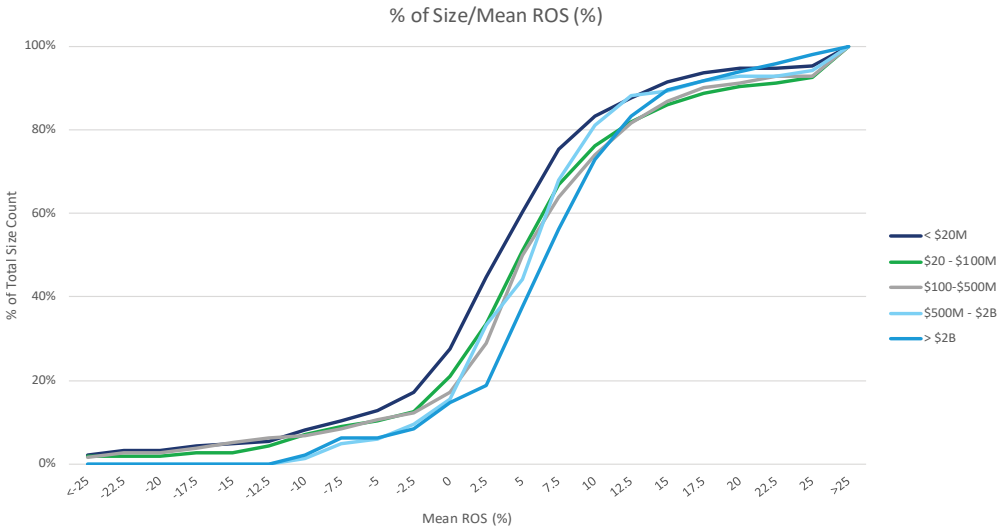
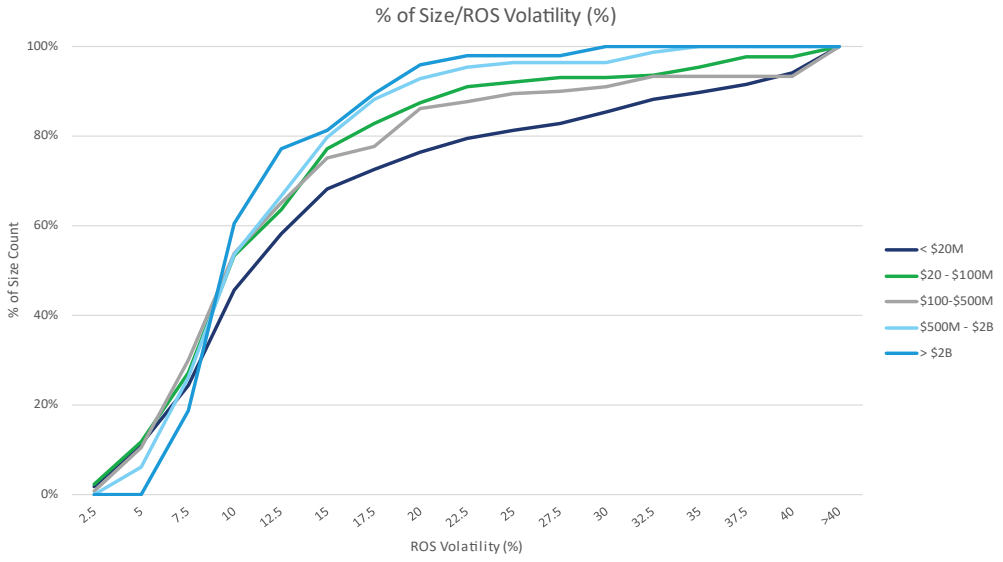


Chart 6. Cumulative Distribution of Baseline ROS Volatility by Company Size



BY REGION

Midwest companies tend to have lower expected operating volatility, while a larger share of West Coast and Northeast writers had very high expected volatility in their performance. Midwest companies also had the highest expected underwriting return among all regional segments, though few were expected to deliver returns on surplus greater than 12% - 15%. Among regional segments, national carriers had the largest share of companies expected to deliver returns on surplus of 10% or more while writers in the South and West were most likely to deliver an expected loss in surplus.

Chart 7. Cumulative Distribution of Baseline Mean ROS by Regional Segment

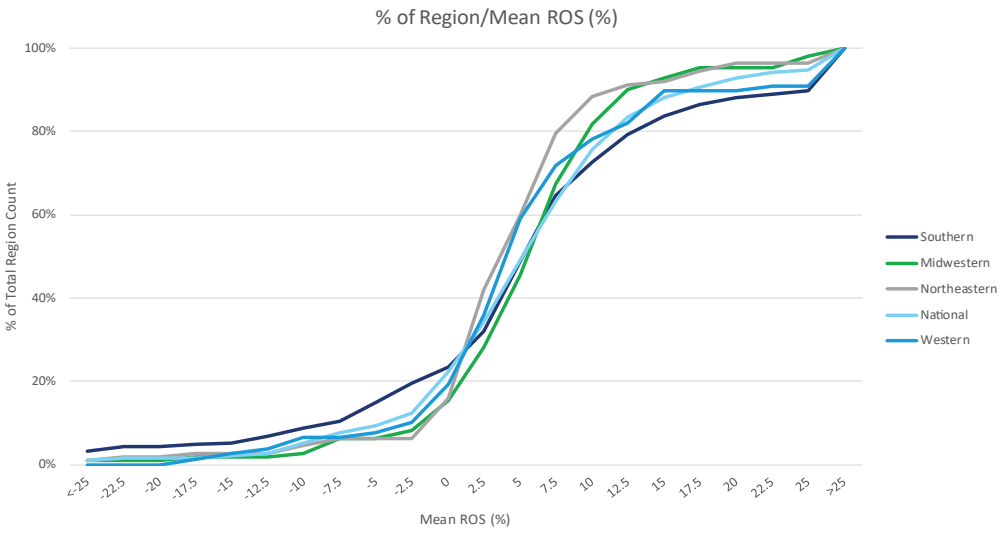
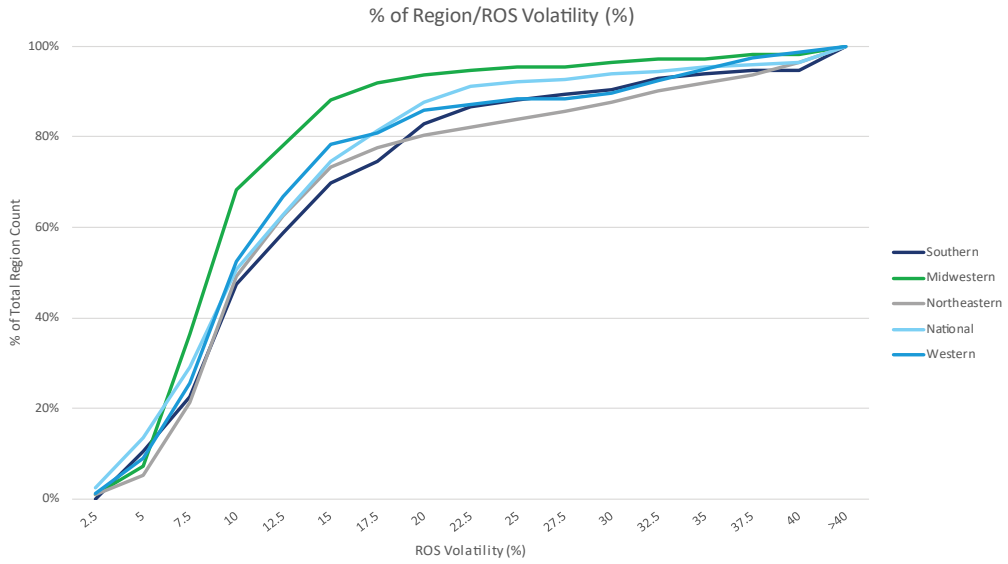


Chart 8. Cumulative Distribution of Baseline ROS Volatility by Regional Segment



BY COMPANY STRUCTURE

Mutual companies were much less likely than stock companies to have a high surplus volatility; fewer than 5% of mutuals studied showed a surplus volatility of greater than 20% while more than 20% of stock companies and 35% of insurers with other company structures have an expected surplus volatility over 20%. One driver of this is the higher operating leverage that stock companies and captives can tolerate due to their ability to easily raise capital.

Because mutuals are managed with policyholders in mind, it is intuitive that the vast majority of mutuals were projected to deliver a return on surplus between breaking even and a 10% - 12% gain.

Operating with a very high expected return on surplus could be counter to the mission of most mutual insurers. By contrast, over 35% of stock companies operate with an expected return of over 10%, which is driven by the need to deliver a return on investment to their shareholders. While relatively few stock and mutual companies were operating with more than a small expected loss, nearly 20% of companies with other structure types operated at an expected loss of 5% or more. These entities included LLCs, U.S. branches of alien insurers, insurance pools or trusts, and syndicates and often operated as components of a larger organization or designated risk management vehicles. In many cases they are not designed to deliver an economic profit but are vehicles to manage risk.

Chart 9. Cumulative Distribution of Baseline Mean ROS by Company Structure Type

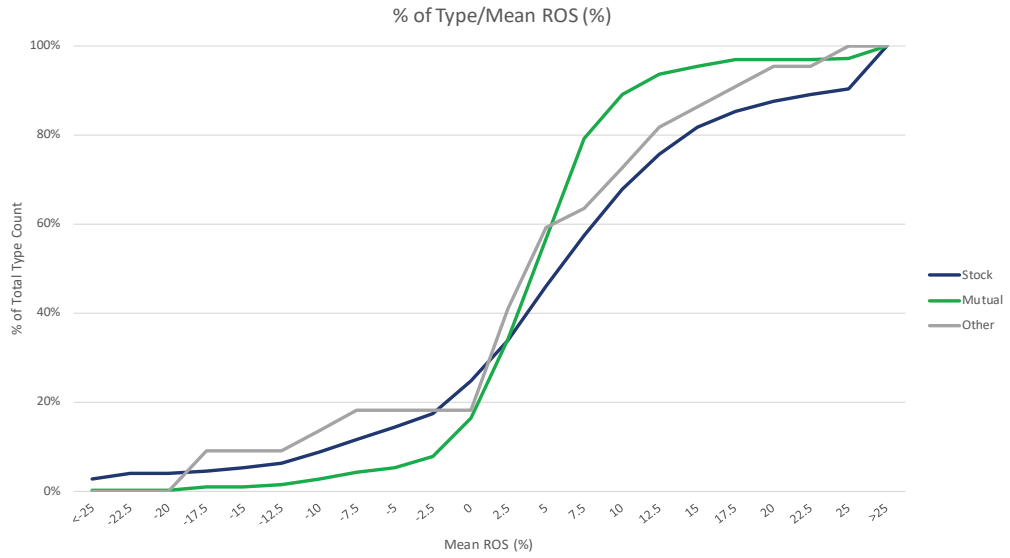
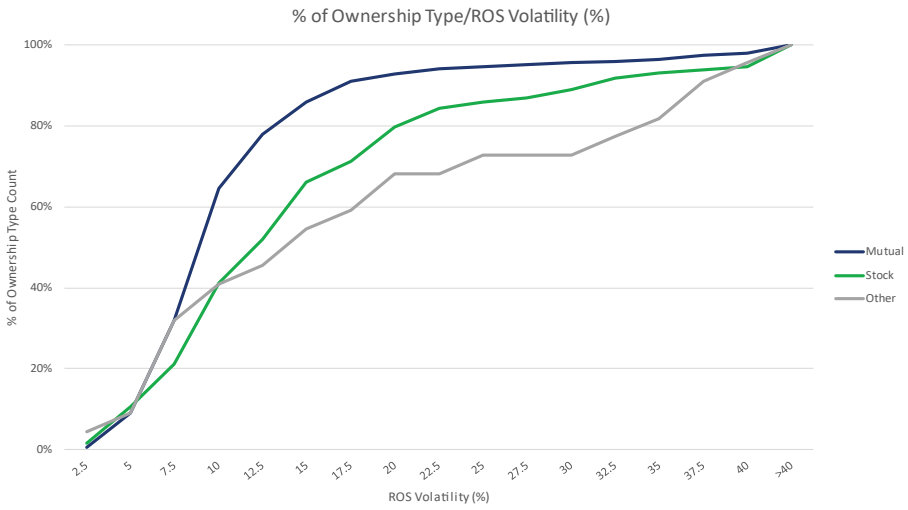


Chart 10. Baseline ROS Volatility by Company Structure



BY LINE OF BUSINESS

The market cycle is an important driver of expected carrier profitability in the P/C industry, particularly for commercial lines writers. From 2019 through the first half of 2021, commercial lines writers enjoyed a long-awaited rate hardening, which increased pricing on some coverages by 50% - 100%. This market hardening has created an environment for underwriting profitability in some commercial lines that is more favorable than has existed for years. For the 2021 modeled year, more than 35% of commercial lines writers were expected to deliver returns on surplus in excess of 10%, with less than 25% of personal lines writers projecting similar returns.

Workers' compensation writers have enjoyed several years of historically strong underwriting profitability, driven by consistently better than expected claim-cost trends. In 2021, the workers' compensation market is experiencing few signs of near-term changes in operating environment, with COVID-19 serving to further reduce frequency of smaller medical-only losses. As such, workers' compensation specialist writers were projected to have among the lowest operating volatility of all product segments. Outside of workers' compensation writers, the distribution of expected volatility was similar between commercial and personal lines writers.

Chart 11. Cumulative Distribution of Baseline Mean ROS by Line of Business Segment

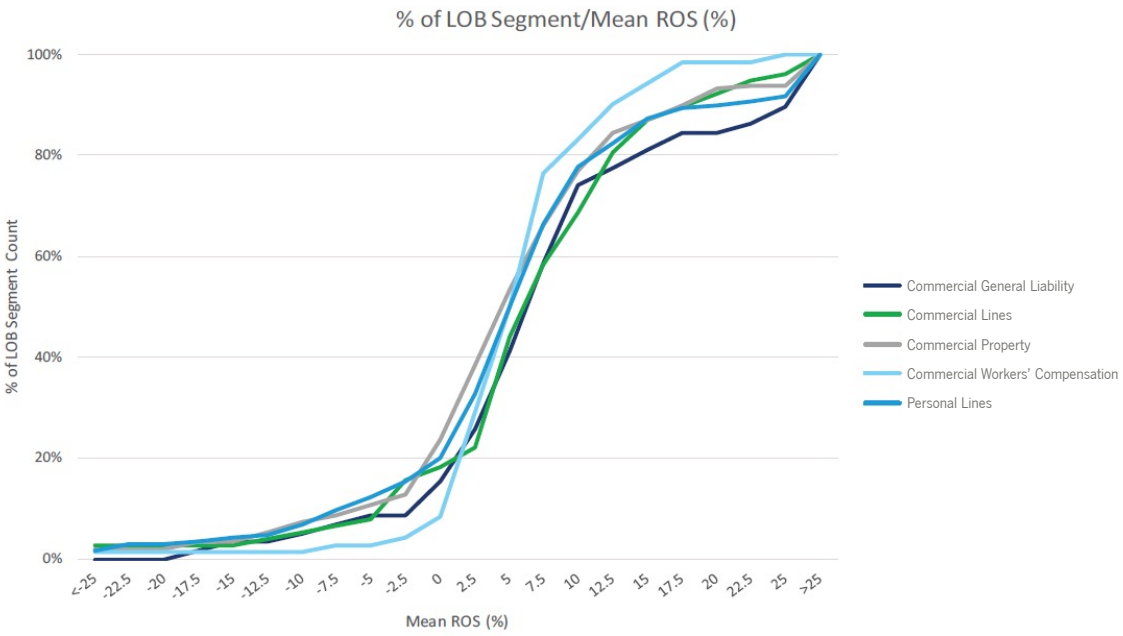
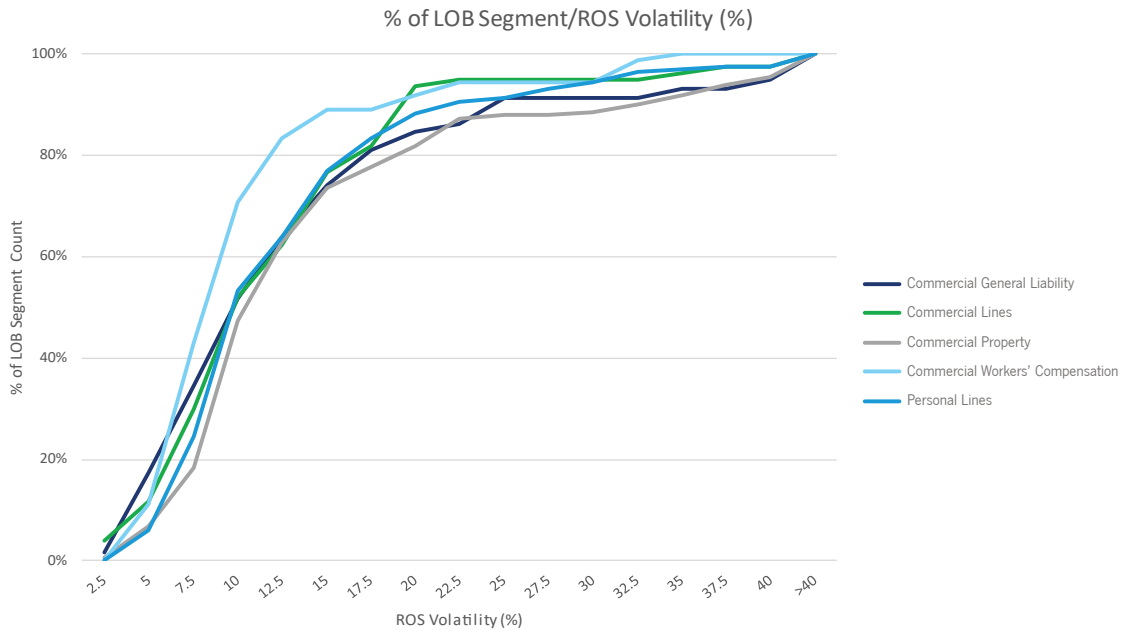


Chart 12. ROS Volatility by Line of Business Segment



SCENARIO TEST 1 – INFLATION

KEY FINDINGS

An unexpected increase in inflation would result in widespread impacts for carriers across the industry. This scenario resulted in the highest number of companies experiencing viability concerns, with nearly 1 in 10 companies showing an expected loss of surplus in excess of 25%.

Carriers writing longer-tail lines of business and those companies with higher levels of loss reserves on their balance sheets felt the biggest impact from inflation. Larger writers also tended to experience a more severe result from inflation, in part due to their business mix being more heavily concentrated in commercial casualty lines.

Mutual companies were slightly less exposed to inflation than stock companies. As seen in the overview of results below, 45% of stock companies saw an expected loss of surplus of 5% or more in an inflationary environment compared with less than 35% for mutuals. Because stock companies typically operate with higher underwriting and reserve leverage than mutuals, the inflation scenario further exacerbated the operating volatility of many stock companies. Mutuals generally could expect a narrower range of performance outcomes due to higher levels of excess capital.

Commercial lines writers could expect to see greater risk from inflation due to the higher limits and longer-tail nature of commercial lines products. As the Consumer Price Index (CPI) and other conventional measures of inflation continue to rise, all insurers must be aware of inflation's potential impact on their prior-period loss reserve adequacy, as well as the base rates and loss development factors used when pricing new business. In an environment of persistent negative real yields, carriers no longer can assume investment returns will match increases in future claims costs and must be prepared to adjust rate level, policy limits, and attachment points to manage their exposure to this risk.

ASSUMPTIONS

What could cause this scenario? The recent increase in M1 money supply and historic levels of fiscal stimulus caused the underlying level of inflation in the U.S. economy to pick up at a rate faster than anything experienced over the past decade. Higher labor and materials costs drive up replacement costs for property claims, while medical and social inflation drive higher severity for casualty and liability losses. As the Federal Reserve Bank keeps the low end of the curve close to 0%, interest rates begin to rise at the long end of the curve as investors demand more return to invest in longer dated bonds. Social inflation drives up liability settlements while labor and material costs drive higher than expected severity trends across property lines.

For the inflation scenario, researchers calibrated the underwriting impact based on two commonly used measures of inflation, the CPI and Medical CPI, the latter of which focuses specifically on a basket of health care expenditures. The inflation scenario test was defined as the 1:100 return period over a five-year horizon within the Moody's Economic Scenario Generator. A 99th percentile excess inflation rate over five years was applied to future loss payments on both reserves and current accident year exposures. For property, specialty, and marine lines, General CPI will be used. Medical CPI was applied for all other lines. Interest rate changes are more drawn out, so this scenario is expected to materialize slowly with potential leading indicators to help companies manage its effects over multiple calendar periods.

Table 7. CPI Cumulative Selected Inflation

Year	Median	1:100 Year Return Period	Difference (Excess Inflation)
1	2.0%	4.0%	2.1%
2	3.9%	7.6%	3.7%
3	5.8%	11.7%	5.9%
4	7.9%	16.3%	8.4%
5	10.1%	21.8%	11.7%

Source: Moody's Analytics

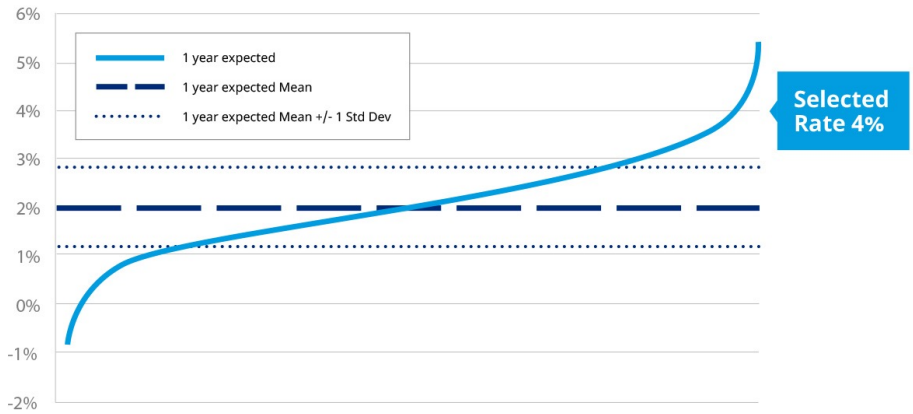
Table 8. Medical CPI Cumulative Selected Inflation

Year	Median	1:100 Year Return Period	Difference (Excess Inflation)
1	3.1%	6.7%	3.6%
2	5.7%	12.6%	6.9%
3	8.2%	19.2%	11.1%
4	10.7%	25.9%	15.3%
5	13.2%	32.7%	19.5%

Source: Moody's Analytics

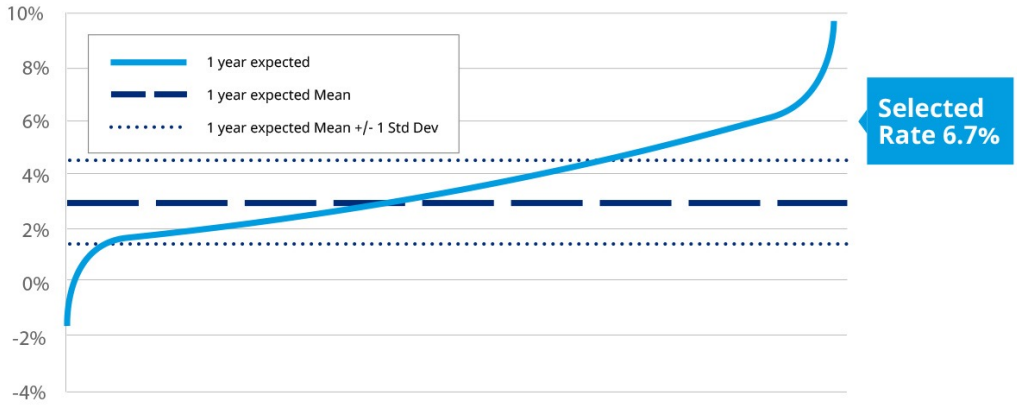
The excess inflation rates affect payment patterns for reserves and in-force policies, increasing the expected payment amount and consequently changing the payment patterns. It will take carriers time to be approved for and implement rate increases necessary to reflect this sharp increase in loss costs, so increased premium rates are not reflected as a part of this scenario testing. This will provide a more credible view of an unanticipated inflation shock to insurance companies. Though yields on new investments are rising, the market value of fixed-income assets already on insurers balance sheet will decline, exacerbating stress for companies that need to sell longer-dated assets to pay for inflated losses. Since results are presented in Statutory Accounting Principles, the scenario does not layer additional changes to the asset valuations. Carriers should, however, monitor changes in market value of fixed-income securities designated as hold to maturity to manage potential liquidity risk.

Chart 13. USD 1-Year CPI Inflation – All Return Periods



Source: Moody's Analytics

Chart 14. USD 1-Year Medical CPI – All Return Periods



Source: Moody's Analytics

An example is shown below of how the increased inflation affects the model input parameter of a company's homeowners line. The increase in General CPI was applied for each development period and then renormalized to match to 100% payment pattern. This example shows that homeowners experienced a 2.92% effect due to loss inflation applied to its development pattern.

Table 9. CPI Applied to Homeowners Line of Business

Line of Business	Development Period (in months)										
	0-12	22-24	24-36	36-48	48-60	60-72	72-84	84-96	96-108	108-120	120+
HO	69.8%	22.5%	3.8%	1.8%	0.9%	0.5%	0.2%	0.2%	0.1%	0.1%	0.2%
General CPI Increase Applied	2.1%	3.7%	5.9%	8.4%	11.7%	11.7%	11.7%	11.7%	11.7%	11.7%	11.7%
Impact of Loss Inflation	2.92%										

OVERVIEW OF INFLATION SCENARIO RESULTS

The inflation scenario test resulted in large disruptions within the industry expected to cause an industrywide loss of surplus of USD 74.5 billion and USD 22.9 billion in loss to mutual companies alone. While 24% of mutuals had an expected loss of surplus in 2021, that figure increased to 59% expecting a loss of surplus under the inflation scenario test. Additionally, while only 5% of mutuals were projected to have a loss of surplus of 10% or more, the inflation scenario causes that figure to nearly quadruple to 19%. Companies most likely to respond to inflationary pressures were large companies with casualty or long-tail lines or those with greater reserve to surplus leverage. Clustering analysis illustrates the changes across the universe of companies by segmenting the companies into performance categories. Reviewing the clustering results provides additional insights into how individual companies and segments performed under the scenario test. Key observations from the results for inflation are highlighted below; the full detailed table of results is available in the appendix:

Size: In an inflationary environment, larger companies were much more vulnerable to dropping out of the top performing group than smaller carriers. Twenty-five percent of the companies in the USD 500 million–USD 2 billion and above group dropped out of the top performing category, leaving only 6%. Likewise, 40% of companies with premium volume over USD 2 billion dropped out of the top performing group, leaving only 4%. Sensitivity by larger companies to the inflation scenario is driven by an increased likelihood to write casualty and longer-tail lines of business, which hold greater reserves. In contrast, companies less than USD 20 million and USD 20 million–USD 100 million in size are less susceptible to dropping from the top performing group. In fact, the size group with the largest probability of being in the top performance group in an inflationary environment is the USD 20 million–USD 100 million segment, a notable reversal from baseline expectations.

Region: Writers in the Northeast and Midwest regions experienced the largest expected impact from inflation. The proportion of Northeast writers in the top performance cluster fell from 17% to 6%, while the portion in the lowest performance cluster increased from 16% to 38%. Similarly, Midwest companies dropped 21% points from a 36% chance of being the top cohort to 15%, and an additional 12% settled into the lowest performance cohort. The concentration of commercial lines in the business mix of many of these regional specialists is the key driver affected from an inflationary environment.

Structure: Non-mutual companies, stock, and other types of company structure saw the largest increase in the high-volatility and low-return groups. Stock companies are generally more exposed to an inflationary environment than mutuals due to product mix and higher operating leverage. Chart 15 shows how ROS distribution changes between mutuals and stocks, with a greater performance divergence for stock companies. Other company structures include pools, trusts, and syndicates, which can be characterized by a casualty heavy mix of business and lower capitalization. For many of these companies, the inflation scenario can result in additional capital needs.

Line of Business: Commercial casualty writers, reinsurers, and medical malpractice companies should expect the largest impact from the inflation scenario, as evidenced in Chart 16. These lines of business are particularly vulnerable to an inflationary environment due to their long-tail nature, high limits/excess attachments points, and greater levels of loss reserves held on their balance sheets.

Chart 15. Cumulative Distribution of Mean ROS for Mutuals and Stocks in Baseline and Inflation Scenarios

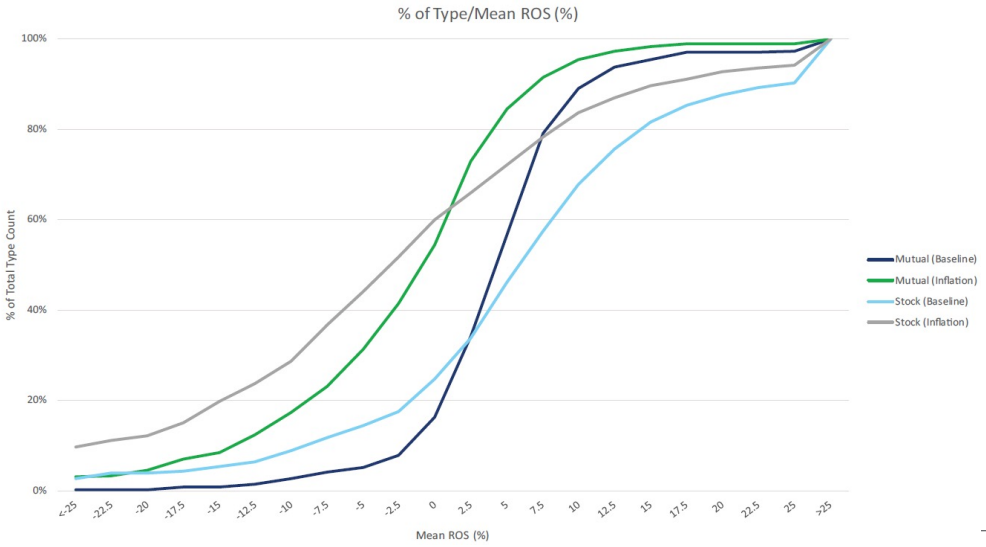
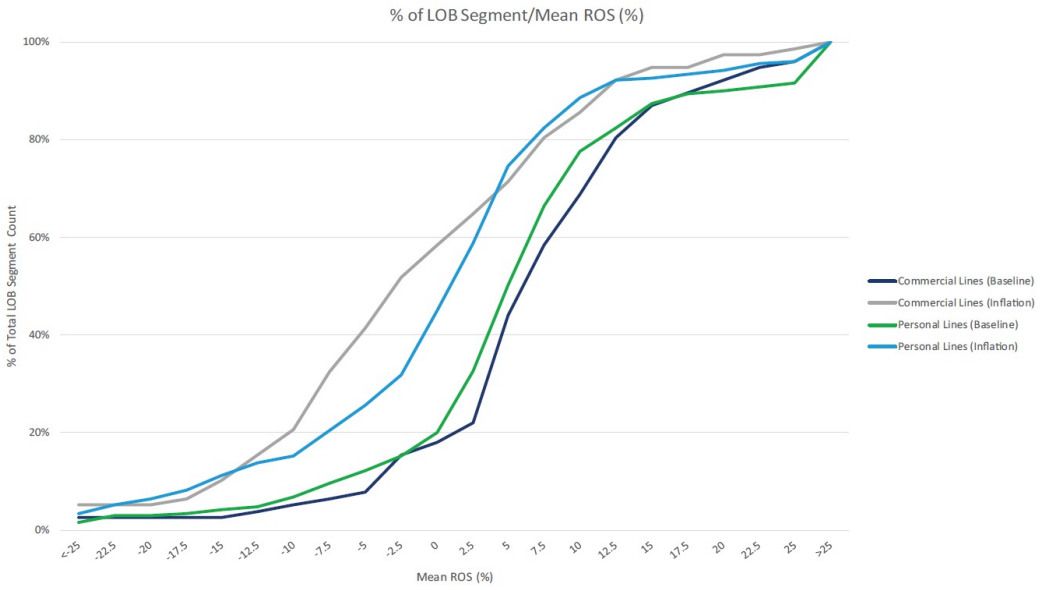


Chart 16. Cumulative Distribution of Mean ROS in Baseline and Inflation Scenarios by Line of Business Segment



SCENARIO TEST 2 – RECESSION

KEY FINDINGS

Of the five scenario tests analyzed, the recession scenario resulted in the greatest expected depletion of industry surplus, a nearly 15% reduction in expected industry surplus compared with the baseline model. The level of equities and other risk assets held on insurers' balance sheets has increased steadily since the Great Recession of 2008. The industry's latest exposure to high-risk investments was the highest it's been in at least the last 25 years – for every dollar of statutory surplus on insurers' balance sheets at year-end 2020, 79 cents was invested into public or private equity.

This equaled 36% of the total cash and invested assets held by the U.S. insurance industry. Mutual companies in particular should monitor their asset exposures carefully, as the scenario testing shows the typical mutual insurer is more exposed to recession risk than an average stock company. This was driven by higher operating expense ratios and higher allocation to equities than the levels of stock companies. The median mutual company had 22% of its invested assets in equities while the median stock company had 13%. Larger companies and carriers focusing on commercial lines showed a greater expectation of impact from a recession due to focus on more economically sensitive commercial lines, where exposure bases such as payroll or sales can decline quickly, sapping premium and enhancing risk of moral hazard from financially stressed policyholders.

ASSUMPTIONS

What caused this scenario? The COVID-19 lockdowns in 2020 were financially devastating to many small businesses and communities. Shifts in consumer behavior emerged over the past year and a half and may not return to pre-COVID-19 conditions. Government stimulus offered temporary relief for business owners and the unemployed, but as it ran out, many businesses were forced to close their doors for good, causing a ripple effect that has yet to be felt throughout the economy.

As unemployment remains elevated despite growing labor shortages and supply-chain disruptions persist, economic growth may struggle to return to pre-pandemic levels. Investor sentiment has been historically bullish, but changes in economic performance may cool this enthusiasm, resulting in a double-dip market correction. As businesses shutter and individuals lose their jobs, demand for insurance falls and moral hazard rises.

The insurance industry has weathered many recessions. Viewing prospective economic downturns with an understanding of prior events can help inform the view of the potential impact of a future recession. The investment return of insurance companies, which plays a critical role in supporting operating income and surplus growth, can fall significantly in market downturns. Over the past 100 years, the 10 worst annual performance returns for the Dow Jones Industrial Average (DJIA) ranged from -17.2% to -52.7%. The most recent year of those 10 worst years occurred in 2008. The DJIA's 2008 annual return was -33.8%.

The authors utilized the Economic Scenario Generator of Moody's Analytics and adjusted the mean total equity return to match the tail value at risk for the average of the 10 worst years out of the last 100 years, which was -27.3%.

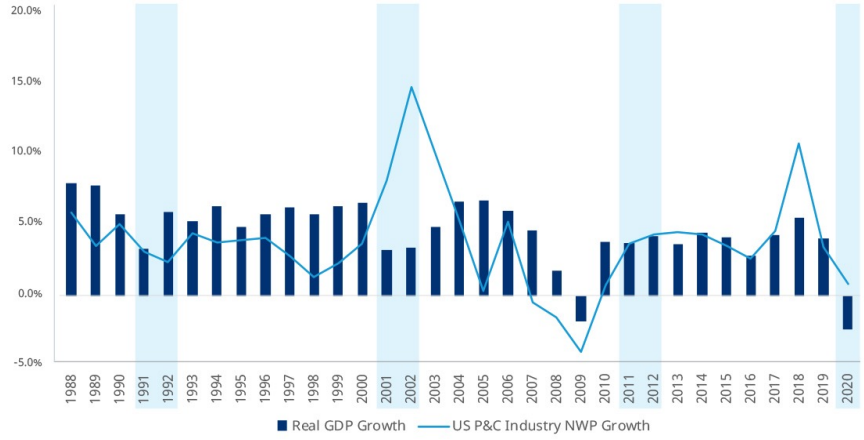
Corporate and municipal bonds experienced increased default risk rates to match the increase default from a downgrade 1 level in grade. Triple C bonds experienced a doubling in default risk within the first year.

Recessions also can affect the premium base of an insurer. Based on historical premium changes during recessions over the last 25 years, the negative premium impact of a severe recession was estimated by line of business. This reduction across all lines of business further impacts the company's financials. Variable costs will decrease correspondingly but fixed costs remain constant in the near term, leading to increased overall expense ratios.

Table 10. Selected Premium Growth Impact of Recession Scenario

1.	Homeowners/Farmowners (A)	0.0%
2.	Private Passenger Auto Liability (B)	-3.0%
3.	Auto Physical Damage (J)	-4.8%
4.	Special Property (I)	-5.0%
5.	Commercial Multi-Peril (E)	-7.4%
6.	Commercial Auto Liability (C)	-12.7%
7.	Workers' Compensation (D)	-20.0%
8.	General Liability Occurrence (H1)	-15.5%
9.	General Liability Claims-Made (H2)	-7.0%
10.	Medical Malpractice (F1, F2)	-7.6%
11.	Product Liability (R1, R2)	-20.0%
12.	Reinsurance (N, O, P)	-20.0%
13.	Financial Lines (K, L, S, T)	-13.0%
14.	Other (G, M)	-20.0%

Chart 17. In three of the last four recessions, there has been a deceleration or drop in P/C insurance premium



To reflect moral hazard experienced in prior recessions, the workers' compensation lines were modeled with a 6 percentage point increase in loss ratio compared with the base case due to its trend of adverse development in economic downturns. All other lines of business do not have additionally stressed loss ratios, as the premium decrease was intended to be offset by a reduction in insured exposure.

OVERVIEW OF RECESSION SCENARIO RESULTS

Key observations from the results for recession are highlighted below; the full detailed table of results is available in the appendix:

Size: Similar to the inflation scenario, larger companies were much more vulnerable to dropping out of the top performing group. Companies in the USD 500 million–USD 2 billion and above segments dropped 25% points from 31% and 35% points, respectively, from 44% in the top performing group. Companies below USD 20 million and USD 20 million–USD 100 million in size were less susceptible to dropping from the top performing group.

Region: Writers in the National and Midwestern regions showed the largest impact from a recession. Writers in the South and West regions experienced the lowest expected impact, as many of these regional writers in peak catastrophe zone regions hold fewer equity assets and focus on lines such as homeowners and commercial property, which are less economically sensitive.

Structure: Mutual companies showed a larger drop in performance cluster[7] compared with stock and other types of company structure. Only 5% of mutuals remained in the high-return and low-volatility cluster, compared with 27% in the baseline. Ninety-two percent of mutual companies were in one of the low-return clusters in the inflation scenario, up from 66% in the baseline. For comparison, 27% of stock companies remained in one of the two high-return clusters in the inflation scenario.

Line of Business: Workers' compensation specialists experienced the greatest expected impact from a recession, as they could anticipate an increase in loss activity in addition to a large potential decline in premium. Twenty-seven percent of workers' compensation specialists moved from a high-return cluster to one of the low-return ones. Commercial general liability line writers showed an expected reduction in return profile in a recession, with 22% of these writers moving from a high- to low-return cluster.

SCENARIO TEST 3 – CYBER

KEY FINDINGS

A systematic cyber event that triggered "silent" coverage across a range of policies would be an earnings event, not a solvency event, for most companies. The average company modeled saw a 1% decline in expected return on surplus from this scenario test relative to the baseline, with less than 10% of companies seeing an impact of 3% or more.

Companies with the greatest concentration in commercial multi-peril, financial lines, and general liability should expect the

[7] Performance cluster refers to the five clustered groups resulting from the clustering analysis as described in the "Approach to Clustering Companies by Risk and Return Profile" section. Clustering results and tables can be found in the appendix.

greatest exposure to this type of event. The cyber scenario test was based on amplifying a historical event to have a greater industrywide financial impact, in line with recent trends in size and cost of cyber losses. Insurers have taken steps over the past several years to introduce more explicit cyber exclusions in multi-peril products and develop affirmative cyber products to meet the coverage gap. Until these cyber exclusions are tested in a large-scale cyber event and in the courts, carriers should remain vigilant in monitoring how cyber events could trigger losses across their portfolio and ensure to the extent possible their reinsurance coverage is in sync with their primary policies to prevent any coverage gap.

ASSUMPTIONS

What could cause this scenario? An increase in employees working remotely makes many businesses more vulnerable to cyber events. A large-scale, coordinated cyberattack affects multiple companies' computer systems, a scenario potentially reminiscent of the 2017 "WannaCry" attack.

Perpetrators of the attack will likely have a primary goal of extracting ransom payments from government and corporate victims and a willingness to delete their victims' data if the ransom is not paid. These escalated demands for payments and destruction of data likely result in significant damage to insurance clients, which could directly or indirectly trigger coverage through their insurance policies covering business interruption, professional liability, or general liability even though no affirmative cyber coverage was written. Insurers may be required to absorb the full cost of these types of cyber losses due to recent exclusion wording in reinsurance contracts. We would expect this risk to materialize relatively quickly.

Table 11. Impact to Loss Ratio by Line

Line of Business	Change in Expected Loss Ratio
Special Property (I)	2.5%
Commerical Multi-Peril (E)	6.0%
Workers' Compensation (D)	0.5%
General Liability (H1, H2)	5.0%
Medical Malpractice (F1, F2)	1.0%
Products Liability (R1, R2)	1.0%
Financial Lines (K, L, S, T)	6.0%

The scenario test we conducted reflects the risk of silent, or unintended, cyber only. The affirmative cyber coverage market is still relatively limited and less relevant to most NAMIC member companies. Costs incurred in the form of business interruption, data replacement, ransom payments, and other casualty costs will have a significant impact on insurers and will be seen in increased loss ratios. Exposure was based on various Schedule P lines of business, particularly focusing on business interruption, other liability claims made, and commercial multi-peril.

OVERVIEW OF CYBER SCENARIO RESULTS

Reviewing the clustering results provides additional insights into how individual companies and segments performed under the scenario test along with a high-level overview of the shape and distribution of performance. Note that the cluster results and distribution of return on surplus between the cyber and baseline scenarios showed few large shifts in performance profile, but it is important to consider the operational and reputational impacts to the organization as well in analyzing cyber losses.

For carriers that offer cyber coverage through a bolt-on product or other fully reinsured instrument, it is important to understand how these products could respond in the case of a systemic cyber loss event. Even for a 100% ceded cyber coverage, carriers may find themselves exposed to credit or reputational risk if the risk-bearing entity is no longer able to back the product. Key observations from the results for the cyber scenario test are highlighted below; the full detailed table of results is available in the appendix:

Size: Larger companies were more vulnerable to dropping out of the top performing group than smaller carriers. Companies in the USD 500 million–USD 2 billion and above USD 2 billion groups both dropped 6% points from 31% and 45%, respectively, in the top performing group. Companies below USD 20 million in size were less susceptible to dropping from the top performing group. Despite the largest (tied) percentage drop in the largest size segment, companies with greater than USD 2 billion in net premium written remained with the highest chance of being in the top performance group.

Region: National writers, as well as companies in the Northeast and Midwest regions, saw the largest impact from a cyber risk among regions due to the lines of business written.

Company Structure: Higher underwriting leverage among stock companies resulted in outsized exposure to a silent cyber event. About 6% of stock companies dropped from one of the two Outperforming clusters into an Underperforming cluster, compared with 4% of mutuals. The higher leverage among stock companies as well as more concentration in commercial lines drove the increased exposure to a cyber risk.

Line of Business: Financial lines writers were the most exposed to a systematic cyber event, with 16% falling from the highest-performance cluster to lower-return clusters. Commercial lines writers across P/C lines were the next highest exposed writers, with 8% - 9% falling from a high-return cluster to a low-return one.

SCENARIO TEST 4 – SEVERE CONVECTIVE STORMS

KEY FINDINGS

Severe convective storms tend to be an earnings event for most companies, adding volatility and additional losses to earnings without jeopardizing most companies' viability. Also, reinsurers are expected to absorb some of the damage; companies with higher attachment points for reinsurance see a more severe loss experience in this scenario. Another mitigating factor is the ability to rely on other lines of business that are not exposed to convective storm losses, helping to mute the overall impact on earnings for diversified carriers.

This scenario aligns with a clear trend over time that shows an observed increase in aggregate annual loss (AAL), with the majority of the losses realized by the primary insurer, not the reinsurer. The scenario tested was based on projecting forward the trends observed in more than 60 years of meteorological data and resulted in an industrywide increase in gross annual average insured SCS losses of USD 2.3 billion.

Of these additional losses, USD 300 million–USD 350 million are expected to be absorbed by carriers' in-force catastrophe reinsurance programs, with a similar proportion covered by underlying quota share and per risk structures.[8] These are annual average costs, and the increases in high storm activity years were significantly greater but also more disproportionately retained by reinsurers than by primary writers. As catastrophe model vendors and reinsurers begin to adjust their expectations for the SCS peril, reinsurance cost may be adjusted to reflect this increased exposure, which will put pressure on carriers to price for true convective storm risk more precisely on a policy-by-policy level.

The increased frequency of storms is an ongoing concern for insurers. An earlier start to the convective season with a heavier concentration of losses in the spring and more volatile weather patterns means greater frequency and potential severity of losses for insurers to handle. Future success for property writers with respect to increasing frequency and severity of weather losses will come from achieving enough rate for each risk to compensate for increased losses.

Building code enhancements can help make communities more resilient and over time help to keep rates affordable for consumers and business owners. Collaboration between local government and building regulators to enhance code enforcement can ensure that infrastructure is built to withstand increasing weather events and protect those that need the coverage most. NAMIC is a leader in the BuildStrong Coalition, which advocates for increased durability through stronger code enforcement.

ASSUMPTIONS

What could cause this scenario? Over the past several years, the U.S. has experienced a shift in the frequency, severity, and variety of severe weather events. As urban centers grow denser, suburban zones spread farther from city centers, and people continue to build along the coast, the exposure to financial loss from catastrophic weather events increases. Increasing fluctuations in weather events cause some years to be more extreme than the historical experience. This scenario leverages academic engagements with leading experts in meteorology to project regional trends in both hailstorms and tornadoes and measure what effect these trends could mean for insurers.

The catastrophe models in use today leverage historic data and may not be accurately capturing the trends of recent years. For example, the SCS models in use today leverage historical weather data from nearly 10 years ago, while the past decade has been the most active in history for insured SCS losses. It is possible that the recent rise in natural peril activity is a temporary phenomenon, and there will be a return to the long-term averages soon. However, there is sufficient evidence in recent years of emerging trends to be considered. In this scenario test, the "what if?" is modeled on what would happen if trends of more frequent and severe convective storm events continue over the coming year.

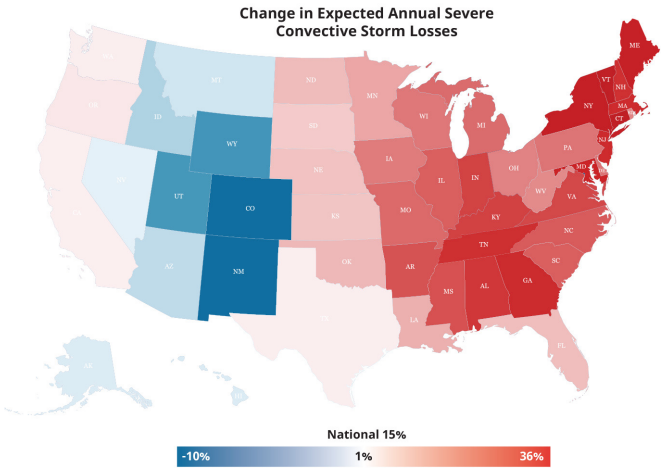
Recent academic data from Northern Illinois University provides insights into evolving trends in tornado and hail environments related to days when tornado and hail activities are known to have occurred. The change in environments is one measure of changing physical SCS risk. These trends are expressed on a decadal basis and normalized to the state level.

As a scenario test these trends have been integrated into the SCS model output. If it is assumed that the resulting state-level trends observed are significant, it could be estimated that the impact of applying the hail trend to a nationwide book would be 22.8% higher hail AAL, which would translate to a 3.0% overall SCS AAL, assuming the other sub-perils remain unchanged.

[8] Property Per Risk: also known as specific, working layer, or underlying excess of loss reinsurance. A method by which an insurer may recover losses on an individual risk in excess of a specific per risk retention (Source: IRMI).

The range of impacts by state is from -24% to +78% for hail only, and -12% to +27% when compared against SCS in total. The change is not overly dramatic on a nationwide basis but will be sharper for portions of the Midwest and the Interstate 95 corridor, where the population concentrations are quite high. Additionally, an increased expected severity to tornadoes has been layered on using a similar process. The impact of increased tornado and hail losses together is a 5.1% higher SCS AAL nationwide, with total state impact ranging from -3.5% to +13%. The resulting factors are applied, with a factor of 3, for those stochastic events that produce significant hail or tornadoes. The result is an estimate of adjusted risk, consistent with observed trends, projected 30 years forward from the original calibration baseline of the SCS model.

Chart 18. Map of multiplicative changes to Severe Storm Annual Losses



Climate Trend: Several hazards that cause concern will evolve with the changing climate. From a property perspective, among the greatest threats is sea-level rise, which will shorten the return periods of seawater inundation events from hurricanes as well as nor'easters. Additionally, intense rainfall events will increase both the frequency and severity of freshwater flooding events.

Hurricane intensity and hurricane rainfall are projected to increase over time, although frequency projections are unclear. Severe thunderstorm trends are subtle, with an earlier start and a more intense spring most probable, along with more clustered tornado events and an increase in severe hail events. Prolonged duration of hot and dry conditions will amplify the wildfire threat for many areas of the U.S. Finally, it is believed that as weather patterns become more persistent, the potential for prolonged duration events would drift upward in frequency.

OVERVIEW OF SCS SCENARIO RESULTS

The impact of an increased SCS season on the insurance industry is largely an earnings volatility event. Industrywide increased loss to surplus is projected at USD 1.8 billion, with half of that amount going to mutual companies. Furthermore, few companies were pushed over the 0% ROS threshold, holding steady for all companies at 27% expected to have a loss of surplus. In the baseline scenario, 24% of mutuals are expected to have a loss of surplus, while 25% can expect a loss in the severe convective storm scenario. Key observations from the results for the severe convective storm scenario test are highlighted below; the full detailed table of results is available in the appendix:

Region: Midwestern and Southern regions were most impacted. Five percent of Midwestern carriers dropped from the top performing risk and volatility cluster, while 31% were able to remain in the top performing cluster even after this scenario testing. A few Southern companies also dropped out of the top performing cluster, but most were able to withstand the scenario test without a drop in performance metrics by peers. These movements by region reflect the changing trends in AAL from weather by state and the underlying exposure by state.

Line of Business: Personal lines took the greatest hit from increased storms, followed by commercial lines. Three percent of personal lines dropped from the highest performing cluster, while still 25% of personal lines remained in the top performing cluster.

SCENARIO TEST 5 – REINSURANCE MARKET

KEY FINDINGS

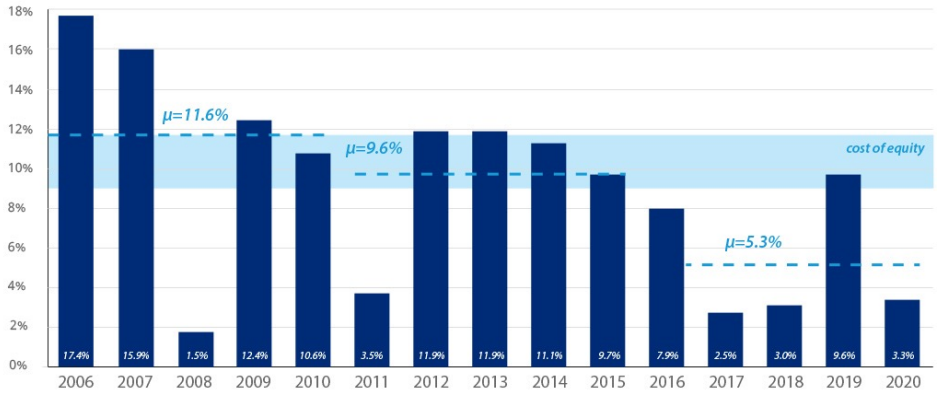
A hardening of the reinsurance market would result in USD 3.2 billion in industry surplus loss due to increased ceded premium expenses. Industrywide ROS drops by 0.8%; however, this impact is not felt consistently across company type and business focus. Companies most vulnerable to the reinsurance scenario testing are those that utilize reinsurance as part of their capital structure. While the model results showed the largest companies having the greatest chance of dropping in performance as a result of the increased reinsurance costs, the model does not take into account management's ability to change the level of reinsurance utilized. Southeastern companies as well as commercial and property specialist writers also showed the greatest propensity for drops in performance.

An unexpected jump in the cost of reinsurance would cause a slight disruption to the industry. This scenario resulted in an additional 14% of insurers expecting to lose surplus for the year, with the number of insureds expecting to lose more than 10% of surplus doubling to 17% of the industry overall. Less than 1 in 16 companies would expect loss of surplus in excess of 25%, compared to 1 in 42 for the baseline scenario.

ASSUMPTIONS

What could cause this scenario? Capacity of reinsurance capital shrinks due to low returns that are not covering the cost of capital. Due to rating agency capital requirements, most insurers would be obliged to continue buying coverage but at rate-level percentages higher than anticipated. This increased expense flows through to the financial statements, lowering policyholders surplus and increasing the net combined ratio.

Chart 19. GC Global Reinsurance Composite Returns on Equity Have Declined Over the Last 15 Years

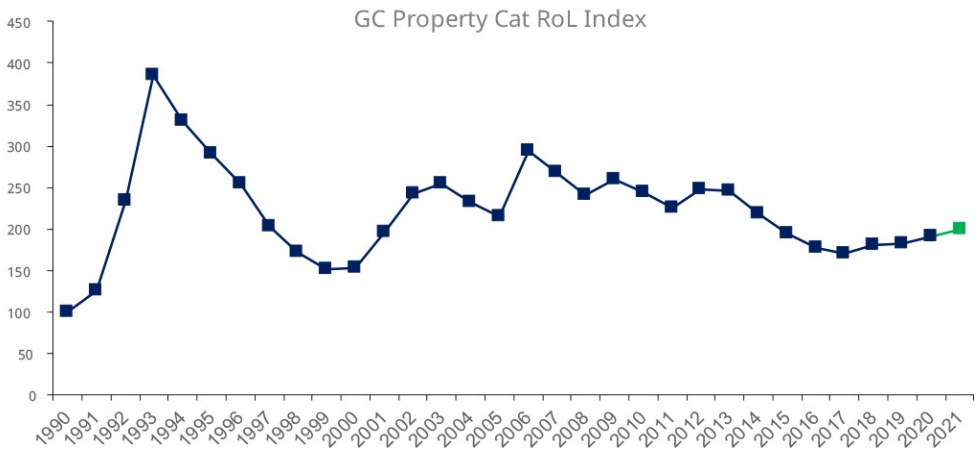


Source: Guy Carpenter Business Intelligence

Reinsurance pricing for most types of coverage has recently enjoyed relative stability. However, rating agencies are concerned that a large disruption or spike in pricing could materially affect insurers' financial performance. In the hardening reinsurance market scenario testing, it is assumed reinsurance rates increase 15% across all lines and regions. With most NAMIC members depending on reinsurance as part of their capital structure, they will be required to buy reinsurance coverage even at the increased price levels. The increased reinsurance cost will result in a near-term increase in net combined ratios.

Chart 20 shows a gradual market hardening since 2017 but remains well below historic hard-market levels

Chart 20. GC Global Property Cat Rate on Line (RoL) Index



OVERVIEW OF REINSURANCE SCENARIO RESULTS

The impact to the industry of a hardening reinsurance scenario is appreciable; however, it is not as significant as inflation or a recession. Overall, companies experienced reinsurance hardening as an earnings volatility event. Stock and high-performing companies are most vulnerable to change in surplus resulting from this scenario. Key observations from the results for a reinsurance hardening market are highlighted below; the full detailed table of results is available in the appendix:

Size: Companies of all sizes would expect reduced profitability from higher reinsurance costs, with the median company expecting a 3% reduction in expected return on surplus. Among all sizes of carriers, the 10% of companies with the highest use of ceded reinsurance can expect a decline in ROS of 12% or more. Smaller companies are more likely to view their reinsurance program as a compulsory piece of their capital structure and may have less flexibility to reduce capacity placed into a harder market. Larger carriers with high levels of ceded reinsurance may view parts of their program as tactical or arbitrage buys and, therefore, have the flexibility to pare back cover and replace it with other forms of capital if market conditions were to change.

Region: Writers of property in the Southeast region have the greatest reliance on reinsurance and can be expected to see the greatest effect if the price of their coverage were to increase. Nineteen percent of Southeast regional carriers are projected to move from a high-return cluster to a low-return cluster, while others only expect 8% - 9% of regional writers in other parts of the country move from a high- to low-return cluster.

Company Structure: Stock companies often utilize inexpensive reinsurance to enhance returns on investor capital. If reinsurance market conditions hardened as this scenario projects, 18% of stock companies would fall from a high-return to low-return cluster, versus only 8% of mutuals.

Line of Business: Commercial lines writers and property specialists are the most reliant on reinsurance to enhance underwriting capacity. Over 20% of these carriers would move from a high-return to a low-return cluster if reinsurance market conditions were to become less favorable. Workers' compensation writers are among the least dependent on reinsurance, and they would expect to see only a minor effect from even a significant hardening in reinsurance rates.

CONCLUSION

The pandemic has introduced a new dimension of uncertainty for P/C companies, while accelerating fundamental shifts across the global economy. Given this greater level of uncertainty, it has become critical that management teams understand the possible impacts to their business from a range of potential scenarios they could face in the coming years. Companies that are proactive in scenario testing their plan will be better positioned to react to potential issues before they become balance sheet concerns and to take advantage of opportunities when presented. For most NAMIC members, capital is extremely strong and most scenarios by themselves are tolerable from a balance sheet perspective; however, heightened focus on operating performance from AM Best means events that impact a company's earnings to a greater extent than their peers also require attention from a ratings perspective. Increasingly, AM Best is placing the responsibility on management for defining stress events to determine their company's susceptibility to key risks. By first measuring exposure, companies are better positioned to outline their tolerance for earnings that deviate from their plan in stressed operating environments and to develop a plan of action in case a tolerance threshold is breached.

In this report, we have outlined an approach for management to take ownership of potential scenarios impacting their company. Results from the five scenario tests outlined range from minimal earnings events to dramatic shifts in surplus levels, both on an aggregate industry-level and by individual company performance. Through a detailing of the methodology and analyses, we are providing an unparalleled perspective and foresight into the health and risk factors for the U.S. P/C industry. Innovations in capital modeling allow for valuable insights into the best estimate of future performance for P/C companies, with probabilistic and deterministic distributions highlighting how possible future operating environments would likely effect multiple dimensions of performance. Modeling future returns across company segments allows for additional insights on which company characteristics are most associated with vulnerability to inflation, recession, cyber, convective storms, or a hardening reinsurance market. It is our hope that readers can gain insights into capital modeling and scenario testing through this research. These additional perspectives on future capital states under various unexpected operating environments will help management to prepare for an unknown future and communicate these risk outlooks to various stakeholders.

As is often said, "enterprise risk management is a journey, not a destination." Capital modeling is the compass on that journey. It provides insights and guidance on the sensitivities of capital and earnings against a backdrop of unknowns to inform management's strategic decisions while providing a basis for communicating direction to the board of directors, rating agencies, and regulators.

The Scenario Testing Our Mutual Future report shows NAMIC members how the compass of each peer group reacts to realistic scenario testing and how those changes compare to the compass of other peer groups. Guy Carpenter and NAMIC are pleased to offer insights on company results and those of selected peers. The modeled results are not "the answer" but a starting point to understand the sensitivity of capital and earnings under duress and the result of events on each organization relative to its peers. The authors encourage readers to review individual company results to understand the impact of these scenarios on each organization's compass and inform its own view of capital.

To request individual company results, please reach out to a Guy Carpenter representative.

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APPENDIX

CLUSTERING RESULTS

Here the summary results from the clustering analysis are presented. Companies are grouped by performance cohort, which progress from the lowest performing group to highest performing group:

High Volatility, Underperforming: Each red dot represents a single company's results by the coordinates of average return on surplus vertically and the volatility of return on surplus horizontally. These represent the lowest performing cluster with high volatility and low returns.

Moderate Volatility, Underperforming: Each peach-colored dot represents a single company's results by the coordinates of average return on surplus vertically and the volatility of return on surplus horizontally. Companies in this cluster have moderate volatility and low returns.

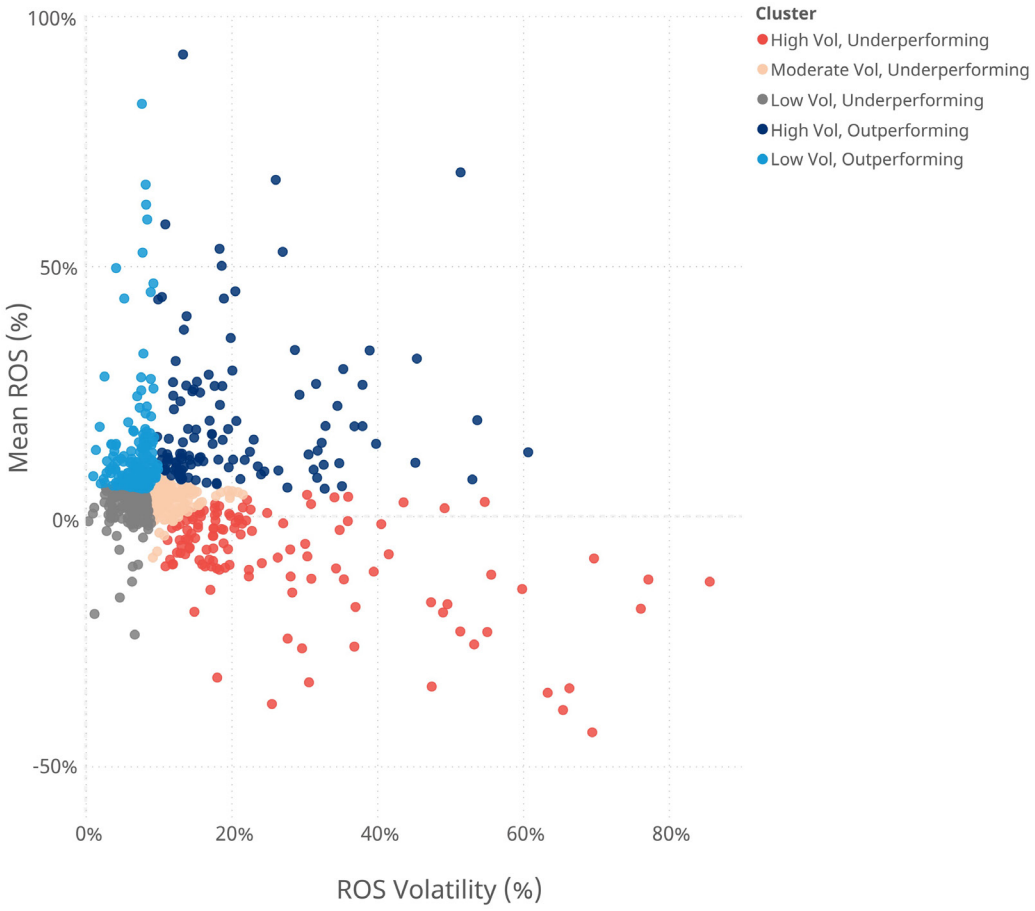
Low Volatility, Underperforming: Each gray dot represents a single company's results by the coordinates of average return on surplus vertically and the volatility of return on surplus horizontally. Companies in this cluster have low volatility but also low returns.

High Volatility, Outperforming: Each dark blue dot represents a single company's results by the coordinates of average return on surplus vertically and the volatility of return on surplus horizontally. Companies in this cluster have high volatility and high returns.

High Volatility, Outperforming: Each light blue dot represents a single company's results by the coordinates of average return on surplus vertically and the volatility of return on surplus horizontally. Companies in this cluster have low volatility and high returns, thus the highest performing cluster.

Scenario Test Cluster Results: Cluster coordinates were set for the baseline scenario results, then overlaid onto the scenario testing, thus holding consistent the performance boundaries that define each cluster. By keeping the performance characteristics consistent, insight into how companies move between the clusters helps to form understanding of how a company would handle a scenario test compared to their baseline peers.

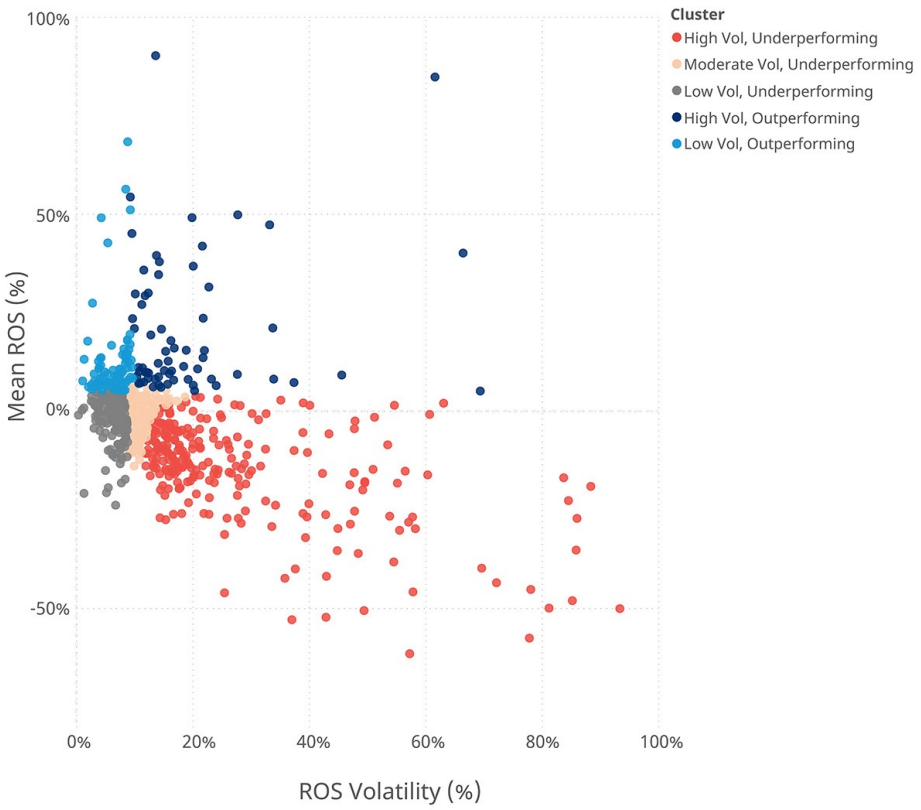
Appendix Chart 1. Cluster of Expected Company Results in Baseline Scenario



Appendix Table 1. Percent of Companies by Segment Within Each Performance Cluster, Baseline 2021 Model

Segment	High Vol, Low Return	Moderate Vol, Low Return	Low Vol, Low Return	High Vol, High Return	Low Vol, High Return	Count of Companies	% of Industry NPW
LOB Segment	**17%**	**22%**	**20%**	**16%**	**24%**	**702**	**100%**
Accident & Health Lines	14%	14%	43%	29%	0%	7	0.2%
Commercial Financial Lines	16%	0%	21%	21%	42%	19	1%
Commercial General Liability	12%	14%	26%	22%	26%	58	2%
Commercial Lines	12%	22%	17%	21%	29%	77	20%
Commercial Medical Malpractice	21%	24%	27%	18%	10%	71	1%
Commercial Property	18%	27%	15%	19%	22%	148	9%
Commercial Workers Compensation	8%	28%	29%	6%	29%	72	2%
Large Reinsurance	44%	56%	0%	0%	0%	9	4%
Personal Lines	19%	20%	18%	15%	28%	229	60%
Reinsurance	25%	17%	33%	8%	17%	12	0.0%
Company Structure	**17%**	**22%**	**20%**	**17%**	**24%**	**712**	**100%**
Mutual	13%	27%	27%	7%	27%	330	42%
Other	18%	9%	36%	36%	0%	22	0.4%
Stock	21%	18%	13%	24%	23%	360	58%
Region Segment	**17%**	**22%**	**20%**	**16%**	**24%**	**702**	**100%**
National	17%	19%	19%	19%	26%	193	78%
Regional - Midwestern	10%	19%	26%	9%	35%	110	4%
Regional - Northeastern	16%	33%	19%	14%	18%	112	2%
Regional - Southern	22%	21%	15%	18%	25%	209	9%
Regional - Western	14%	24%	31%	19%	12%	78	7%
Size Segment	**17%**	**22%**	**20%**	**17%**	**24%**	**712**	**100%**
< $20M	22%	23%	25%	18%	12%	186	1%
$20 - $100M	16%	21%	21%	17%	26%	214	1%
$100-$500M	16%	21%	20%	17%	27%	180	6%
$500M - $2B	14%	25%	13%	17%	31%	84	12%
> $2B	15%	23%	8%	10%	44%	48	80%

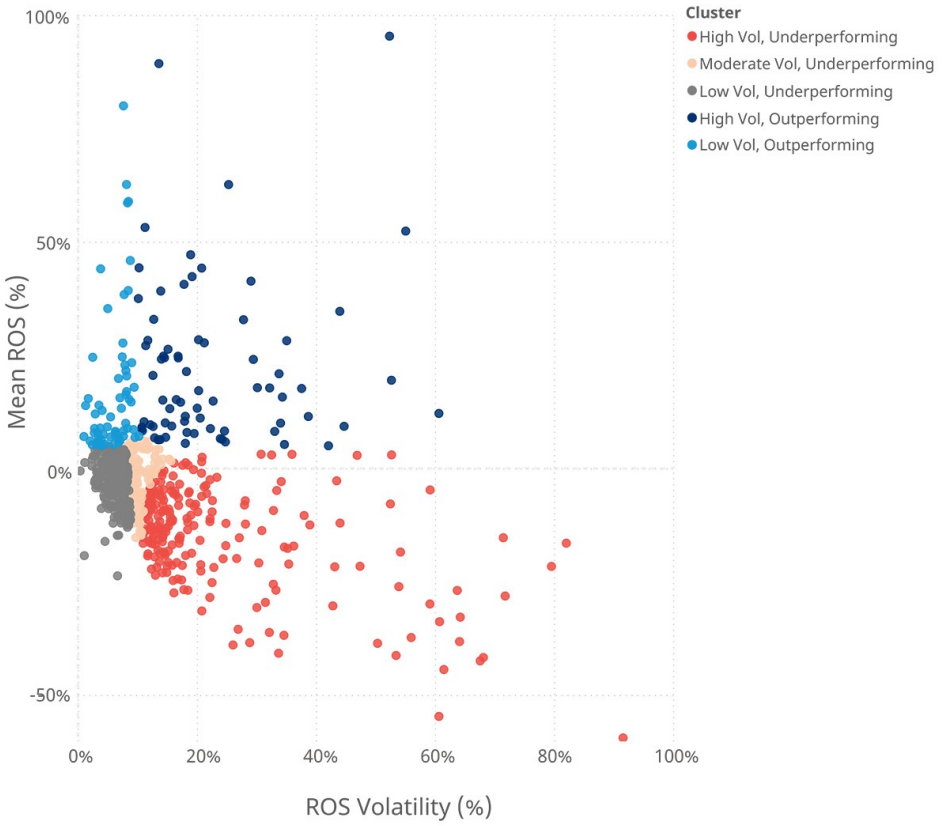
Appendix Chart 2. Cluster of Expected Company Results in Inflation Scenario Testing



Appendix Table 2. Change in Percent of Companies by Segment Within Each Performance Cluster, Inflation Scenario Testing

Segment	High Vol, Low Return	Moderate Vol, Low Return	Low Vol, Low Return	High Vol, High Return	Low Vol, High Return
LOB Segment	**17%**	**1%**	**2%**	**-7%**	**-13%**
Accident & Health Lines	14%	0%	0%	-14%	0%
Commercial Financial Lines	-1%	0%	4%	9%	-12%
Commercial General Liability	26%	2%	-5%	-10%	-12%
Commercial Lines	18%	3%	1%	-6%	-16%
Commercial Medical Malpractice	27%	-1%	-2%	-15%	-8%
Commercial Property	18%	2%	1%	-9%	-11%
Commercial Workers' Compensation	23%	-4%	10%	-6%	-24%
Large Reinsurance	56%	-56%	0%	0%	0%
Personal Lines	10%	6%	5%	-5%	-15%
Reinsurance	25%	0%	-17%	-8%	0%
Company Structure	**17%**	**1%**	**2%**	**-7%**	**-13%**
Mutual	12%	3%	4%	-3%	-17%
Other	27%	6%	-1%	-31%	0%
Stock	21%	-1%	0%	-10%	-11%
Region Segment	**17%**	**1%**	**2%**	**-7%**	**-13%**
National	24%	0%	2%	-10%	-15%
Regional - Midwestern	12%	4%	7%	-2%	-21%
Regional - Northeastern	21%	-3%	4%	-11%	-12%
Regional - Southern	12%	3%	3%	-5%	-12%
Regional - Western	19%	5%	-8%	-9%	-8%
Size Segment	**17%**	**1%**	**2%**	**-7%**	**-13%**
< $20M	16%	0%	-2%	-9%	-5%
$20 - $100M	16%	0%	1%	-7%	-10%
$100-$500M	16%	2%	2%	-6%	-14%
$500M - $2B	25%	-5%	11%	-6%	-25%
> $2B	21%	21%	6%	-8%	-40%

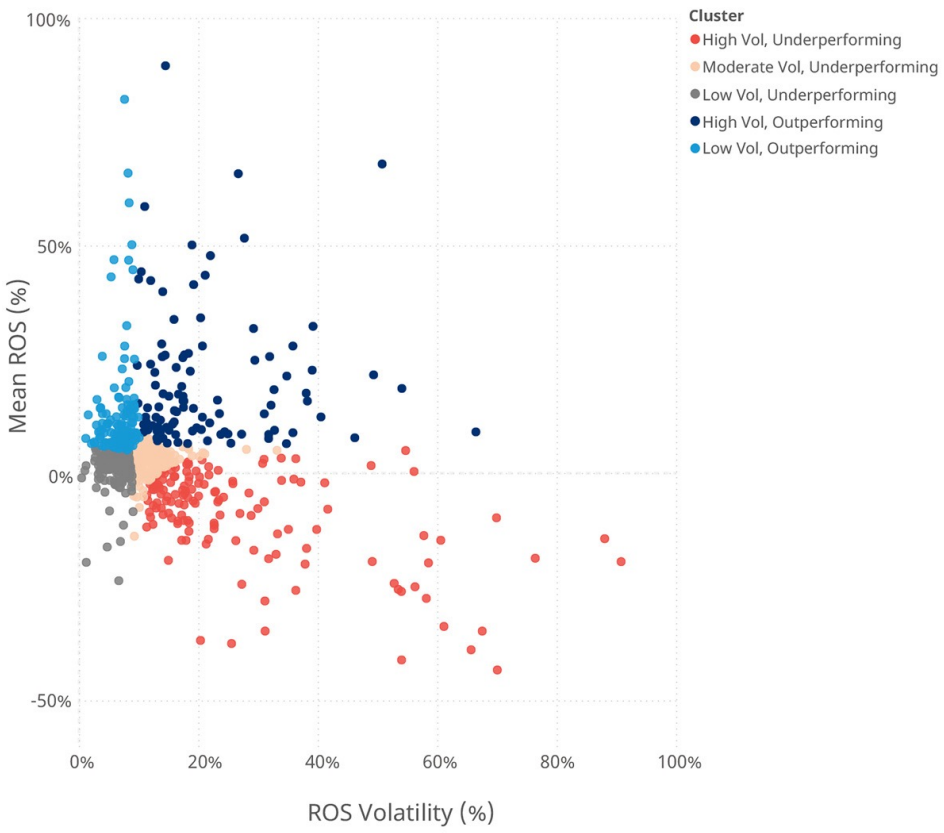
Appendix Chart 3. Cluster of Expected Company Results in Recession Scenario Testing



Appendix Table 3. Change in Percent of Companies by Segment Within Each Performance Cluster, Recession Scenario Testing

Segment	High Vol, Low Return	Moderate Vol, Low Return	Low Vol, Low Return	High Vol, High Return	Low Vol, High Return
LOB Segment	**13%**	**-6%**	**13%**	**-6%**	**-15%**
Accident & Health Lines	14%	-14%	14%	-14%	0%
Commercial Financial Lines	-1%	10%	19%	-6%	-22%
Commercial General Liability	13%	-3%	7%	-6%	-11%
Commercial Lines	16%	-7%	17%	-11%	-15%
Commercial Medical Malpractice	16%	-8%	10%	-8%	-10%
Commercial Property	18%	-9%	10%	-7%	-12%
Commercial Workers' Compensation	18%	-5%	13%	-6%	-21%
Large Reinsurance	22%	-33%	11%	0%	0%
Personal Lines	8%	-3%	18%	-3%	-20%
Reinsurance	30%	-17%	-6%	-8%	2%
Company Structure	**13%**	**-6%**	**13%**	**-6%**	**-15%**
Mutual	13%	-8%	21%	-3%	-22%
Other	9%	-5%	0%	-9%	5%
Stock	14%	-3%	8%	-8%	-10%
Region Segment	**13%**	**-6%**	**13%**	**-6%**	**-15%**
National	18%	-5%	13%	-12%	-14%
Regional - Midwestern	12%	-4%	23%	-1%	-30%
Regional - Northeastern	14%	-8%	14%	-5%	-15%
Regional - Southern	10%	-6%	13%	-3%	-13%
Regional - Western	13%	-7%	4%	-6%	-4%
Size Segment	**13%**	**-6%**	**13%**	**-6%**	**-15%**
< $20M	15%	-7%	7%	-8%	-6%
$20 - $100M	12%	-3%	11%	-5%	-15%
$100-$500M	11%	-5%	13%	-6%	-14%
$500M - $2B	18%	-10%	23%	-6%	-25%
> $2B	17%	-6%	31%	-6%	-35%

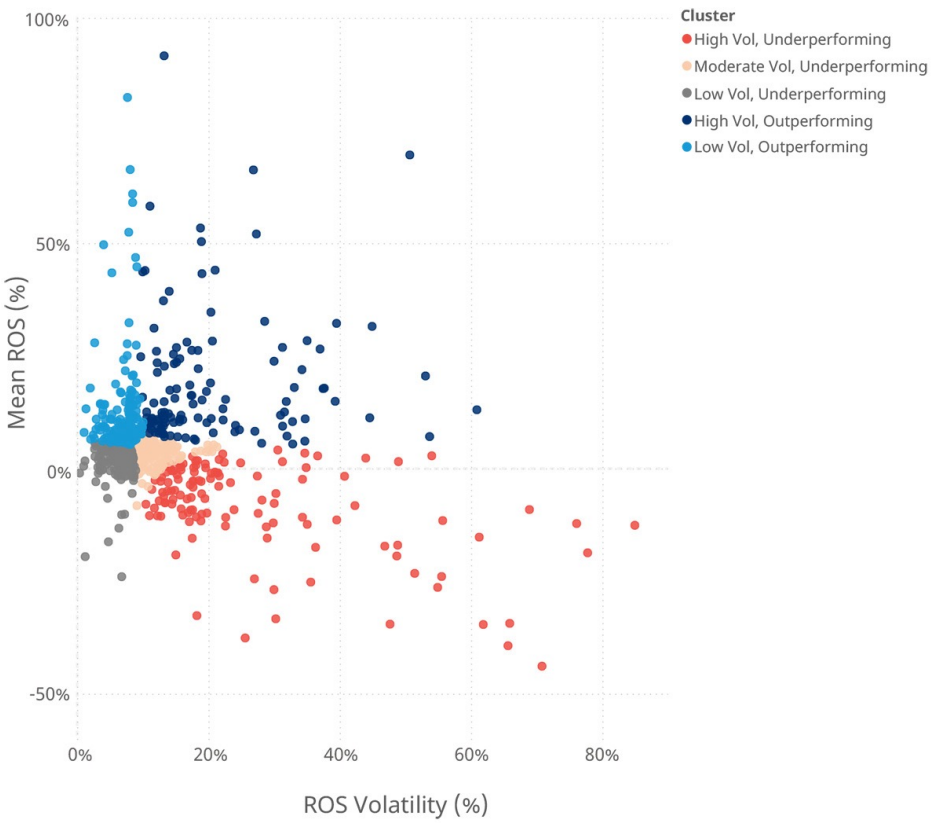
Appendix Chart 4. Cluster of Expected Company Results in Cyber Scenario Testing



Appendix Table 4. Change in Percent of Companies by Segment Within Each Performance Cluster, Cyber Scenario Testing

Segment	High Vol, Low Return	Moderate Vol, Low Return	Low Vol, Low Return	High Vol, High Return	Low Vol, High Return
LOB Segment	**2%**	**2%**	**1%**	**-2%**	**-3%**
Accident & Health Lines	0%	29%	0%	-29%	0%
Commercial Financial Lines	5%	21%	-11%	0%	-16%
Commercial General Liability	2%	7%	0%	-7%	-2%
Commercial Lines	4%	1%	3%	-4%	-4%
Commercial Medical Malpractice	0%	1%	1%	-3%	0%
Commercial Property	3%	4%	2%	-3%	-6%
Commercial Workers' Compensation	1%	-1%	1%	0%	-1%
Large Reinsurance	11%	-11%	0%	0%	0%
Personal Lines	1%	-1%	1%	0%	-1%
Reinsurance	8%	0%	0%	-8%	0%
Company Structure	**2%**	**2%**	**1%**	**-2%**	**-3%**
Mutual	2%	1%	2%	-1%	-3%
Other	0%	5%	0%	-5%	0%
Stock	3%	3%	0%	-3%	-3%
Region Segment	**2%**	**2%**	**1%**	**-2%**	**-3%**
National	4%	7%	1%	-7%	-5%
Regional - Midwestern	2%	2%	3%	-1%	-5%
Regional - Northeastern	3%	0%	2%	-1%	-4%
Regional - Southern	1%	0%	1%	0%	-1%
Regional - Western	0%	0%	-1%	0%	1%
Size Segment	**2%**	**2%**	**1%**	**-2%**	**-3%**
< $20M	3%	3%	-2%	-3%	-1%
$20 - $100M	0%	2%	2%	-1%	-3%
$100-$500M	2%	2%	1%	-3%	-2%
$500M - $2B	5%	1%	2%	-2%	-6%
> $2B	4%	0%	4%	-2%	-6%

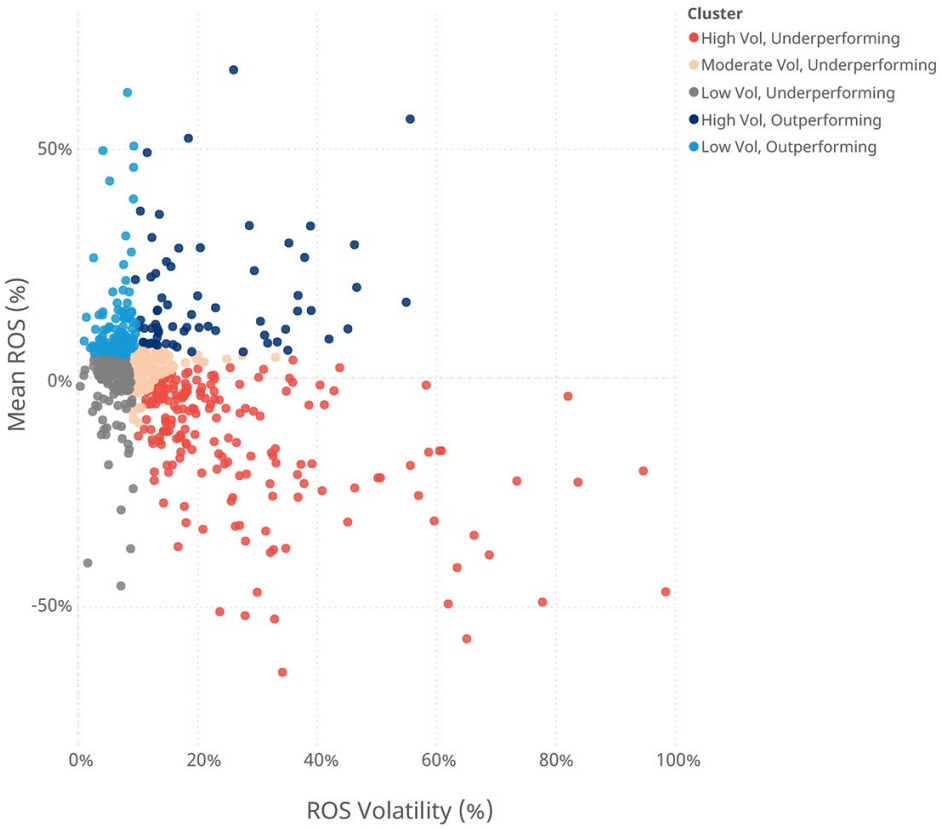
Appendix Chart 5. Cluster of Expected Company Results in Severe Weather Scenario Testing



Appendix Table 5. Change in Percent of Companies by Segment Within Each Performance Cluster, Severe Weather Scenario Testing

Segment	High Vol, Low Return	Moderate Vol, Low Return	Low Vol, Low Return	High Vol, High Return	Low Vol, High Return
LOB Segment	**0%**	**0%**	**0%**	**0%**	**-1%**
Accident & Health Lines	0%	0%	0%	0%	0%
Commercial Financial Lines	0%	0%	0%	0%	0%
Commercial General Liability	0%	2%	-2%	0%	0%
Commercial Lines	0%	0%	0%	0%	0%
Commercial Medical Malpractice	0%	0%	0%	0%	0%
Commercial Property	0%	1%	0%	0%	-1%
Commercial Workers' Compensation	0%	0%	0%	0%	0%
Large Reinsurance	0%	0%	0%	0%	0%
Personal Lines	1%	0%	1%	1%	-3%
Reinsurance	0%	0%	0%	0%	0%
Company Structure	**0%**	**0%**	**0%**	**0%**	**-1%**
Mutual	1%	1%	0%	0%	-2%
Other	0%	0%	0%	0%	0%
Stock	0%	0%	0%	1%	-1%
Region Segment	**0%**	**0%**	**0%**	**0%**	**-1%**
National	0%	0%	0%	1%	-1%
Regional - Midwestern	0%	3%	2%	0%	-5%
Regional - Northeastern	0%	0%	0%	0%	0%
Regional - Southern	1%	0%	0%	0%	-1%
Regional - Western	0%	0%	0%	0%	0%
Size Segment	**0%**	**0%**	**0%**	**0%**	**-1%**
< $20M	1%	-1%	0%	0%	0%
$20 - $100M	0%	0%	0%	0%	-2%
$100-$500M	0%	1%	0%	1%	-1%
$500M - $2B	1%	1%	0%	0%	-2%
> $2B	0%	0%	0%	0%	0%

Appendix Chart 6. Cluster of Expected Company Results in Reinsurance Scenario Testing



Appendix Table 6. Change in Percent of Companies by Segment Within Each Performance Cluster, Reinsurance Scenario Testing

Segment	High Vol, Low Return	Moderate Vol, Low Return	Low Vol, Low Return	High Vol, High Return	Low Vol, High Return
LOB Segment	**9%**	**2%**	**2%**	**-7%**	**-6%**
Accident & Health Lines	0%	0%	0%	0%	0%
Commercial Financial Lines	-1%	5%	4%	-1%	-7%
Commercial General Liability	9%	3%	-2%	-7%	-3%
Commercial Lines	12%	2%	8%	-14%	-8%
Commercial Medical Malpractice	1%	3%	0%	-3%	-1%
Commercial Property	13%	4%	3%	-11%	-9%
Commercial Workers Compensation	3%	-1%	0%	0%	-1%
Large Reinsurance	33%	-33%	0%	0%	0%
Personal Lines	12%	2%	2%	-8%	-8%
Reinsurance	0%	0%	0%	0%	0%
Company Structure	**9%**	**2%**	**2%**	**-7%**	**-6%**
Mutual	2%	4%	2%	-2%	-6%
Other	0%	9%	0%	-9%	0%
Stock	16%	-1%	3%	-12%	-6%
Region Segment	**9%**	**2%**	**2%**	**-7%**	**-6%**
National	9%	3%	3%	-8%	-7%
Regional - Midwestern	2%	5%	2%	-3%	-5%
Regional - Northeastern	7%	-1%	4%	-4%	-5%
Regional - Southern	16%	0%	2%	-11%	-7%
Regional - Western	6%	3%	0%	-8%	-1%
Size Segment	**9%**	**2%**	**2%**	**-7%**	**-6%**
< $20M	5%	1%	1%	-5%	-2%
$20 - $100M	10%	3%	1%	-8%	-6%
$100-$500M	11%	1%	4%	-9%	-7%
$500M - $2B	14%	-1%	4%	-8%	-8%
> $2B	8%	6%	4%	-4%	-15%

Appendix Table 7. Percent of Companies by Segment Within Each Performance Cluster, Baseline 2021

Segment	High Vol, Low Return	Moderate Vol, Low Return	Low Vol, Low Return	High Vol, High Return	Low Vol, High Return	Count of Companies	% of Industry NPW
LOB Segment	**17%**	**22%**	**20%**	**16%**	**24%**	**702**	**100%**
Accident & Health Lines	14%	14%	43%	29%	0%	7	0.2%
Commercial Financial Lines	16%	0%	21%	21%	42%	19	1%
Commercial General Liability	12%	14%	26%	22%	26%	58	2%
Commercial Lines	12%	22%	17%	21%	29%	77	20%
Commercial Medical Malpractice	21%	24%	27%	18%	10%	71	1%
Commercial Property	18%	27%	15%	19%	22%	148	9%
Commercial Workers Compensation	8%	28%	29%	6%	29%	72	2%
Large Reinsurance	44%	56%	0%	0%	0%	9	4%
Personal Lines	19%	20%	18%	15%	28%	229	60%
Reinsurance	25%	17%	33%	8%	17%	12	0.0%
Company Structure	**17%**	**22%**	**20%**	**17%**	**24%**	**712**	**100%**
Mutual	13%	27%	27%	7%	27%	330	42%
Other	18%	9%	36%	36%	0%	22	0.4%
Stock	21%	18%	13%	24%	23%	360	58%
Region Segment	**17%**	**22%**	**20%**	**16%**	**24%**	**702**	**100%**
National	17%	19%	19%	19%	26%	193	78%
Regional - Midwestern	10%	19%	26%	9%	35%	110	4%
Regional - Northeastern	16%	33%	19%	14%	18%	112	2%
Regional - Southern	22%	21%	15%	18%	25%	209	9%
Regional - Western	14%	24%	31%	19%	12%	78	7%
Size Segment	**17%**	**22%**	**20%**	**17%**	**24%**	**712**	**100%**
< $20M	22%	23%	25%	18%	12%	186	1%
$20 - $100M	16%	21%	21%	17%	26%	214	1%
$100-$500M	16%	21%	20%	17%	27%	180	6%
$500M - $2B	14%	25%	13%	17%	31%	84	12%
> $2B	15%	23%	8%	10%	44%	48	80%

Appendix Table 8. Percent of Companies by Segment Within Each Performance Cluster, Inflation Scenario Testing

Segment	High Vol, Low Return	Moderate Vol, Low Return	Low Vol, Low Return	High Vol, High Return	Low Vol, High Return	Count of Companies	% of Industry NPW
LOB Segment	**34%**	**24%**	**22%**	**9%**	**11%**	**699**	**100%**
Accident & Health Lines	29%	14%	43%	14%	0%	7	0.2%
Commercial Financial Lines	15%	0%	25%	30%	30%	20	1%
Commercial General Liability	38%	16%	21%	12%	14%	58	2%
Commercial Lines	30%	25%	18%	14%	13%	77	20%
Commercial Medical Malpractice	48%	23%	25%	3%	1%	69	1%
Commercial Property	36%	29%	16%	10%	10%	147	9%
Commercial Workers Compensation	31%	24%	39%	0%	6%	71	2%
Large Reinsurance	100%	0%	0%	0%	0%	9	4%
Personal Lines	29%	26%	23%	10%	13%	229	60%
Reinsurance	50%	17%	17%	0%	17%	12	0.0%
Company Structure	**34%**	**23%**	**22%**	**9%**	**11%**	**708**	**100%**
Mutual	25%	30%	31%	4%	10%	329	42%
Other	45%	15%	35%	5%	0%	20	0.4%
Stock	43%	18%	13%	15%	12%	359	58%
Region Segment	**34%**	**24%**	**22%**	**9%**	**11%**	**699**	**100%**
National	40%	18%	21%	9%	11%	192	78%
Regional - Midwestern	22%	23%	33%	7%	15%	109	4%
Regional - Northeastern	38%	30%	22%	4%	6%	112	2%
Regional - Southern	34%	23%	18%	13%	13%	208	9%
Regional - Western	33%	29%	23%	10%	4%	78	7%
Size Segment	**34%**	**23%**	**22%**	**9%**	**11%**	**708**	**100%**
< $20M	38%	23%	23%	9%	7%	183	1%
$20 - $100M	32%	21%	22%	9%	16%	213	1%
$100-$500M	32%	22%	22%	11%	13%	180	6%
$500M - $2B	39%	20%	24%	11%	6%	84	12%
> $2B	35%	44%	15%	2%	4%	48	80%

Appendix Table 9. Percent of Companies by Segment Within Each Performance Cluster, Recession Scenario Testing

Segment	High Vol, Low Return	Moderate Vol, Low Return	Low Vol, Low Return	High Vol, High Return	Low Vol, High Return	Count of Companies	% of Industry NPW
LOB Segment	**30%**	**17%**	**34%**	**10%**	**9%**	**682**	**100%**
Accident & Health Lines	29%	0%	57%	14%	0%	7	0.2%
Commercial Financial Lines	15%	10%	40%	15%	20%	20	1%
Commercial General Liability	25%	11%	33%	16%	15%	55	2%
Commercial Lines	27%	15%	34%	10%	14%	73	20%
Commercial Medical Malpractice	37%	16%	37%	10%	0%	68	1%
Commercial Property	36%	18%	25%	12%	9%	140	9%
Commercial Workers' Compensation	27%	23%	42%	0%	8%	71	2%
Large Reinsurance	67%	22%	11%	0%	0%	9	4%
Personal Lines	27%	18%	36%	12%	8%	228	60%
Reinsurance	55%	0%	27%	0%	18%	11	0.0%
Company Structure	**31%**	**16%**	**33%**	**11%**	**9%**	**691**	**100%**
Mutual	25%	19%	47%	3%	5%	318	42%
Other	27%	5%	36%	27%	5%	22	0.4%
Stock	35%	15%	21%	16%	13%	351	58%
Region Segment	**30%**	**17%**	**33%**	**10%**	**9%**	**682**	**100%**
National	34%	14%	32%	7%	13%	190	78%
Regional - Midwestern	22%	15%	49%	8%	6%	104	4%
Regional - Northeastern	30%	25%	33%	9%	3%	110	2%
Regional - Southern	32%	15%	27%	14%	11%	201	9%
Regional - Western	27%	17%	35%	13%	8%	77	7%
Size Segment	**31%**	**16%**	**33%**	**11%**	**9%**	**691**	**100%**
< $20M	37%	16%	32%	10%	5%	166	1%
$20 - $100M	28%	17%	32%	12%	10%	213	1%
$100-$500M	27%	16%	33%	11%	13%	180	6%
$500M - $2B	32%	15%	36%	11%	6%	84	12%
> $2B	31%	17%	40%	4%	8%	48	80%

Appendix Table 10. Percent of Companies by Segment Within Each Performance Cluster, Cyber Scenario Testing

Segment	High Vol, Low Return	Moderate Vol, Low Return	Low Vol, Low Return	High Vol, High Return	Low Vol, High Return	Count of Companies	% of Industry NPW
LOB Segment	**19%**	**24%**	**21%**	**14%**	**22%**	**702**	**100%**
Accident & Health Lines	14%	43%	43%	0%	0%	7	0.2%
Commercial Financial Lines	21%	21%	11%	21%	26%	19	1%
Commercial General Liability	14%	21%	26%	16%	24%	58	2%
Commercial Lines	16%	23%	19%	17%	25%	77	20%
Commercial Medical Malpractice	21%	25%	28%	15%	10%	71	1%
Commercial Property	21%	31%	17%	16%	16%	148	9%
Commercial Workers' Compensation	10%	26%	31%	6%	28%	72	2%
Large Reinsurance	56%	44%	0%	0%	0%	9	4%
Personal Lines	20%	19%	19%	15%	27%	229	60%
Reinsurance	33%	17%	33%	0%	17%	12	0.0%
Company Structure	**19%**	**24%**	**21%**	**14%**	**21%**	**712**	**100%**
Mutual	14%	28%	29%	5%	24%	330	42%
Other	18%	14%	36%	32%	0%	22	0.4%
Stock	24%	21%	13%	21%	21%	360	58%
Region Segment	**19%**	**24%**	**21%**	**14%**	**22%**	**702**	**100%**
National	21%	25%	20%	12%	22%	193	78%
Regional - Midwestern	12%	21%	29%	8%	30%	110	4%
Regional - Northeastern	19%	33%	21%	13%	14%	112	2%
Regional - Southern	23%	20%	16%	17%	24%	209	9%
Regional - Western	14%	24%	29%	19%	13%	78	7%
Size Segment	**19%**	**24%**	**21%**	**14%**	**21%**	**712**	**100%**
< $20M	25%	26%	24%	15%	11%	186	1%
$20 - $100M	16%	22%	23%	16%	22%	214	1%
$100-$500M	18%	23%	21%	13%	25%	180	6%
$500M - $2B	19%	26%	15%	14%	25%	84	12%
> $2B	19%	23%	13%	8%	38%	48	80%

Appendix Table 11. Percent of Companies by Segment Within Each Performance Cluster, Severe Weather Scenario Testing

Segment	High Vol, Low Return	Moderate Vol, Low Return	Low Vol, Low Return	High Vol, High Return	Low Vol, High Return	Count of Companies	% of Industry NPW
LOB Segment	**17%**	**23%**	**20%**	**17%**	**23%**	**702**	**100%**
Accident & Health Lines	14%	14%	43%	29%	0%	7	0.2%
Commercial Financial Lines	16%	0%	21%	21%	42%	19	1%
Commercial General Liability	12%	16%	24%	22%	26%	58	2%
Commercial Lines	12%	22%	17%	21%	29%	77	20%
Commercial Medical Malpractice	21%	24%	27%	18%	10%	71	1%
Commercial Property	18%	28%	15%	19%	21%	148	9%
Commercial Workers' Compensation	8%	28%	29%	6%	29%	72	2%
Large Reinsurance	44%	56%	0%	0%	0%	9	4%
Personal Lines	21%	20%	19%	16%	25%	229	60%
Reinsurance	25%	17%	33%	8%	17%	12	0.0%
Company Structure	**18%**	**22%**	**20%**	**17%**	**23%**	**712**	**100%**
Mutual	14%	27%	27%	7%	25%	330	42%
Other	18%	9%	36%	36%	0%	22	0.4%
Stock	21%	18%	13%	25%	23%	360	58%
Region Segment	**17%**	**23%**	**20%**	**17%**	**23%**	**702**	**100%**
National	17%	19%	19%	20%	26%	193	78%
Regional - Midwestern	10%	22%	28%	9%	31%	110	4%
Regional - Northeastern	16%	33%	19%	14%	18%	112	2%
Regional - Southern	23%	20%	14%	18%	24%	209	9%
Regional - Western	14%	24%	31%	19%	12%	78	7%
Size Segment	**18%**	**22%**	**20%**	**17%**	**23%**	**712**	**100%**
< $20M	23%	23%	25%	18%	12%	186	1%
$20 - $100M	16%	21%	21%	17%	24%	214	1%
$100-$500M	16%	21%	20%	17%	26%	180	6%
$500M - $2B	15%	26%	13%	17%	29%	84	12%
> $2B	15%	23%	8%	10%	44%	48	80%

Appendix Table 12. Percent of Companies by Segment Within Each Performance Cluster, Reinsurance Scenario Testing

Segment	High Vol, Low Return	Moderate Vol, Low Return	Low Vol, Low Return	High Vol, High Return	Low Vol, High Return	Count of Companies	% of Industry NPW
LOB Segment	**26%**	**24%**	**22%**	**9%**	**18%**	**698**	**100%**
Accident & Health Lines	14%	14%	43%	29%	0%	7	0.2%
Commercial Financial Lines	15%	5%	25%	20%	35%	20	1%
Commercial General Liability	21%	17%	24%	16%	22%	58	2%
Commercial Lines	24%	24%	25%	7%	21%	76	20%
Commercial Medical Malpractice	23%	27%	27%	15%	8%	71	1%
Commercial Property	31%	31%	18%	7%	13%	147	9%
Commercial Workers' Compensation	11%	26%	29%	6%	28%	72	2%
Large Reinsurance	78%	22%	0%	0%	0%	9	4%
Personal Lines	31%	22%	20%	7%	20%	226	60%
Reinsurance	25%	17%	33%	8%	17%	12	0.0%
Company Structure	**27%**	**24%**	**22%**	**9%**	**18%**	**708**	**100%**
Mutual	15%	31%	28%	5%	21%	330	42%
Other	18%	18%	36%	27%	0%	22	0.4%
Stock	38%	17%	16%	13%	17%	356	58%
Region Segment	**26%**	**24%**	**22%**	**9%**	**18%**	**698**	**100%**
National	26%	21%	22%	11%	19%	193	78%
Regional - Midwestern	12%	24%	28%	6%	30%	110	4%
Regional - Northeastern	23%	32%	22%	10%	13%	112	2%
Regional - Southern	38%	21%	17%	7%	18%	205	9%
Regional - Western	21%	27%	31%	12%	10%	78	7%
Size Segment	**27%**	**24%**	**22%**	**9%**	**18%**	**708**	**100%**
< $20M	27%	24%	26%	13%	10%	185	1%
$20 - $100M	26%	24%	22%	8%	20%	215	1%
$100-$500M	27%	22%	24%	8%	20%	176	6%
$500M - $2B	29%	24%	17%	8%	23%	84	12%
> $2B	23%	29%	13%	6%	29%	48	80%

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