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Integrating Artificial Intelligence in Risk Management: Navigating Challenges and Exploring Risk Transfer Strategies

Multiple Choice and True or False Questions — Submit Answers Online

1. Which of the following will Artificial Intelligence not enhance?
   a. Our predictive prowess
   b. Refine risk transfer mechanisms
   c. Replacing people at work
   d. Create more resilient systems

2. Is Natural Language Processing considered Artificial Intelligence?
   a. True
   b. False

3. Which of the following insurance areas is using Artificial Intelligence?
   a. Construction
   b. Crop
   c. General Liability
   d. Warranty

4. Which of the following is not a future trend and prediction in Artificial Intelligence and Risk Management?
   a. Autonomous Risk Management systems
   b. Ethical Artificial Intelligence and regulation development
   c. Parametric solutions in new domains
   d. Non-bias of Artificial Intelligence Models

5. Contract Intelligence is an Artificial Intelligence program developed by JPMorgan Chase to review and analyze complex legal documents.
   a. True
   b. False

Establishing a Framework for Practical Data Governance and Examiner Considerations

Multiple Choice and True or False Questions — Submit Answers Online

6. In 2022 nearly how many million individuals were impacted by U.S.-based data compromises/breaches?
    a. 442 Million
    b. 422 Million
    c. 443 Million
    d. 244 Million

7. Two important components of establishing a data governance frame work are data literacy and data management?
    a. True
    b. False

8. Having one standard policy in place across the entire organization concerning the handling of data is the best way to ensure accountability, consistency and ownership over data?
    a. True
    b. False

9. The NAIC's Insurance Data Security Model Law requires insurers and other entities licensed by a state department of insurance to develop, implement and maintain an information security program based on its risk-assessment which includes which of the following?
    a. Board oversight
    b. Asset management protocols
    c. Vendor oversight
    d. All of the above

10. On Aug. 14, 2020, the NAIC adopted principles for artificial intelligence (AI) and its use. These principles are not laws and as such are not enforceable.
    a. True
    b. False

Navigating Political Turbulence: Utilizing Captive Insurance for Business Resilience in the 2024 Presidential Campaign

Multiple Choice and True or False Questions — Submit Answers Online

11. A presidential campaign can indeed prove to be a trying time for businesses due to uncertainty, market volatility and potential policy changes. To counter these challenges businesses can turn to captive insurance by providing:
    a. Tailored coverage
    b. Stability and long-term risk management
    c. Profit and tax benefits
    d. Enhanced claims handling
    e. a. and c.
    f. All of the above.

12. Traditional insurance emerges as a strategic tool to mitigate the risks associated with policy uncertainty. Captive insurance policies may not provide the flexibility required during times of rapid policy changes.
    a. True
    b. False

13. Captive insurance serves as a long-term risk management strategy, allowing businesses to weather economic turbulence by providing consistent coverage and financial stability.
    a. True
    b. False

14. Captive insurance allows businesses to directly manage and handle claims without the layers of bureaucracy often associated with traditional insurers. This direct approach ensures:
    a. Claims are addressed promptly
    b. Layers of bureaucracy
    c. Maximizes disruptions to business operations
    d. Accelerates the resolution of issues
    e. a. and d.
    f. All of the above

15. The knowledge that insureds have a customized risk management strategy in place, coupled with the potential for profit retention and tax advantages, instills a level of assurance that is invaluable during times of political turbulence.
    a. True
    b. False

The Shadow Knows, but Does Not Care …about IT Controls

Multiple Choice and True or False Questions — Submit Answers Online

16. SharePoint an example of "lowcode/nocode" development.
    a. True
    b. False

17. Data is the least valuable asset of a company.
    a. True
    b. False

18. What does the "C" in the acronym "CRUD" stand for?
    a. Crop
    b. Cut
    c. Corporate
    d. Create

19. What does the "U" in the "UDA" acronym stand for?
    a. Usher
    b. User
    c. Unite
    d. Union

20. User Access is never a safeguard concern with UDA spreadsheets.
    a. True
    b. False

Market Briefing - Year-End 2023 • Market Recap and Potential Impact on U.S. Insurance Company Investments

Multiple Choice and True or False Questions — Submit Answers Online

21. What bond grade would be most at risk of a downgrade in an economic downturn?
    a. BBB+
    b. BBB-
    c. BBB
    d. BB

22. In the last 40 years, the Treasury yield curve has been inverted:
    a. More than 10 times
    b. Less than 20 times
    c. Less than 10 times
    d. Never

23. The fair market value of fixed income investments was positively impacted by rising interest rates.
    a. True
    b. False

24. Residential Mortgage-Backed Securities (RMBS) are susceptible to significant changes in cash flows based on prepayments of the underlying mortgage loans:
    a. True
    b. False

25. What category in commercial real estate values was the worst performer?
    a. Retail
    b. Apartment
    c. Office
    d. All the above

Integrating Artificial Intelligence in Risk Management: Navigating Challenges and Exploring Rusk Transfer Strategies

By Dr. Marcus Schmalbach
RYSKEX Inc.

Introduction

In today's rapidly evolving digital world, the integration of Artificial Intelligence (AI) in risk management represents a pivotal shift, redefining traditional approaches and introducing a new paradigm in managing uncertainties. AI, with its unparalleled data processing capabilities and predictive analytics, is not just an enhancement but a fundamental transformation in the field of risk management. This technology empowers organizations to navigate through complex and dynamic risk landscapes, enabling them to identify, assess, and respond to potential threats with a level of precision and foresight previously unattainable. The utilization of AI extends beyond mere risk identification; it offers innovative solutions in risk mitigation and transfer, thereby revolutionizing the way risks are handled in various sectors.

The significance of AI in risk management cannot be overstated. It brings about a more proactive and predictive approach to managing risks, shifting the focus from reaction to prevention. This transformative power of AI is particularly critical in an era where the nature and complexity of risks are constantly evolving, driven by factors such a. technological advancements, global interconnectedness, and socio-economic changes.

The aim of this article is to provide a thorough exploration of the role of AI in revolutionizing risk management and risk transfer. It seeks to examine the profound impact of AI technologies in enhancing risk assessment and decision-making processes, the challenges and limitations posed by these technologies, and the innovative ways in which risk transfer is being redefined in the age of AI. This exploration will not only shed light on the current state of AI in risk management but also project its future trajectory, offering valuable insights for both practitioners and researchers in this rapidly advancing field.

The Evolution from Traditional to AI-Enhanced Risk Management

Risk management has evolved significantly, transitioning from traditional methods to a more sophisticated AI-enhanced approach. Historically, the field of risk management was characterized by manual data analysis and reliance on human intuition. This approach, while practical for simpler times, often led to delayed responses and decisions influenced by subjective biases. It lacked the capability to efficiently process large volumes of data or predict future trends with high accuracy.

Image 1: ***Not the NASA control center - the Risk Management Department of a company***

With the advent of AI technologies, a paradigm shift occurred in how risks are identified, assessed, and mitigated. AI's ability to handle vast datasets and uncover patterns invisible to the human eye has been transformative. A prime example is JPMorgan Chase's deployment of the AI program COiN (Contract Intelligence). COiN can analyze complex legal documents in mere seconds, a task that would traditionally consume 360,000 hours of work annually by human lawyers. This innovation not only expedited processes but also significantly reduced the risk of human error, leading to more accurate and efficient risk management.

In the healthcare sector, the impact of AI is equally profound. AI algorithms are now capable of predicting patient risks by analyzing electronic health records with incredible precision. Google's DeepMind Health project, for example, can predict acute kidney injuries up to 48 hours before they occur. This predictive capability allows for early intervention, significantly improving patient outcomes and transforming healthcare risk management.

AI Technologies in Risk Management: The application of AI in risk management is diverse, with various technologies playing pivotal roles. Machine Learning (ML), a key subset of AI, stands out for its ability to learn from historical data and improve over time. In financial risk management, ML algorithms are used to detect and predict fraudulent activities, thus enabling institutions to take proactive steps to prevent financial crimes. These algorithms can identify subtle patterns and anomalies in transaction data that would be impossible for human analysts to discern.

Natural Language Processing (NLP) represents another vital AI technology in risk management. NLP tools can analyze unstructured data sources, like social media posts or news articles, to gauge public sentiment or identify emerging risks. Hedge funds, for instance, leverage NLP to analyze vast amounts of news and social media content, helping them predict stock market movements and manage investment risks more effectively. This ability to process and analyze large-scale unstructured data in real-time is revolutionizing how risks are anticipated and managed.

Challenges and Limitations of AI in Risk Management: Despite the significant advances brought by AI in risk management, the technology is not without its challenges and limitations. A major concern is the potential for bias in AI models, particularly when these models rely on historical data that may be unrepresentative or incomplete. If an AI system is trained on past financial data that lacks diversity, for example, it may fail to accurately predict risks for underrepresented groups, leading to skewed and unfair outcomes.

Ethical considerations are also paramount, especially regarding privacy and data security. AI's capability to monitor and predict individual behaviors, such as in insurance underwriting or personalized marketing, raises serious questions about privacy rights and the potential for misuse of personal data. This has spurred a growing debate on the ethical implications of AI in risk management, calling for stringent regulations and ethical guidelines to govern the use of AI in sensitive areas.

Another significant challenge is the ‚black box' nature of some AI systems, where the decision-making process is not transparent or easily understandable. This opacity can undermine trust in AI systems, particularly in critical fields like healthcare, where AI recommendations without clear explanations have led to skepticism and reluctance among medical professionals. Addressing this lack of transparency is crucial for the wider acceptance and ethical use of AI in risk management.

In conclusion, while AI technologies have significantly advanced risk management practices by providing more accurate, efficient, and sophisticated tools, it is imperative to navigate these challenges and limitations thoughtfully. By addressing ethical concerns, ensuring transparency, and actively working to mitigate biases, the full potential of AI in risk management can be harnessed in a responsible and beneficial manner for all stakeholders.

Risk Transfer in the Age of AI

The advent of AI has significantly influenced the concept of risk transfer, particularly in the insurance industry. Risk transfer, the process of legally or financially shifting the potential loss from one party to another, traditionally relied on standard insurance models and straightforward financial instruments. However, the integration of AI technologies has brought about innovative changes in how risks are assessed, priced, and transferred.

In the insurance sector, AI has enabled more accurate risk assessment, leading to personalized insurance policies. Insurers are now using AI to analyze vast arrays of data, including personal health records, driving behaviors, and even social media activity, to tailor insurance policies to individual risk profiles. This granular level of risk assessment allows for more accurate pricing of premiums, potentially lowering costs for low-risk individuals while providing insurers with a more precise understanding of their risk exposure.

AI's impact on risk transfer is also evident in the development of parametric insurance solutions. Unlike traditional insurance that compensates for actual losses incurred, parametric insurance provides payouts based on the occurrence of specific parameters or metrics, such as the magnitude of an earthquake or the speed of a windstorm. AI plays a crucial role in parametric insurance by accurately monitoring and verifying these parameters, thus ensuring swift and objective payout processes.

Case Studies: AI-Driven Risk Transfer Solutions

Parametric Insurance for Natural Disasters: One notable example of AI-driven risk transfer is the use of parametric insurance for natural disasters. Swiss Re, a leading reinsurance company, has implemented AI algorithms to assess and respond to natural disaster claims. For instance, in the aftermath of a hurricane, the AI system analyzes satellite imagery, wind speed data, and other relevant parameters to quickly determine the payouts, bypassing the lengthy traditional claims process.

Crop Insurance and AI: Another groundbreaking application is in the agricultural sector. Companies like The Climate Corporation use AI to offer parametric crop insurance. Their AI models analyze weather data, soil conditions, and crop types to determine the risk of crop failure. Farmers receive automatic payouts when specific conditions, such as drought or excessive rainfall, are met, providing timely financial support without the need for traditional claims assessment.

AI in Health Insurance: Oscar Health, an AI-driven health insurance provider, uses AI to personalize health insurance plans. By analyzing individual health data and lifestyle choices, Oscar offers customized insurance policies and proactive health recommendations, transforming how health risks are assessed and managed.

Automotive Industry and AI-based Insurance: In the automotive industry, companies like Tesla are pioneering AI-based insurance models. By leveraging data from their vehicles' advanced sensors and AI systems, Tesla can offer personalized insurance plans based on actual driving behaviors, leading to more accurate risk assessment and potentially lower premiums for safer drivers.

Image 2: ***How AI and self-driving cars are changing cities***

These case studies exemplify the transformative role AI plays in risk transfer. By leveraging advanced data analytics and predictive models, AI is enabling more efficient, fair, and responsive risk transfer mechanisms, reshaping industries and providing innovative solutions to age-old problems.

Future Trends and Predictions in AI and Risk Management

As we look towards the future, the intersection of AI and risk management is poised for even more groundbreaking developments. The rapid advancement of AI technologies, coupled with increasing data availability, will continue to transform risk management in unprecedented ways.

Enhanced Predictive Analytics: Future advancements in AI will likely bring about even more sophisticated predictive analytics. This will involve not just the analysis of existing data, but also the ability to forecast future events with greater accuracy. For instance, AI systems could predict market crashes or economic downturns by analyzing subtle patterns in global financial data, enabling preemptive risk mitigation strategies.

Integration with IoT and Big Data: The integration of AI with the Internet of Things (IoT) and big data will provide a more interconnected and comprehensive risk management framework. IoT devices will continually collect real-time data, feeding AI systems with a constant stream of information to analyze. This could lead to dynamic risk management models that adjust in real-time to changing conditions, such as environmental sensors triggering immediate responses to natural disasters.

Autonomous Risk Management Systems: We may see the emergence of fully autonomous risk management systems. These systems would operate with minimal human intervention, continuously monitoring, analyzing, and responding to potential risks. This could be particularly transformative in sectors like cybersecurity, where AI systems could independently identify and neutralize threats.

Ethical AI and Regulation Development: As AI becomes more embedded in risk management, the development of ethical guidelines and regulatory frameworks will become increasingly important. This will involve creating standards for data usage, ensuring transparency in AI decision-making processes, and establishing protocols for addressing AI biases. The development of international AI risk management standards is likely, aiming to harmonize practices across different countries and industries.

Collaborative AI and Human Expertise: Despite the advancements in AI, the future will likely emphasize the synergy between AI and human expertise. AI systems will augment human decision-making, providing comprehensive data analysis while leveraging human insights for nuanced understanding and ethical considerations. This collaborative approach will maximize the strengths of both AI and human judgment.

AI in Climate Change and Environmental Risk Management: Another significant area of future development will be the use of AI in managing risks related to climate change and environmental sustainability. AI could play a critical role in monitoring environmental changes, predicting climate-related risks, and aiding in the development of sustainable practices and disaster response strategies.

Parametric Solutions in New Domains: The concept of parametric solutions, already transforming areas like natural disaster insurance and crop protection, is likely to expand into new domains. This could include areas like supply chain management, where AI-driven parametric solutions could automatically trigger responses to disruptions, or in health insurance, with payouts linked to specific health parameters monitored by AI systems.

Image 3: ***The Underwriting Room at Lloyd´s of London in the near future***

Conclusion and Outlook

As Artificial Intelligence continues to permeate the domain of risk management, the horizon is marked by promising advancements and challenges that necessitate vigilant navigation. The convergence of AI with risk mitigation and transfer strategies has begun to demonstrate profound capabilities, reshaping traditional methodologies and fostering a proactive, rather than reactive, stance towards potential threats.

The transformative journey of AI in risk management is still in its nascent stages, and the potential for growth is immense. With each technological breakthrough, AI is set to enhance our predictive prowess, refine risk transfer mechanisms, and create more resilient systems against the unforeseen. The insurance industry, once grounded in historical data and actuarial tables, is now on the cusp of a new era characterized by AI-driven insights and personalized risk solutions.

Looking forward, we anticipate AI to mature in its ability to not only analyze and interpret data but also to intuit and reason in a manner that mirrors the complexity of human judgment. This will demand a parallel evolution in ethical standards and regulatory frameworks, ensuring that AI's integration into risk management upholds the highest integrity and societal benefit.

Moreover, the synergy between AI and human expertise is expected to intensify. Human oversight will remain indispensable, particularly in interpreting AI's data-driven conclusions within the nuanced context of risk-related decision-making. As such, the future will not see AI replacing human roles but rather augmenting human capabilities to achieve more sophisticated, equitable, and efficient risk management practices.

In conclusion, AI stands as a beacon of innovation in the field of risk management, promising to illuminate paths previously shrouded by uncertainty. By embracing this technology with a balanced approach—honoring both its potential and its boundaries—we forge a future where risks are not merely managed but mastered with intelligence and insight.

This optimistic outlook is tempered by the responsibility that comes with wielding such powerful tools. As we venture forward, it is the collective duty of technologists, ethicists, industry leaders, and policymakers to steward AI's growth responsibly—to harness its full potential while safeguarding the principles of privacy, fairness, and transparency. In doing so, we ensure that the future of risk management is not only intelligent but also wise, not only powerful but also principled, paving the way for a safer, more predictable world.

About the Author

Dr. Marcus Schmalbach is Founder and CEO of RYSKEX Inc., based in New York City. He has a long-standing experience in risk and captive management in various industries. Before the founding of RYSKEX he was Head of German MBA program. He is still working as a visiting professor on Risk and Finance matters, and academic head of BlockART Institute with a research focus on Parametric Risk Transfer. He is Professor at ESCP Business School, Paris, France with a research and lecturing focus on Blockchain Technology and Artificial Intelligence.

Establishing a Framework for Practical Data Governance and Examiner Considerations

By John Romano, CPA, CIA, CFE, CITP, CSM and Russell Sommers, CPA, CISA Baker Tilly LLP

Recently, the buzzwords in the insurance industry have been machine learning (ML) artificial intelligence (AI) and data driven, algorithmic decision making. The foundation for each of these technologies is data and the framework providing guidance over the ingest, analysis, use, storage and reporting of this data is collectively referred to as data governance. Data governance tends to be thought of as an information technology (IT) responsibility, when in reality, it's a topic that impacts all areas of a company. Many insurers have already found success by harnessing and using data, enabling leaders to make data-driven business decisions to better serve policy holders and execute strategy. As insurance organizations continue to increasingly use data, there is a heightened regulatory focus on the handling of sensitive information.

Up until recently, many have focused on implementing a cybersecurity program designed to identify and protect non-public information and maintain the integrity of information systems, as well as the ability to detect, respond to and recover from cybersecurity events in a timely manner. From there, they would respond to and recover from those events. A new area of focus is the governance and use of business data, with a specific emphasis on the types of data being collected and used, the purpose behind the collection of that data, how access to that data is controlled and the controls in place to ensure that the use of data doesn't introduce bias into decision making and/or create disparate impact to groups of users.

Why is data governance so important within the insurance industry?

In 2022, nearly 422 million individuals were impacted by U.S.-based data compromises/breaches. Despite this, the use of data globally is increasing rapidly. By 2025, global data is predicted to increase to 175 zettabytes – up from only 33 zettabytes in 2018. Many insurers have access to more data than they can effectively utilize, and they seek insights to learn more about the different actions they should take to better handle and analyze that data to add value to their organization.

In the insurance industry, data governance is an important component of ensuring the consistent treatment of data to uphold compliance responsibilities and support strategy execution. It is the process of managing the availability, usability, integrity and security of an organization's data. Developing a strong data governance framework involves defining policies, procedures and standards for proper data management while also assigning roles and responsibilities across your team to ensure that data is properly managed throughout its lifecycle, as well as, the tooling and metrics to assess efficacy.

Key components of data governance frameworks

Two important components of establishing a data governance framework are data literacy and data ownership. By focusing on data literacy, organizations will be able to identify opportunities to enable better information access, stewardship and security. Everything that helps organization engage better with data to better understand it from a knowledge perspective, as well as finding the data from a resource perspective, is a part of data literacy. This will enable you to drive data decisions on a consistent basis and it is a key part of a data governance framework. It is also important to ensure that the individuals working within your organization understand the data they are using and how to properly analyze it. From a change management perspective, any new policies or procedures you attempt to implement will not be effective without a proficient level of data literacy.

It is also important to establish a framework for data ownership to align business stakeholders with information technology, therefore providing guidance and resources for key data assets. This side of the data management spectrum focuses on accountability and visibility into who 'owns' certain data assets within your organization. Specific individuals and teams need to police how data is used, managed, viewed and analyzed to ensure accountability and to be considerate of the proper handling of sensitive information. Similar to data literacy, for data ownership, it is essential that everyone within your organization knows who is responsible for certain data assets and who they can reach out to when necessary.

Data governance covers a broad spectrum, including everything from policies, standards and strategy to management and support, data quality control and privacy, compliance and security. It is crucial that insurance organizations implement sounds data governance practices in order to scale for increased data volume, improve self-service reporting and data analytics and stay on in front of regulatory and compliance requirements.

Data governance framework

As the use of data becomes more necessary to execute strategy, the opportunities to harness your organization's data to further grow your business will grow exponentially. Technologies like ML and AI are playing bigger roles in how we use data, and they represent significant opportunities and areas for growth for insurance companies. A strong data governance framework needs to be established before your organization starts to delve into these new technologies.

It is essential to have a data governance framework that is cohesive with overall data strategy. Having one standard policy in place across the entire organization concerning the handling of data is the best way to ensure accountability, consistency and ownership over data. Ultimately, the ownership of data should be held within the hands of the respective business owners instead of the IT team so that it is properly represented by stakeholders who have detailed ownership and accountability over those assets.

Regulatory landscape and Examiner considerations

Insurance organizations are in various stages of establishing a robust data governance framework. Examiners, as part of an NAIC Financial Condition examination, should be able understand how the insurance organization ensures they comply with all of the necessary regulations.

NAIC Insurance Data Security Model Law

In Oct. 2017, the National Association of Insurance Commissioners (NAIC) adopted the Insurance Data Security Model Law (Model #668) in response to several major data breaches involving large insurers that exposed and compromised the sensitive information of millions of insurance consumers. The model requires insurers and other entities licensed by a state department of insurance to develop, implement and maintain an information security program based on its risk assessment. There must be board oversight, policies and procedures, skilled personnel, asset management protocols, data protection tools, an incident response plan in place, vendor oversight, program adjustments where necessary and annual certifications to the superintendent.

NAIC AI principles

On Aug. 14, 2020, the NAIC adopted principles for artificial intelligence (AI) and its use. These principles require insurers to:

- Proactively avoid discrimination against protected classes
- Monitor AI operations and resolve harmful, unintended consequences
- Disclose use of AI and give consumers an opportunity to inquire/challenge AI decisions
- Embed risk management throughout the AI lifecycle

These principles are not laws and as such are not enforceable, but they set out the regulators' expectations and will form the basis for future regulatory workstreams. The NAIC created the Fair and Ethical, Accountable, Compliant, Transparent and Secure (FACTS) guidelines to establish consistent high-level guiding principles for insurance organizations that play an active role in the AI system lifecycle – otherwise known as AI actors.

- Fair and ethical: AI actors should respect the rule of law throughout the AI lifecycle. This will include, but is not limited to, laws and regulations with respect to insurance
- Accountable: AI actors should be accountable for ensuring that the proper functioning of AI systems operate in compliance with all stated principles, the risk-based situational context and evolving best practices
- Compliant: AI actors must have specific knowledge of all applicable federal and state insurance laws and regulations
- Transparent: AI actors should commit to transparency and responsible disclosures regarding AI systems to relevant stakeholders while maintaining the ability to protect confidentiality and adhere to individual state regulations in all states where AI is deployed.
- Secure, safe and robust: AI systems should be robust, secure and safe throughout the entire lifecycle so that in conditions of normal use the AI system can function accurately and appropriately.

NAIC Model bulletin

At the recent 2023 NAIC summer national meeting, the NAIC issued a bulletin concerning the use of AI systems and the corresponding regulations. The Bulletin encourages the development and use of innovation and AI systems that contribute to safe and stable insurance markets. However, the Bulletin indicated that a Department expects that insurers that use AI systems to support decisions that impact consumers will do so in a manner that complies with and is designed to assure that the decisions made using those systems meeting the requirements of all applicable federal and state laws.

The Bulletin recognizes the Principles of Artificial Intelligence that the NAIC adopted in 2020 as an appropriate source of guidance for insurers as they develop and use AI systems. Those principles emphasize the importance of fairness and ethical use of AI, accountability, compliance with state laws and regulations, transparency and a safe, secure, fair and robust system.

Guidance at subsequent meetings suggested that those using AI driven decisioning should be intentionally testing the results of those decisions to determine whether the AI decisioning has resulted in disparate impact to any protected groups.

Outcomes of governance

Aspects of a strong data governance program include well-defined roles and responsibilities, ownership by one team to ensure accountability, protection of sensitive information and the continuous monitoring of data quality. Before insurance organizations dive into developing a data governance framework, it is important to have the right structure in place. While insurance organizations may have some immediate goals regarding data quality or even self-service reporting, it is important they the long-term in mind and have a perspective on the target state for data usage and governance. A data governance program is not a one-time initiative that you implement and then move on. Insurance organizations will need to consistently build upon it as time goes by.

Considerations for Examiners and IT Examiners on an NAIC Financial Condition Examination:

- Assessment of Compliance with Data Security Model Law: Verify that insurance organizations are adhering to the NAIC Insurance Data Security Model Law (Model #668), ensuring they have developed, implemented, and maintained an effective information security program.

- Evaluation of AI Principles Application: Evaluate how insurance organizations are incorporating the NAIC AI principles, focusing on non-discrimination, operational monitoring, consumer disclosure, risk management, and adherence to FACTS guidelines.

- Review of Data Governance Framework: Review the insurer's data governance framework, ensuring it encompasses policies, standards, management, support, data quality control, privacy, compliance, and security.

- Inspection of Data Analytics and AI Usage: The use of data analytics and AI technologies should be inspected to ensure they align with the organization's data governance framework and comply with regulatory expectations. This inspection should include specific testing to determine whether any AI driven decisioning has resulted in disparate impact to protected groups.

- Verification of Data Ownership and Literacy: It is crucial to verify that data ownership and literacy are clearly defined and understood within the organization, ensuring proper data management and accountability.

In summary, we should be conducting a comprehensive examination of an insurer's data governance practices, focusing on compliance, security, and effective use of technology, ensuring the organization is aligning with regulatory standards and best practices.

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John Romano serves as a partner in Baker Tilly's financial services risk advisory practice, with more than 20 years of experience serving the financial services industry. He leads the insurance regulatory practice and internal audit risk advisory services for insurance organizations and provides services to financial institutions including banks and credit unions. In his role, he and his team help financial services clients and state regulators successfully address a variety of ongoing challenges and requirements. John and his team collaborate with clients to assess and improve enterprise risk management, governance, risk and controls through the integration of agile principles and methods. His expertise spans life insurance, property and casualty insurance, health insurance, and reinsurance, including expertise with third-party administrators, and managing general agents, and credit unions.

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Navigating Political Turbulence: Utilizing Captive Insurance for Business Resilience in the 2024 Presidential Campaign

By Leane Rafalko, CFE, ACI
CIC Services

The fervor and anticipation surrounding a presidential campaign are unparalleled, as citizens and businesses brace themselves for potential shifts in policies and regulations. While the political spectacle primarily focuses on the candidates and their promises, one often overlooked aspect is the impact it can have on businesses. The uncertainty and potential disruptions can prove to be challenging for businesses of all sizes. In fact, CEOs say political disruptions, like the 2024 presidential election, are the biggest risks this year (Fortune). One risk management strategy that can offer a lifeline during these trying times is captive insurance. In this comprehensive exploration, we will delve deeper into the risks associated with presidential campaign years and how captive insurance can provide substantial benefits to weather the storm.

Presidential Campaigns: A Time of Uncertainty

Presidential campaigns create an atmosphere of uncertainty for businesses due to the potential policy changes and regulatory shifts that can affect various industries. Candidates often propose changes in taxation, healthcare, trade agreements and other critical areas, causing businesses to grapple with potential impacts on their operations, financials and competitiveness.

Policy Uncertainty: Campaign rhetoric may differ significantly from the actual policies that get implemented. The lack of clarity can leave businesses in a state of limbo, unsure about making long-term decisions.

Market Volatility: The uncertainty during a presidential campaign can lead to market fluctuations and investor hesitancy, causing ripple effects throughout the business landscape.

Regulatory Changes: New administrations often bring changes to regulations, creating additional compliance burdens for businesses and sometimes even altering the competitive landscape.

Economic Impact: Presidential campaigns can generate economic turbulence, potentially affecting consumer spending and business investments.

Captive Insurance: A Strategic Risk Management Tool

Captive insurance provides an effective solution for businesses to manage risks associated with the uncertainties of a presidential campaign. Captive insurance is a self-insurance mechanism where businesses create their own insurance company to cover specific risks. Here's how captive insurance can be a valuable benefit during a presidential campaign:

Tailored Coverage: Captive insurance allows businesses to customize their insurance coverage to address their unique risks. By tailoring policies to specific needs, businesses can avoid being over-insured or under-insured during uncertain times.

Stability and Control: Traditional insurance markets often respond to political uncertainties with increased premiums or restricted coverage options. With captive insurance, businesses gain more control over their coverage, ensuring stability even during turbulent times.

Long-Term Risk Management: Captive insurance is a long-term risk management tool that goes beyond the political cycle. Businesses can establish consistent risk management strategies, unaffected by changing political climates.

Profit Potential: If the captive insurance company experiences fewer claims than expected, businesses can retain underwriting profits, creating an additional source of income.

Tax Benefits: Captive insurance arrangements can provide tax advantages, which can be particularly advantageous for businesses navigating potential changes in tax policies during a presidential campaign.

Enhanced Claims Handling: Captive insurance allows for a more direct and responsive claims handling process, reducing bureaucracy and accelerating the resolution of claims.

A presidential campaign can indeed prove to be a trying time for businesses due to uncertainty, market volatility and potential policy changes. To counter these challenges and strengthen their risk management strategies, businesses can turn to captive insurance. By providing tailored coverage, stability and long-term risk management, captive insurance offers a lifeline for businesses amidst political turbulence. Moreover, the potential for profit, tax benefits, and enhanced claims handling make captive insurance a powerful tool to ensure businesses not only survive but thrive in the face of political uncertainties. As the political landscape continues to evolve, businesses that embrace captive insurance will position themselves with a greater sense of stability and confidence, regardless of the political outcomes.

Mitigating Policy Uncertainty Through Captive Insurance

The heart of any presidential campaign lies in the promises made by candidates. However, the translation of these promises into actionable policies can be a source of uncertainty for businesses. Campaign rhetoric often serves as a blueprint for potential policy changes, but the actual implementation may deviate, leading to confusion and indecision among businesses.

Captive insurance emerges as a strategic tool to mitigate the risks associated with policy uncertainty. Traditional insurance policies may not provide the flexibility required during times of rapid policy changes. With captive insurance, businesses can tailor their coverage to align with the anticipated policy shifts, ensuring that they are adequately protected regardless of the political outcomes.

Customization in the Face of Regulatory Changes: Regulatory changes are a common occurrence with the advent of a new administration. These changes can range from alterations in industry-specific regulations to broader shifts in compliance requirements. Captive insurance allows businesses to proactively address these changes by customizing their policies to incorporate new regulatory landscapes. This agility ensures that businesses remain compliant and resilient in the face of evolving regulations.

Adapting to Market Volatility: Market volatility is a natural consequence of political uncertainty. Investors may adopt a wait-and-see approach, leading to fluctuations in financial markets. Such volatility can have cascading effects on businesses, impacting their valuation, access to capital, and overall stability. Captive insurance provides a shield against market turbulence by offering stability in coverage and financial protection tailored to the specific risks associated with market fluctuations.

Building Resilience in Economic Turbulence: The economic impact of a presidential campaign extends beyond policy changes and market fluctuations. Businesses may experience shifts in consumer spending patterns, and the overall economic landscape can influence investment decisions. Captive insurance serves as a long-term risk management strategy, allowing businesses to weather economic turbulence by providing consistent coverage and financial stability. This resilience enables businesses to navigate through challenging economic conditions and emerge stronger on the other side.

Harnessing Stability and Control with Captive Insurance

In the realm of risk management, stability and control are paramount. Traditional insurance markets may respond to political uncertainties with increased premiums, coverage limitations or even withdrawal from certain sectors. Captive insurance empowers businesses by providing a level of stability and control that is crucial during a presidential campaign.

Guarding Against Premium Fluctuations: Traditional insurers may adjust premiums based on perceived risks associated with political changes. This can lead to unpredictable and potentially burdensome increases in insurance costs. Captive insurance offers a shield against such fluctuations by allowing businesses to set their own premiums based on a thorough understanding of their unique risks. This predictability enables businesses to budget effectively and maintain financial stability during uncertain times.

Tailoring Coverage for Enhanced Protection: One size does not fit all when it comes to insurance coverage. The unique risks faced by businesses during a presidential campaign require tailored solutions. Captive insurance allows businesses to customize their coverage, ensuring that they are adequately protected against specific risks associated with policy changes, market volatility and economic turbulence. This level of customization goes beyond what traditional insurance markets can offer, providing businesses with a strategic advantage in managing uncertainties.

Long-Term Risk Management Beyond Political Cycles: The impact of a presidential campaign extends beyond the election period. Policy changes and regulatory shifts may continue to unfold even after the election results are announced. Captive insurance serves as a long-term risk management tool, offering stability and consistency in coverage irrespective of the changing political landscape. This long-term perspective allows businesses to develop resilient risk management strategies that withstand the test of time, providing a sense of security and confidence in the face of ongoing uncertainties.

Unlocking Profit Potential through Captive Insurance

While the primary purpose of insurance is risk mitigation, captive insurance presents an additional opportunity for businesses to unlock profit potential. The traditional insurance model involves paying premiums to an external insurer, and any underwriting profits generated are retained by the insurer. In contrast, captive insurance allows businesses to retain underwriting profits, creating a potential revenue stream.

Retaining Underwriting Profits: In a captive insurance arrangement, businesses essentially become their own insurers. This means that if the captive insurance company experiences fewer claims than expected, the underwriting profits are retained by the business. This unique feature provides businesses with a financial incentive to actively manage and mitigate risks, as the resulting underwriting profits contribute to the overall profitability of the captive insurance program.

Creating an Additional Source of Income: The ability to retain underwriting profits not only enhances the financial resilience of businesses but also creates an additional source of income. This income stream can be particularly valuable during times of economic uncertainty or when businesses are navigating potential challenges arising from policy changes. The profit potential inherent in captive insurance adds a layer of financial flexibility that traditional insurance models may not offer.

Navigating Tax Benefits in the Political Landscape

As presidential campaigns unfold, discussions around tax policies take center stage. The potential for changes in tax regulations creates additional complexities for businesses. Captive insurance, however, provides a strategic avenue to navigate the tax landscape effectively.

Tax Advantages of Captive Insurance Arrangements: Captive insurance arrangements can offer tax advantages for businesses. These advantages can be particularly valuable during a presidential campaign year, where potential changes in tax policies may impact businesses' bottom lines. The ability to structure insurance programs in a tax-efficient manner allows businesses to optimize their tax positions while ensuring comprehensive risk coverage.

Aligning Captive Strategies with Tax Planning: The flexibility inherent in captive insurance extends to its alignment with tax planning strategies. Businesses can structure their captive insurance programs in a way that maximizes tax benefits, taking into account potential changes in tax policies. This strategic alignment ensures that businesses not only manage risks effectively but also leverage captive insurance as a tax-efficient tool in their overall financial planning.

Streamlining Claims Handling with Captive Insurance

In times of political turbulence, the ability to respond swiftly to emerging risks is crucial. Traditional insurance models may involve complex claims handling processes, leading to delays and bureaucratic hurdles. Captive insurance, on the other hand, streamlines claims handling, offering a more direct and responsive approach.

Direct and Responsive Claims Handling: Captive insurance allows businesses to directly manage and handle claims without the layers of bureaucracy often associated with traditional insurers. This direct approach ensures that claims are addressed promptly, minimizing disruptions to business operations and accelerating the resolution of issues. The streamlined claims handling process enhances the overall efficiency of risk management, a critical factor during presidential campaign years when uncertainties may require swift and decisive action.

Reducing Administrative Burden: Traditional insurance models often involve administrative complexities, with businesses relying on external insurers for claims processing. Captive insurance reduces this administrative burden by empowering businesses to handle claims internally. This reduction in administrative complexity not only speeds up the claims handling process but also allows businesses to maintain greater control over the resolution of issues, fostering a more proactive and agile approach to risk management.

Embracing Captive Insurance for Future Stability

As the 2024 presidential campaign unfolds, businesses face a landscape of uncertainties, policy changes, and potential disruptions. Navigating these challenges requires a strategic and resilient risk management approach, and captive insurance emerges as a powerful tool for businesses seeking stability and control.

Strategic Positioning for Stability: Captive insurance positions businesses strategically for stability in the face of political uncertainties. The ability to tailor coverage, maintain control over premiums, and navigate tax landscapes ensures that businesses are well-equipped to withstand the impacts of a presidential campaign. This strategic positioning allows businesses to focus on their core operations with confidence, knowing that their risk management strategies are aligned with their unique needs and the evolving political landscape.

Building Confidence Amidst Uncertainties: Confidence is a valuable asset for businesses navigating the uncertainties of a presidential campaign. Captive insurance not only provides tangible benefits in terms of risk mitigation and financial stability but also fosters a sense of confidence among business leaders. The knowledge that they have a customized risk management strategy in place, coupled with the potential for profit retention and tax advantages, instills a level of assurance that is invaluable during times of political turbulence.

Adapting to Evolving Political Landscapes: The political landscape is dynamic, and businesses must adapt to evolving scenarios. Captive insurance offers businesses the flexibility to adapt their risk management strategies in response to changing political climates. Whether facing new regulatory challenges, market shifts, or economic uncertainties, businesses with captive insurance programs can navigate these changes with agility and resilience.

Conclusion: A Blueprint for Business Resilience

In conclusion, the 2024 presidential campaign introduces a myriad of challenges and uncertainties for businesses. The risks associated with policy changes, market volatility, regulatory shifts, and economic turbulence necessitate a proactive and strategic risk management approach. Captive insurance emerges as a blueprint for business resilience, offering tailored coverage, stability, long-term risk management, profit potential, tax benefits and streamlined claims handling.

As businesses look towards the future, embracing captive insurance provides a pathway to not only survive but thrive amidst political uncertainties. The strategic alignment of risk management with the unique challenges posed by a presidential campaign positions businesses for stability, confidence, and continued success. In the ever-evolving landscape of politics and business, captive insurance stands as a beacon of resilience, empowering businesses to navigate the complexities of the 2024 presidential campaign and beyond.

About the Author

Leane A. Rafalko, CFE, ACI, serves as the director of captive management at CIC Services, LLC. Rafalko's extensive regulatory and private sector experiences bring a lot to the table and further CIC Services' work for its clients.

Previously, Rafalko was an audit manager at RH CPAs, PLLC, and oversaw financial statement audits of a broad spectrum of insurance entities with multi-jurisdictional requirements, multiple lines of insurance business and reinsurance considerations. Prior to joining RH CPA's PLLC, Leane was a senior captive consultant at Hylant Global Captive Solutions where she worked with clients in consulting, developing, and managing captive insurance structures.

On the regulatory side, Rafalko spent over 20 years with the North Carolina Department of Insurance. where she reached the position of chief captive analyst and assisted the senior deputy commissioner in licensing and regulating North Carolina domestic captive insurance companies.

Additionally, while in the NC DOI, Rafalko held the position of insurance company examination manager for the financial evaluations division where she led statutory financial examinations of the financial records of insurance companies licensed and domiciled in the state of North Carolina.

Rafalko earned a Bachelor of Science in accounting from the University of Scranton. She obtained the Certified Financial Examiner (CFE) professional designation and the Associate in Captive Insurance (ACI) professional designation. She has also been a member of the Society of Financial Examiners, (SOFE) since 2007 and was appointed to the SOFE Board of Governors in 2011 and served two terms, ending in 2021, and was appointed again in 2023. Rafalko has also recently been elected to the Board of Directors for the North Carolina Captive Insurance Association and began her term in May 2023.

The Shadow Knows, but Does Not Care … about IT Controls

By Philip E. McMurray, CISSP, CISA, AES, CBSP
Risk & Regulatory Consulting, LLC

Starting in the 1930s, the radio waves crackled with stories of a detective named "The Shadow". The radio program's tagline included the famous phase "…the Shadow Knows", and the start and end of each program included this phrase as it became part of the nation's depression-era lexicon.

Flipping the calendar pages to present day, a shadow is cast across insurers throughout the country, representing a potential threat to companies and policyholders alike. This threat is none other than "Shadow IT". Because our lives often revolve around the Internet, a quick check for the definition of Shadow IT was found on Wikipedia, "Shadow IT is a term often used to describe information-technology systems and solutions built and used inside organizations without explicit organizational approval. It is also used, along with the term "Stealth IT", to describe solutions specified and deployed by departments other than the IT department. Shadow IT is considered by many an important source for innovation and such systems may turn out to be prototypes for future approved IT solutions. On the other hand, shadow IT solutions are not often in line with the organization's requirements for control, documentation, security, reliability, etc., although these issues can apply equally to authorized IT solutions."

Because Shadow IT is defined in Wikipedia, it must be a thing. Like many things, it has good and bad aspects. In the world of IT reviews, we don't generally go out and identify the good aspects of IT controls, except to the extent that we look past them to find the bad aspects. It's a bit nihilistic, but it's also a fact of life in the world of auditing. Anyway, as stated above, Shadow IT can be an important source of innovation, but the flip side of the coin are potential costs in terms of data confidentiality, integrity and availability. Because data is the most valuable asset of any company, Shadow IT can definitely move the needle regarding risk.

The most common type of threat posed by Shadow IT has traditionally resulted from the use of spreadsheets and other distributed technologies. These programs generally fall into the category of User Developed Applications, or "UDAs", and the uncontrolled use of these programs can significantly increase an insurer's data risk profile. The big problem with spreadsheets is their ubiquity, as nearly everyone uses them for a wide range of tasks. As the "killer application" that drove the original PC revolution back in the early 1980s, spreadsheets are now used for everything from managing the March Madness basketball pool to calculating adjustments to a company's general ledger.

While UDAs serve to empower multiple generations of PC users via macros, vbscript and other spreadsheet features, a new and potentially more dangerous player has now taken the stage. This new and ominous threat is called "lowcode/nocode" development (SharePoint is a common example), and it provides a vastly-simplified method for creating sophisticated applications. If an insurer doesn't have good controls over data access and permits this type of application development, the needle on the risk meter quickly starts pointing all the way into the red. With these new tools, an empowered but unwary business leader could potentially create their own applications, load them onto a remote server owned by a third-party, link sensitive corporate production data to that application, and fly under an insurer's controls radar. Anybody see a problem with that?

For starters, compliance will likely be a problem. Since the IT department may not know about such rogue applications, the compliance team stands little chance of being in the loop. The flow of data to support the rogue application has the potential to compromise an insurer's ability to comply with a host of regulations, including SOX, MAR, HIPAA, PCI, GDPR, and the list goes on and on.

Other possible issues with Shadow IT include application inconsistency, operational inefficiency, and an inability to trust the data that an insurer relies on to make decisions. Modern databases rely on a model called "CRUD" (this is really a model and I am not making this up). CRUD is an acronym that stands for Create, Retrieve, Update, and Delete, which make up the four basic functions of persistent data storage. Shadow IT applications can frequently (R) retrieve data from a production database, but it's often much more difficult to (U) update the original database, potentially leading to a separate data store that lives in a silo and doesn't match what's in the company's official system of record. As a result, the integrity of data can become a casualty of Shadow IT efforts. Where things get really interesting is when rogue application data is fed into spreadsheets (because, why not?), and those spreadsheets support business decisions. Not surprisingly, we often run into this exact scenario during IT reviews.

On top of the data integrity risks and a potential for bad decisions is a little thing called end user access, which is one of the key elements of any security program. Rogue applications running on "wherever servers" may not follow established access and authentication policies. While this sounds cynical, it's based on seeing this scenario play out at insurers of all sizes and service lines. With inadequate access and authentication controls, all bets are off regarding data protection. Think about the risk posed by an unknown shadow application running on a rogue server at a health insurer that has access to all of the insurer's data, including claim details and personal subscriber information. Now, think about the risk level if there isn't a way to prevent some anonymous employee from getting to all of that data.

Fortunately, there is hope, although there is also a famous quote, "…hope is not a strategy", leaving insurers to develop and implement a solution for addressing Shadow IT risks. Fortunately, such a solution likely already exists within most companies we examine in the form of IT controls. These controls have been developed over the course of many years, and got a real boost via regulatory requirements like SOX and MAR. The key challenge is to marry those controls with the Shadow IT world, allowing an insurer to take the proper precautions to protect their data assets and their reputations. It's not an easy or simple effort, and it generally takes a top-to-bottom effort to implement an effective program. Ultimately, such a program should aim to reduce data risk to an acceptable level, while also enabling the use of innovative tools and technologies that led to the use of Shadow IT.

So the controls that need to be implemented to resolve the Shadow IT menace are the same controls that already support the mainstream IT environment. Those mainstream IT controls likely didn't exist prior to the SOX and MAR requirements, so there is a history of addressing these types of risks. The necessary controls need to address most levels of IT risk governance and operations, with obvious examples being access control, change management, and data resilience. The primary roadblocks to getting this done are the familiar ones, such as lack of resources, lack of enterprise commitment, and the need to focus on competing priorities.

As is generally the case, resolving the Shadow IT issue will compete with many other priorities until someone at the top of a Company decides to fix it. We have seen that this executive-level support is crucial, based on multiple exam cycles at certain insurers. This is a clear example of how the IT review can contribute to the value provided by a regulatory examination.

About the Author

Philip E. McMurray, CISSP, CISA, AES, CBCP, is an IT Specialist Director with Risk & Regulatory Consulting, LLC. Since joining RRC, Phil has performed IT consulting in connection with risk-focused examinations on behalf of state insurance departments as well as internal audit services for financial services companies. He has spent much of his 40-year career focused on information risk management, consulting, and delivering internal audit and advisory services. Phil is well versed in systems analysis and development, technology operations, documentation reviews and management interviews in order to assess IT controls and to provide recommendations to company management. Phil holds a Bachelor of Arts in English from Eastern Connecticut State University, and an MBA from Golden Gate University. His certifications include Automated Examination Specialist (AES), Certified Information Systems Auditor (CISA), Certified Information Systems Security Professional (CISSP), and Certified Business Continuity Professional (CBCP).

Market Briefing - Year-End 2023 • Market Recap and Potential Impact on U.S. Insurance Company Investments

By Edward Toy | Risk & Regulatory Consulting, LLC

Introduction

Coming into 2023, the Federal Reserve Board (the "Fed") had been aggressively increasing interest rates with a goal of taming a sharp spike in inflation. Expectations were high that this would lead to an economic recession either in 2023 or early 2024. Equity markets had dropped dramatically in 2022, recognizing both higher interest rates and the prospects for weaker corporate earnings as well as significant increases in defaults. Market volatility was up with all these factors. This market volatility continued into and throughout 2023 as markets struggled to find a consistent direction. Sentiment moved back and forth between continued interest rate increases by the Fed to rein in inflation and expectations that the Fed would overshoot the target, resulting in a recession and then leading to a need for the Fed to rapidly lower interest rates. This turmoil was punctuated by other specific events and drivers. One was the turmoil that was driven by several bank failures. A second was the growing sentiment of companies and individuals to not return to their traditional office spaces. This Market Briefing reviews some of the key market metrics and discusses what were the likely impacts on U.S. insurance company investments and investment strategies. Additionally, this briefing will help U.S. insurance regulators prepare for and review market impacts to U.S. insurance company financial statements for 2023 as they become available in the next few months. *[The data for U.S. insurance company investments was all based on Financial Statement Data submitted to the NAIC and acquired via S&P Capital*

U.S. Insurer Invested Assets

	Insurance Industry		Life Insurers		P&C Insurers		Health Insurers	
	2021	2022	2021	2022	2021	2022	2021	2022
	(as a percent of Unaffiliated Long Term Assets)							
Total Bonds	75.01	75.50	79.42	78.69	63.98	66.75	82.21	84.75
Corporate (plus Loans)	43.05	43.63	51.34	51.20	25.04	26.62	33.97	35.16
Governments	13.92	13.65	9.52	9.01	23.08	23.69	22.05	21.74
Structured	17.49	17.70	18.13	18.01	15.23	15.91	23.95	26.33
Mortgages and Real Estate	10.70	11.42	15.14	16.01	1.71	1.87	0.23	0.30
Equities (Preferred and Common)	10.38	8.91	1.56	1.22	30.38	27.05	13.24	10.48
Schedule BA	3.91	4.17	3.88	4.08	3.93	4.34	4.32	4.47
	(as a percent of Surplus)							
Equities (Preferred and Common)			13.85	11.41	43.02	40.50	13.65	10.63
Schedule BA			34.57	38.03	5.56	6.49	4.46	4.54

Before diving into the specific market details, a quick review of U.S. insurance company investments is useful. Investment portfolios consist primarily of fixed income investments, with about 75% of unaffiliated long-term assets in bonds and more than 11% in mortgage loans. The fair market value of investments with fixed coupons was significantly impacted by higher interest rates in 2022. Investments with longer maturities, and likely longer duration, would have been impacted more. Investments in equities are also significant, though the exposure as a percent of assets is not that material for Life companies. The percentage of reported equity exposure decreased in 2022 which is not surprising given the 19.4% decline in the S&P 500 in that year. Less transparent in terms of their equity market risk are those investments reported on Schedule BA. These tend to lean heavily to equity-type risk, but also include some fixed income-like instruments. Investments in private equity funds which represent a sizeable percentage of those reported on Schedule BA face some of same pressures on valuations as publicly traded equities, though changes in valuations may be recognized differently.

	Insurance Industry		Life Insurers		P&C Insurers		Health Insurers	
	2021	2022	2021	2022	2021	2022	2021	2022
Bond Portfolio Maturity Score	12.49	12.64	14.38	14.44	8.02	8.43	7.73	8.08
1 or less	9.72%	9.05%	6.88%	6.49%	16.67%	14.80%	15.17%	17.13%
1 to 5	30.12%	30.78%	25.28%	25.94%	41.08%	42.17%	45.61%	42.59%
5 to 10	28.18%	27.08%	27.32%	26.35%	30.29%	28.91%	29.69%	28.10%
10 to 20	15.24%	16.24%	18.36%	19.23%	8.17%	9.52%	5.31%	6.90%
greater than 20	16.75%	16.85%	22.16%	21.99%	3.79%	4.60%	4.22%	5.29%
Greater than 10 year	31.99%	33.09%	40.51%	41.22%	11.96%	14.12%	9.53%	12.18%

A key consideration for bond portfolios is the duration, and therefore interest rate risk, of the holdings. Duration is not reported on the investment schedules, but expected maturity dates are. While different variables impact the actual duration of individual holdings, maturity can be a reasonable indicator of exposure to longer duration assets. The average maturity score for Life insurers has been increasing in recent years and was almost 14.5 years as of year-end 2022. Property & Casualty ("P&C") insurers and Health insurers maintained considerably shorter portfolios, but they also lengthened some in 2022.

	Insurance Industry		Life Insurers		P&C Insurers		Health Insurers	
	2021	2022	2021	2022	2021	2022	2021	2022
Bond Portfolio Credit Sore	1.46	1.44	1.52	1.50	1.32	1.30	1.38	1.34
NAIC 1	62.57%	63.27%	56.78%	57.41%	76.88%	77.52%	72.38%	74.25%
NAIC 2	31.64%	31.58%	37.34%	37.21%	17.76%	18.03%	20.63%	20.09%
NAIC 3	3.53%	3.13%	3.78%	3.46%	2.72%	2.21%	4.19%	3.31%
NAIC 4	1.70%	1.50%	1.52%	1.38%	2.08%	1.74%	2.49%	2.08%
NAIC 5	0.41%	0.45%	0.42%	0.48%	0.43%	0.39%	0.20%	0.17%
NAIC 6	0.14%	0.07%	0.15%	0.06%	0.12%	0.09%	0.11%	0.09%
Below Investment Grade	5.79%	5.15%	5.88%	5.38%	5.35%	4.44%	6.99%	5.65%

Based on the distribution of bond holdings across the broad categories of NAIC Designations, credit quality in the bond portfolios has remained relatively stable. Holdings of below investment grade bonds declined in 2022 while holdings of bonds in the triple-B category stayed relatively stable. Of potential interest, and perhaps deserving of special focus, would be those with a BBB-minus rating since those would be most at risk of downgrade in an economic downturn to below investment grade. For P&C and Health insurers, below investment grade bonds are held at the lower of cost or market. Life insurers can carry them at amortized cost as long as the bonds are not in default. In addition to changes in interest rates, another significant factor impacting the fair market value of bonds is the spread over risk free rates. The market based credit spread that can be expected varies depending on expectations of default.

(000's)	Insurance Industry		Life Insurers		P&C Insurers		Health Insurers	
New Data Collection beginning 2022	2021	2022	2021	2022	2021	2022	2021	2022
Collateral Loans								
Affiliated	9,656,948	11,844,349	8,372,771	10,925,699	679,771	489,395	604,406	429,255
Unaffiliated	7,480,816	6,656,176	6,593,296	6,015,176	886,985	638,222	535	2,777
Residuals								
Affiliated	n/a	8,163,410	n/a	3,182,761	n/a	4,771,871	n/a	208,779
Unaffiliated	n/a	3,564,512	n/a	2,532,121	n/a	829,889	n/a	202,501

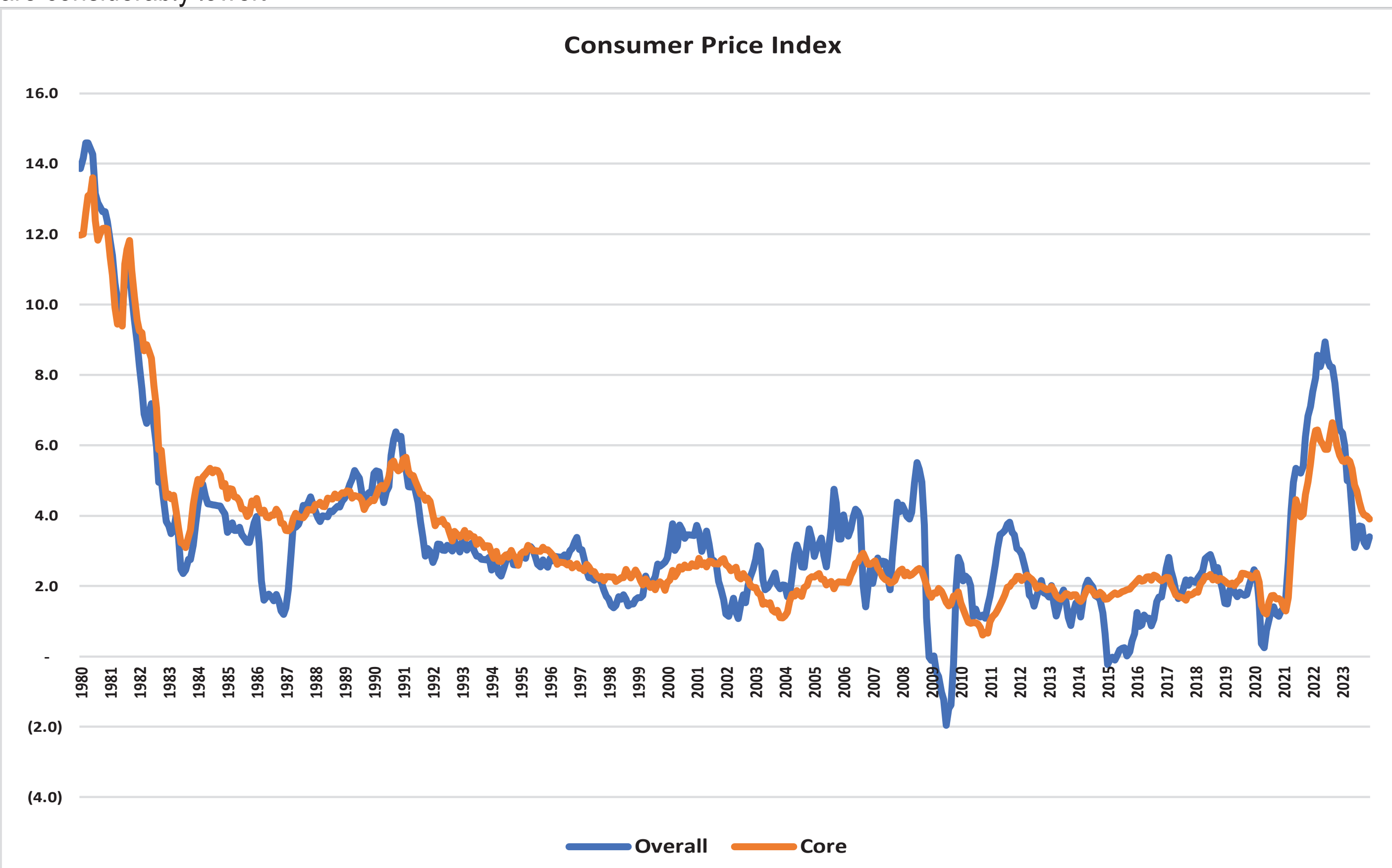
While investments in bonds, mortgage loans and common stock represent the bulk of invested assets, other asset types occasionally garner heightened interest among regulators. Two recent examples are Collateral Loans, which are reported on Schedule BA, and Residuals, which had been reported on Schedule D as either Bonds or Common Stock but beginning in 2022 were also reported on Schedule BA. Collateral Loans are structured as fixed income-like instruments but in many cases the assets pledged as collateral may be equities. Residuals are likewise fixed income instruments. As the first tranche to absorb losses from a Structured Security transaction, valuations will be significantly impacted by even small upticks in defaults of the underlying assets.

(000s)	Insurance Industry		Life Insurers		P&C Insurers		Health Insurers	
Derivatives	2021	2022	2021	2022	2021	2022	2021	2022
Carrying Value	37,736,738	17,514,973	37,746,812	17,571,469	(5,318)	(58,548)	(4,755)	2,053
Fair Value	49,650,980	7,200,853	49,719,960	7,242,872	(22,753)	(32,725)	(46,227)	(9,293)

Life insurance companies are significant participants in the derivatives markets. Activity tends to concentrated in two areas. One is in interest rate hedging strategies. The second is in equity hedges against crediting rates for different annuity products. The significant increase in interest rates and drop in equity markets in 2022 impacted both of those hedging strategies. Since these are hedging strategies, there should have been an offsetting change in the hedged instrument. However, significant volatility which did continue throughout 2023 may impact the effectiveness of those strategies.

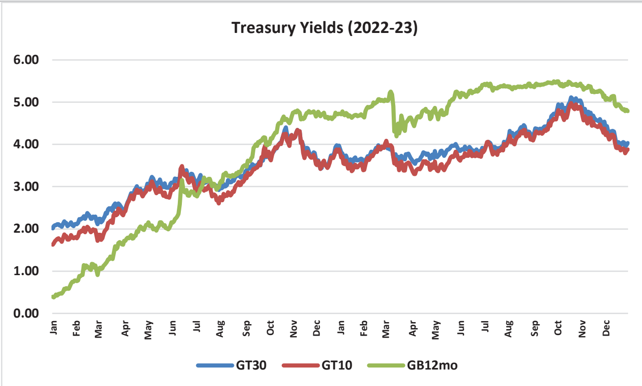
Inflation

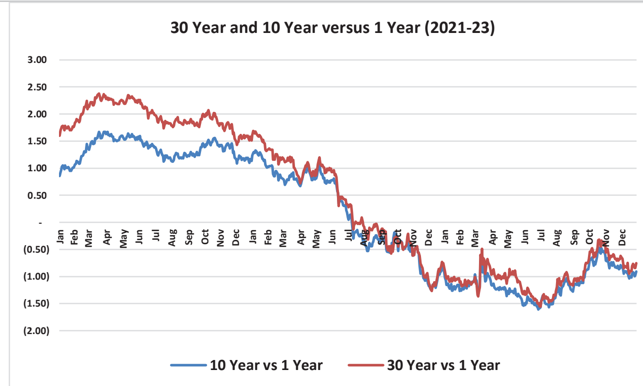
A continuing headline in 2023 was inflation, as indicated by year over year percentage changes in the Consumer Price Index ("CPI"). The CPI began increasing at the end of 2021, reaching levels in 2022 that had not been seen since the 1980s. Here I focus on two metrics – the Overall CPI and the Core CPI. The Core CPI excludes food and energy as those two contributors to CPI can be very volatile from month to month. The jump in both of the CPI metrics were largely driven initially by supply chain issues that were a continuing holdover from the COVID-19 Pandemic in 2020. However, other factors contributed such as a spike in oil prices that was related to the Russian invasion of Ukraine. Housing costs were also a significant component as population migrations overtook available supply. Overall CPI peaked in June of 2022 at 9.1%. Core CPI peaked a few months later, in September, at 6.6%. The Fed began taking aggressive action in early 2022, raising the target range for Fed Funds repeatedly. The pressure on borrowing rates did slowly lead to moderation in both of the metrics. Overall CPI came down to 3.4% and Core CPI to 3.9% by December 2023. This continues to exceed the Fed's stated target of 2.0% inflation. The Fed's policy response in 2022 also led many economists and market participants to believe that the risks of a recession were high. This concern has since declined and more recent surveys of economists *(Wall Street Jorunal – "It Won't Be a Recession, It Will Just Feel Like One". 1/14/24)* indicate that expectations for a recession are considerably lower.



Interest Rates

With the last increase by the Fed in July 2023, the Fed Funds target stood at 5.25% to 5.50%. With the significant resulting decline in inflation, a developing consensus in the marketplace is that the Fed will begin to lower interest rates in 2024. At the most recent meeting of Fed policymakers in December 2023, the Fed did note in its official statement that continued moderation in inflation could result in interest rate decreases later in 2024. Comments from members of the Fed and reported by various media sources since December have emphasized the need to see further declines in inflation before any decreases.

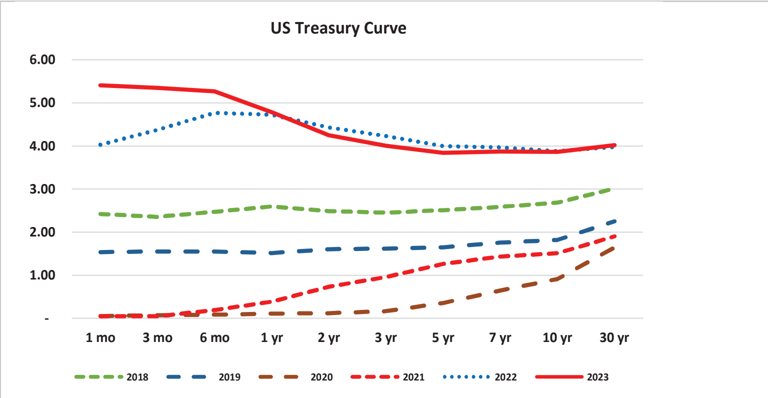


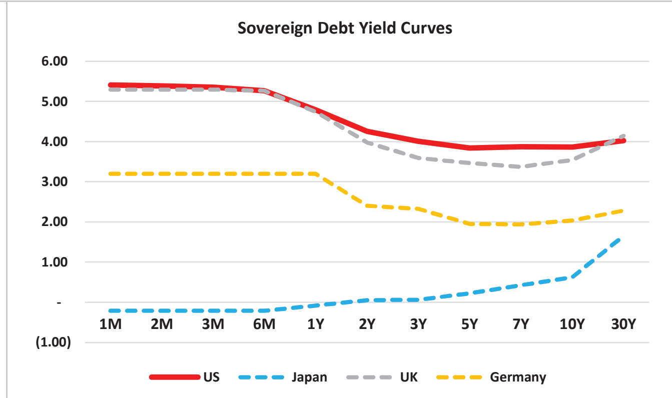


While the Fed increased the Fed Funds target aggressively in 2022 and into 2023, the market throughout that time period contemplated the likelihood of a recession that longer term would push the Fed to lower interest rates quickly. The result was an inverted yield curve in which longer term Treasury yields were lower than those on shorter maturities. Inverted yield curves are not commonplace. In the last 40 years, the Treasury yield curve has been inverted less than ten times, and each time this generally was not by a significant amount and lasted only a few months. Using the differential between the 30-year and 10-year Treasuries to the 1-year Treasury as a measure, the Treasury yield curve first became inverted in July 2022. The steepest point of inversion was in June 2023 when the negative spread was by approximately 150 basis points. After that there was a relatively rapid flattening until the negative spread was only 50 basis points before a reversal in the trend to a differential of a little more than 80 basis points at the end of the year. This is slightly more than what it was at the end of 2022.

Interest rates as represented by the Treasury yield curve continue to be high in comparison with where they were from 2008 until 2020, when the Fed acted in the wake of the COVID-19 Pandemic. Substantial portions of insurance companies' fixed income investments were made prior to 2020. With the increases in interest rates of 2022 that have been sustained through 2023, the fair market value of those investments was negatively impacted. A comparison of the overall fair market value of Bond portfolios in comparison with carrying value likely will show that fair market values are materially lower than carrying value. For longer dated holdings this may be by a substantial amount. This may have significantly impacted liquidity planning at many insurance companies. Most bond investments are carried at amortized cost on the assumption that they can be held until maturity. If that turns out not to be the case and the assets need to be sold, the sale could be at a significant realized loss which would then also impact Surplus. This is a dramatically different scenario than what may have been the case a few years ago.

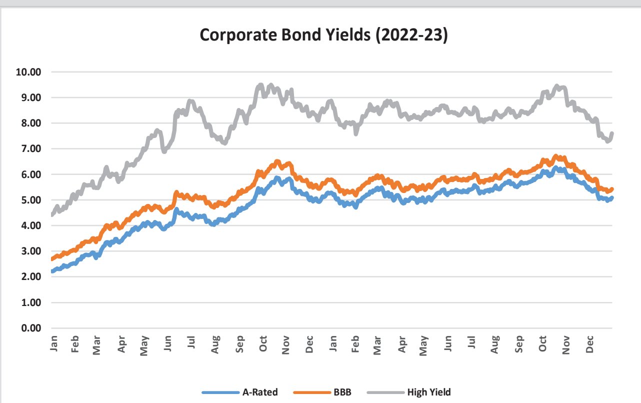
Certain specific asset classes may also have been impacted in other ways. Residential Mortgage-Backed Securities ("RMBS") are susceptible to significant changes in cash flows based on prepayments of the underlying mortgage loans. As interest rates rose, prepayments may have declined resulting in substantially less cash inflows in comparison with what insurance companies were expecting. This would also impact the fair market value of RMBS as they become longer dated holdings that are valued off of the longer end of the yield curve. Additionally, Bank Loans are typically floating rate instruments. As shorter-term interest rates rose even more than longer term interest rates, the cost to those borrowers increased significantly. This would negatively impact the borrowers' cash flows and their creditworthiness. These conditions may make it more difficult for Bank Loan borrowers to refinance at maturity.

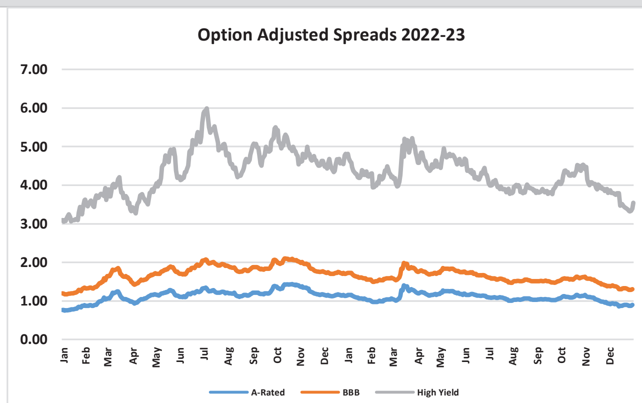




The curve inversion has the potential for creating significant anomalies in the fair market value of different instruments. One area for special focus is interest rate related derivatives used in hedging. Different interest rate hedging strategies may be impacted in different ways as the value of longer dated swaps will differ from shorter dated ones, and derivatives that use shorter duration risk to offset longer duration risk may be affected in unusual ways. There were significant changes in the fair market value of different interest rate hedging instruments at the end of 2022. Dramatic curve inversions such as this may impact determinations of hedge effectiveness both for economic and Statutory Accounting purposes. U.S. insurer holdings of bonds issued by non-U.S. entities are not that significant, but investments in those will be impacted differently and to different degrees. Different interest rate markets have also impacted foreign currency exchange rates. Any non-U.S. dollar investment that has not been hedged effectively will see material differences in valuations.

Investment Yields

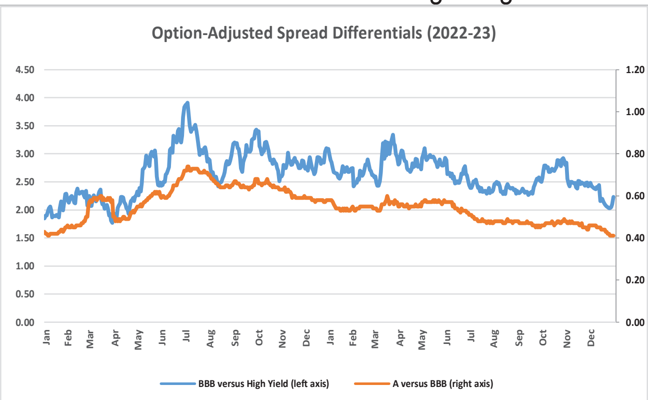


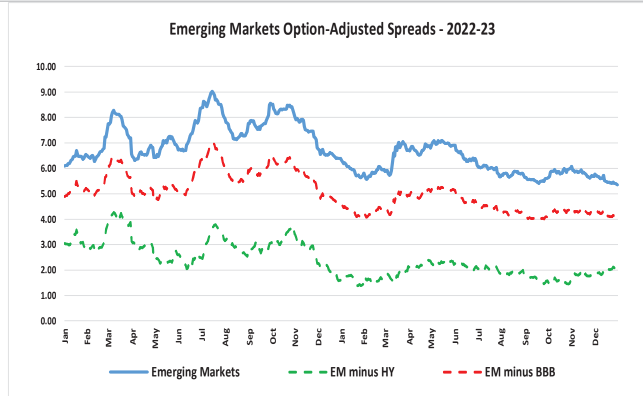


In 2022, Corporate Bond yields rose both because of the rise in Treasury yields and a widening in credit spreads. This was the case across all credit qualities. By the end of 2022, yields on A-rated and BBB-rated Corporate Bonds were around 6%. Both of those stayed relatively stable throughout 2023 before sliding at the end of the year to around 5%. There was some volatility in credit spreads for those two benchmarks over the two years. However, variation from year to year was not significant. The trend line for high yield bonds was different, whether focusing on the overall yield or the credit spread. This is due to more significant shifting sentiments for the likelihood of default. In the summer of 2022, high yield credit spreads spiked to 600 basis points before moderating to around 450 basis points by the end of 2022. While there continued to be significant volatility in this measure through 2023, the trend was generally downwards and ended 2023 at about 350 basis points. As was the case for other metrics, this reflects decreasing concerns about a recession and that realized defaults in 2022 and 2023, while they were higher, were not as high as some had feared.

The general trends in credit spreads are also reflected in the differentials between credit qualities. The differential between A-rated and BBB-rated Bonds rose from 40 basis points to 75 basis points in July of 2022, and by then end of 2023 was back to 40 basis points. Not surprisingly, the differential between high yield and BBB-rated Bonds is considerably more volatile. While this differential is significantly lower than its peak of 400 basis points back in July 2022 and the 300 basis points at the end of 2022, it is still higher than where it started in 2022. At the end of 2023, it was at about 230 basis points.

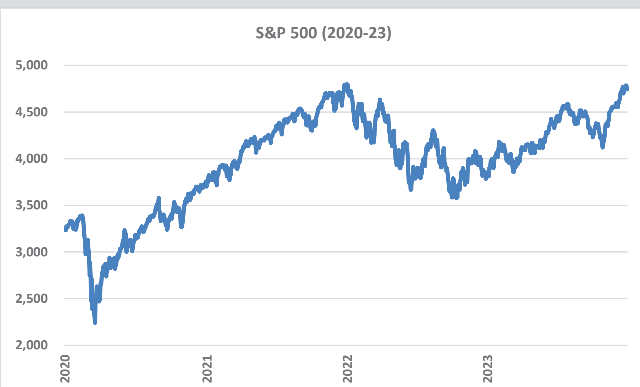
An additional comparison worth considering is the Emerging Markets Debt index. This consists of the debt instruments at the weaker end of investment grade and just below investment grade credit qualities. Option-Adjusted spreads also spiked in 2022, which is also reflected in the differential to U.S. Corporate Bond indices. In all of these measures, these metrics have trended back to levels at the beginning of 2022 or better.

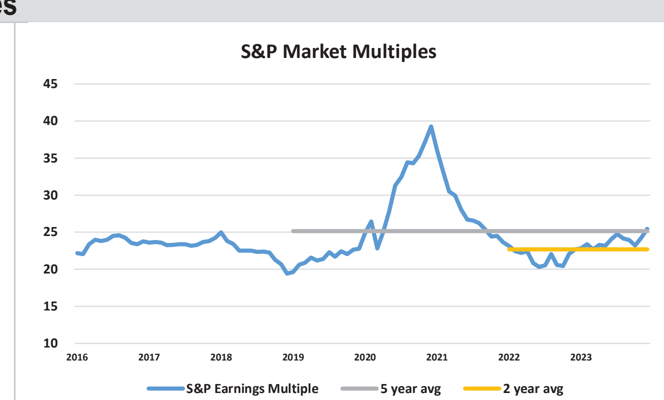




There is more to be considered. One key item is what is going to happen with interest rates. An inverted yield curve is an anomaly, the current inverted yield curve has already lasted longer than most past incidences. If the Fed holds short-term interest rates steady or only lowers them slightly, what will happen to longer term interest rates? If the economy does avoid a recession and is navigated to a "soft landing", there is reason to think that any lowering of interest rates does not have to be significant and would also be gradual. That argues that market expectations would need to necessarily shift and the pressures that have kept long-term interest relatively low would moderate, leading to long-term interest rates rising. A more typical yield curve has 30-year and 10-year Treasury yields about 150 basis points higher than the 1-year Treasury yield. An increase of 150 basis points on the longer end of the yield curve, on top of the increase that already occurred in 2022 and stayed in place in 2023, would further impact the fair market value of an U.S. insurance company's Bond holdings. This would be especially the case for Life insurers given their tendency to invest in longer dated Bonds to match liabilities.

Equities

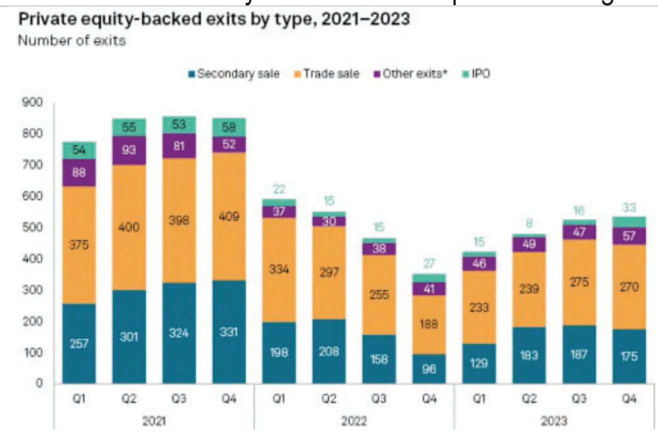




While equity holdings are less significant as an asset class for U.S. insurance companies, fair market values are more volatile. Carrying values are also at fair market value, which therefore has a more immediate impact on an insurer's capital and surplus.

In 2022, the S&P 500 declined 19.4% and at one point was down 25% from year-end 2021. This decline was reflected in the dollar exposure to common stock which declined by more than 10% from 2021 to 2022. In 2023, the S&P 500 more than reversed the 2022 decline, closing the year up 24.2%. It would not be surprising to see year-end reported exposure to have also reversed the 2022 decline. The performance of equity markets can be typically tied to different measures including price-earnings multiples. In the graph on the right above, the market multiple for the S&P 500 trended upwards in 2023. It is now roughly in line with the most recent five-year average. This reflects stronger expectations for earnings growth in the near term furture.

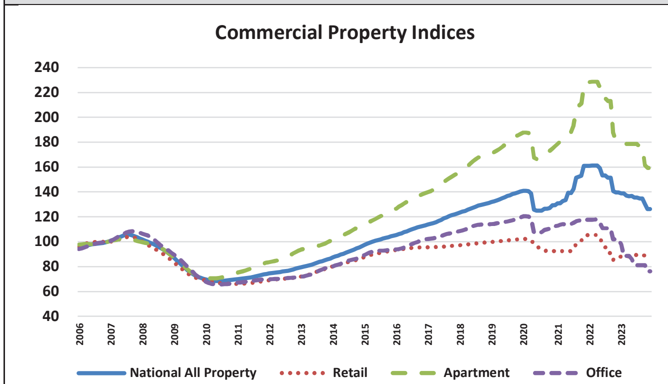
As noted earlier, what may have occurred with insurance industry holdings on private equity funds is more difficult to gauge. Valuations of many private equity funds did not follow the downturn in public equity markets in 2022. This raised many questions among analysts. However, there may have been reasonable justifications for that. Will the signficant improvement in public equities in 2023 be reflected in fund valuations? One measure that suggests otherwise is information on private equity exits. This is tracking of private equity fund sales of their underlying holdings. This can happen through two main avenues – secondary sales and initial public offerings. S&P recently published data that it had acquired from Prequin.



Source: S&P. Data from Prequin

This data shows that 2022 exits were significantly lower in 2022 as compared with 2021 and did not materially recover in 2023. While this may reflect on valuations of private equity funds, it also leads to questions about distributions to fund partners, including insurance companies. Distributions to fund partners can only occur when the fund managers can sell assets. An additional layer on top of lower distributions from private equity funds is if capital calls on unfunded commitments may have increased in the last two years.

Commercial Real Estate Values



Source: Various including NCREIF and Green Street.

As U.S. insurance company investments in real estate related assets have increased over time, albeit mostly in the form of mortgage loans, commercial real estate valuations have become a more material consideration. The last two years have seen significant declines in the national index data. All Property measures declined 9% to 10% in 2023. The worst performer was Office which was down 25%. Apartment, which had seen a significant rise after the Pandemic, declined 12%. Retail, which has been struggling for some time, declined 1%.

Perhaps more significant than the overall declines in different property types over the last 12 to 24 months is the volatility. National index data has more typically reported relatively small changes from month to month. In 2022 and 2023, month to month declines have been as much as 9% or 10% for individual property types. This is reflective of much greater uncertainty in commercial real estate values. In theory this means that a mortgage loan underwritten with a 70% loan-to-value could actually be an 80% loan-to-value immediately after closing. What is more likely is that the value of commercial real estate, which has always been somewhat idiosyncratic from property to property, has become even more so. The data also shows that different property types, which generally moved in unison, have significantly diverged. The Retail sector has been struggling for many years but may have finally stabilized. Apartment, which most likely saw some excessiveness in valuations immediately after the Pandemic, has retracted. The property type warranting the greatest concern is Office, especially properties in Central Business Districts. Work-from-Home arrangements have become much more the norm after the Pandemic. Vacancy rates based on the amount of unleased space have reached 15% or more. This however understates the issue. Actual occupancy rates in many Central Business Districts are noted in various media reports more around 50%. What has happened is the leases that were set to expire in the last couple years were extended while companies decided what to do with their space. Likewise many mortgage loans were extended. The deferral of the issue may be at its end. As property owners for some properties continue to be unable to fill their square footage, they will be unable to refinance, especially at current interest rates. This problem to some degree was exacerbated by the banking turmoil as mid-sized banks have been substantial lenders to commercial property owners. More conservative lending practices at those institutions will also limit the availability of financing.

Closing Thoughts and a Few More Questions to Consider

Economic uncertainty, high inflation, and a sharp rise in interest rates came together in 2022 to negatively impact virtually every asset class and investment practice. This led to both realized and unrealized losses. Economic uncertainty and market volatility continued throughout 2023.

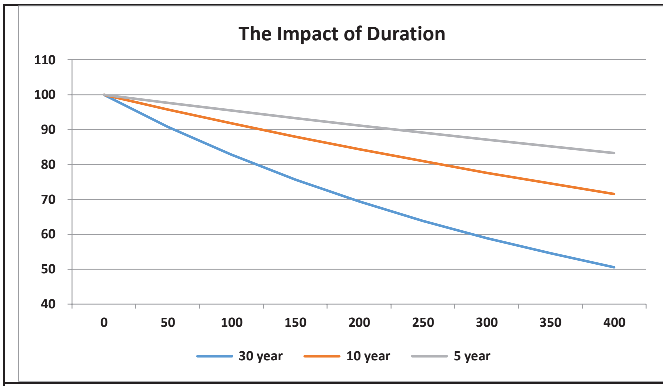
Some of the issues facing insurers at the beginning of 2023 moderated during the year. Defaults among Corporate Obligations did increase during the year, but not to the degree that some had expected. This includes Bank Loan borrowers which are owned directly and through Collateralized Loan Obligations ("CLOs'). There does continue to be some concern along these lines. Besides the potential for defaults is the potential for downgrades by rating agencies. The impact here could be felt most across those bonds that are rated BBB-minus and are on the cusp of being moved to below investment grade. In that case, the resulting declines in fair market values could be significant.

Other issues also continue to be relevant. With higher interest rates, insurers have been able to invest in new bonds and mortgage loans with higher yields. However, existing holdings of bonds and mortgages loans saw their fair market values decline in 2022 with likely no significant improvement in 2023. Those declines were significant for longer dated investments. Bond portfolios overall were reported at the end of 2022 with fair market values that were lower than carrying value. If longer term interest rates rise to reverse the inverted yield curve, this would increase the shortfall. RMBS valuations were under additional pressure because of lower prepayment rates. There is no immediate impact if insurance companies hold these investments to maturity. However, if there is a need to sell, or a desire to sell to reposition the portfolio, this would result in realized losses. Realized losses would impact Surplus and would also impact Interest Maintenance Reserves ("IMR") for Life insurers. The NAIC's Statutory Accounting Principles Working Group recently adopted interim guidance that allowed some negative IMR to be treated as an admitted asset. Also, while there has not been any significant new information, market concerns about mid-sized banks have not completely dissipated.

2023 also saw some concerns increase. Uncertainty in the commercial real estate sector significantly increased, especially for the Office sector. The question is if current difficulties will turn out to be a cyclical downturn that can be weathered, or if this is a more fundamental change in the dynamics of the sector.

Low interest rates for more than ten years was a challenge to most insurance companies, but that was also coupled with relative stability. An important question for regulators is if that led to some complacency in risk monitoring and management at the insurance companies. Market volatility has returned and does not show any immediate signs of going away. Perhaps more importantly is how that market volatility impacts liquidity planning. Many insurance companies stretched for yield by shifting to less liquid assets, investments that were more complicated and bonds that were longer in duration. Does the insurer have a robust liquidity policy and is the liquidity stress testing adequate? Lower fair market values and stretching out cash inflows from investments won't have a material negative impact on the insurer if it can continue to hold the investment. Key to this question is also the potential for volatility in cash flow demands from the liability side of the equation. Higher investment yields may have also impacted policy surrender and lapse dynamics among Life products.

Case Study Illustrations



	Average Life		
CPR	**Short**	**Intermediate**	**Long**
0.0%	6.60	15.96	25.46
2.5%	3.38	8.76	16.11
5.0%	2.38	6.17	12.18
7.5%	1.90	4.78	9.92
10.0%	1.61	3.95	8.39
20.0%	1.13	2.40	5.25
25.0%	0.93	2.08	4.45

A simple illustration of interest rate related risk is what happens to different bond maturities (30-year, 10-year and 5-year) with different levels of interest rate changes, in 50 basis point increments up to 400 basis points. At the extreme end, a 30-year bond would lose half of its fair market value with a 400 basis points increase, while the 10-year and 5-year bonds would lose 30% and 15%, respectively. Further complicating this calculation is the impact of rising interest rates on RMBS, both Agency-Backed and Non-Agency Securities. RMBS investments are typically modeled at time of purchase with a certain Constant Prepayment Rate ("CPR"). In the illustration above, a 10% CPR would mean an expected average life of 1.61, 3.95 and 8.39 years, respectively, for the different tranches. As interest rates rise and actual prepayment experience declines, perhaps to zero, those bonds extend to 6.60, 15.96 and 25.46 years, respectively. Cash flows decline dramatically, and valuation is on the longer end of the interest rate curve, further impacting liquidity issues.

Duration Category	Weighted Avg Duration	% of FV	% of CV	FV/CV	Revised FV/CV
< 2 years	0.90	10%	11%	102%	99%
2 - 5 years	3.66	19%	20%	104%	95%
5 - 10 years	7.07	26%	27%	107%	92%
10-20 years	14.45	38%	36%	115%	85%
20+ years	24.40	7%	7%	111%	67%
Grand Total	9.55	100%	100%	109%	89%

The table to the left is an illustration of how the increase in interest rates and investment yields may impact a typical Life insurance company bond portfolio. With a distribution across different duration buckets and fair value estimates as of year-end 2021 in comparison with carrying value, the portfolio had a fair market value equal to roughly 109% of carrying value. With the change by year-end 2022, that relationship would have declined to 89% with the most significant change in the longest duration category, declining from 111% to 67%.

Under general considerations, a decline in fair market value of the bond portfolio does not have a direct impact on a U.S. insurance company as long as it can continue to hold those bonds until they mature. Nonetheless, this shift does impact liquidity considerations and any liquidity stress testing that the insurer does. A more direct and immediate impact is on any bonds that are pledged as collateral where the collateral requirements rely on fair market values. Two significant areas are those assets pledged to Federal Home Loan Banks and to derivatives counterparties. A material decline in fair market value of those assets could lead to a need to add additional assets, further impacting the insurer's liquidity profile.

This document is intended to provide a general overview of the 2023 market conditions and thoughts on implications to the insurance industry. It is not intended to provide investment advice, nor is it intended to suggest specific risks or actions for any given insurance company. Actual impacts on investments and individual insurers will depend on a range of facts and circumstances and any such analysis is beyond the scope of this briefing.

About the Author

Edward L. Toy is Director, Investment Specialist with Risk and Regulatory Consulting (RRC). Ed is the firm's Investment Practice Lead where he has a focus on supporting financial examinations and analysis of U.S. insurers. He has 40 years of experience in capital markets and has been deeply involved with state insurance regulation for 30 years. Before joining RRC in 2018, he was with the National Association of Insurance Commissioners (NAIC). Ed founded the NAIC's Capital Markets Bureau and held the position of Director for eight years. He worked with state insurance regulators in the development of tools for oversight of the insurance industry as they relate to investment portfolios. He was also chair of the Macro-prudential Policy & Surveillance Working Group of the International Association of Insurance Supervisors (IAIS), supported the NAIC's representative to the Financial Stability Oversight Council (FSOC), and was a member of FSOC's Systemic Risk Committee.

Prior to joining the NAIC he was a portfolio manager and director of trading with Artesian Capital Management, a hedge fund focused on arbitrage opportunities in corporate credit. Before joining Artesian, he was a managing director at Teachers Insurance and Annuity Association (TIAA), which along with its affiliate, the College Retirement Equities Fund (CREF), was one of the largest financial services organizations in the U.S. and the largest retirement system in the world. His last responsibility at TIAA was as portfolio manager for the convertible securities group. He launched the group in October of 1997 and was successful at building and actively managing a portfolio of publicly registered or 144A convertible securities. Immediately prior to those responsibilities, Ed was part of the Structured Finance Group where he was primarily responsible for the group's non-agency residential mortgage-backed securities portfolio. In addition to his investment responsibilities, Ed also managed the credit risk and prepayment cash flow modeling functions for the mortgage-backed portfolio. From 1983 to 1988, Ed was a generalist in the Private Placement Group. From 1988 to 1990 he managed the division's private placement high yield effort. In 1992, Ed served as special assistant to the chairman of TIAA-CREF.

While with TIAA, Ed was very active in the regulatory arena working with the NAIC. Over that period, Ed's involvement included work on the Model Investment Law, the replication (synthetic assets) project and various efforts to improve regulatory effectiveness. He was also instrumental in industry efforts assisting in the development of regulatory guidance for a variety of asset types. He chaired the Asset Valuation Issues Committee of the American Council of Life Insurers.

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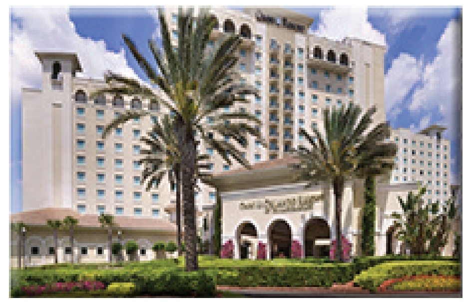

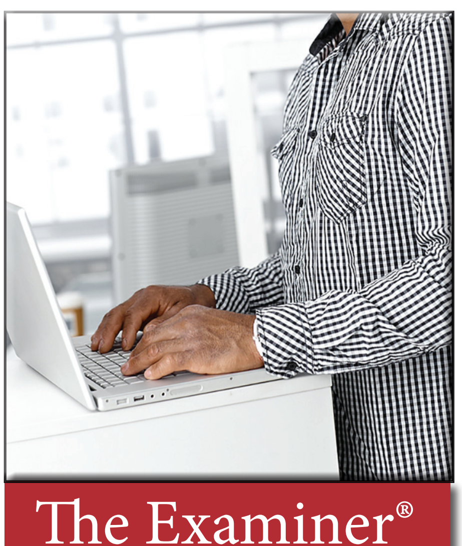

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