

Future of actuarial pricing

Achieving sophistication

Overview

Actuaries now have the opportunity to integrate artificial intelligence (AI)-powered technology to achieve critical business outcomes, especially pricing sophistication. Applying new capabilities will give actuaries an opportunity to participate in and lead broader business strategy discussions.

Actuarial science utilizes complex analysis, vast quantities of both structured and unstructured data, and specialized domain knowledge. Given this, AI is likely to serve as a powerful tool to augment and amplify actuarial impact. Industry leaders have begun the transformation in leveraging AI solutions to price and evaluate risk. Our view is that the actuarial function should lead that transformation, rather than follow it.

While the transformation coming to the actuarial profession is technology-driven, the response most likely to succeed is people-driven.

Actuaries will need to seize their leadership role in pricing and become even more integrated with other critical parts of the business, such as claims, underwriting, product, and marketing. That integration will allow for strategic planning that a more siloed organization cannot manage and ensure the actuarial function's prominent role in strategic discussions for decades to come.

The choice is clear: Actuaries can't easily afford to continue doing their work as they always have done, given the analytical and labor-saving capabilities of AI-powered tools now emerging. Actuaries need to move from the back office to front-row seats at the strategy table.

As this paper makes clear, actuaries will need to do new things and act in new ways. With transformation, there will come significant opportunities that yield even greater value to the entire enterprise.

The cost of complacency

While combined ratios continue to run below 100% in multiple lines of business, there is little urgency to do things differently. However, the profession's ability to forecast and formulate a response to insurance trends has been severely tested by recent events, such as the global pandemic, inflation, and escalating natural disasters.

While some actuarial teams have nimbly adapted and adjusted pricing and business strategy, others have struggled to keep pace. In the year following the COVID pandemic, costs for personal auto physical damage coverage jumped nearly 40%. Companies who were slow to recognize this trend experienced a 10% or greater deterioration in their underwriting results. Such a trend in loss costs, if compounded across the entire US property and casualty sector for just six months, would have led to the loss of nearly \$18 billion in potential written premiums.

The post-pandemic surge in auto claims was a by-product of the supply chain disruptions in both new and used auto markets caused by pandemic-related shortages, pent-up demand, and a concurrent surge in monetary supply. These factors might not have been immediately visible to all functions within the enterprise. That said, actuarial functions in coordination with other departments that had an effective monitoring mechanism in place were able to sense the shift and react much sooner than the overall insurance market.

Pricing sophistication

One of the most promising areas for application of AI-powered tools is in pricing sophistication. This goal has been at the heart of the profession's charge for the past few decades. Maintaining a competitive edge in the marketplace is a priority—and AI has enabled actuaries to provide even more guidance to business leaders.

Take the example of the rapidly maturing cyber insurance market—the market has seen explosive growth over the past 10 years, but greater pricing competition among carriers has placed more emphasis on non-rate pricing actions, such as non-renewal of less profitable classes or tighter underwriting standards.

Additionally, the types of cyber-related claims are changing as well. We are seeing fewer data breaches exposing personally identifying information and more ransomware attacks of individual entities. This rapidly shifting environment, which affects both profitability and risk exposure, has challenged actuaries to revamp pricing approaches overnight.

In the cyber insurance market, leading carriers have harnessed AI-powered data collection and generation to inform not just pricing decisions, but also pre-policy risk assessment, risk control, loss avoidance, and post-claim response efforts. The explosion of available data gives actuaries the ability to create more sophisticated pricing models to better match price to risk and provide better strategic, data-driven guidance to other functions to manage profitability.

AI-powered tools also have important implications for monitoring the competition. AI allows for digesting thousand-page filings in seconds to pull out pertinent information. This analysis provides meaningful insights into competitor profitability, but also it can close blind spots in a carrier's pricing—for example, what variables are other companies using? However, competitors can do the same, and a company's pricing strategy and algorithm have never been more exposed. Insurance companies must ask themselves what insights they are sharing with the market.

Model building and testing

Relatedly, AI can help in model building and testing. Agentic AI models offer actuaries the ability to rapidly test multiple permutations of traditional models. This yields rating variables and factors that best achieve business objectives. In the cyber marketplace, for example, AI-powered tools have made it possible for actuaries to more quickly

explore potential new rating variables and adjust their pricing models to match changes in underlying risk exposures.

Pricing actuaries are now able to discover more potential interactions between variables, evaluate the impact and disruption to the current book of business, and anticipate effects to underwriting performance. Actuaries have always tried to detect signal from the noise; AI-enabled tools help them deliver on that goal.

With advanced data and AI-powered analysis, actuarial teams can build more sophisticated, unconstrained models to inform pricing actions. Unconstrained pricing models are more sophisticated pricing models that provide additional guidance to underwriters on the true underlying cost of coverage. Even if these models do not find their way into a rate filing, they provide strategic direction to the rest of the business on the expected profitability of a potential policy.

Use of agentic AI models to iterate through traditional pricing modeling activities can produce a rate filing without using black box computations and analytics that regulators would reject.

Finally, these unconstrained pricing models in combination with a carrier's in-force book of business can be tested against multiple economic and event-driven scenarios. This allows actuaries to see how much disruption would ensue if they tried different strategies or experienced a range of unexpected economic events.

Leading strategic discussions

Actuaries have gradually begun taking a more active role in forward-looking discussions, rather than limiting themselves to discussing what has happened in the past.

For example, actuaries can advise marketing teams on customer segmentation to maximize lifetime customer value, or they can help bring rigor to the process of refining and evaluating underwriting guidelines. Actuarial techniques can be integrated into more tasks than the rate indication. Pricing actuaries can play a role in designing, implementing, and monitoring marketing, distribution, and other function strategies.

Actuarial pricing leaders should work closely with other functions—underwriting, reserving, claims, sales, and marketing—to share emerging information, explore options, and evaluate performance against expectations. The ability to share, see, and respond to information collaboratively is a competitive differentiator. In our experience, this capability explains the agility of auto insurance companies who reacted swiftly to the significant post-pandemic inflation versus those who lagged. The key was not necessarily data quality—it was collaboration.

To increase organizational impact, the actuarial function will need to master AI and other technologies now in the profession's toolbox. Ideally, the actuarial function gives the business a range of plausible outcomes from a variety of scenarios.

For example, actuaries can paint a picture of what it would take for loss ratios to rise beyond a certain threshold—what factors would likely lead to such an outcome and what the probabilities of such factors occurring appear to be based on certain assumptions. It's not just about supporting the business on the upside—it's also about protecting it, or at least keeping the business aware of the potential downside.

An agenda for action

Pricing actuaries, by taking specific actions, can deliver more to the overall enterprise and demonstrate even greater value. Here are three key areas to focus on:

- **Invest in critical technology.** Leveraging AI will allow actuaries to deliver exponential value by driving more segmentation, uncovering and integrating new data, and creating more ways to stay competitive.
- **Produce more business-specific insights.** By articulating and analyzing a range of possible scenarios that drive the company's bottom line—such as macroeconomic shocks and

other scenarios—actuaries can lead the discussion on business strategy and potential responses.

- **Build relationships across the business and across all levels.** Actuaries should integrate with claims, underwriting, product, and marketing to amplify the impact of their work and build trust and influence.

With these outcomes, actuaries will have a seat at the table where strategy is set. They will be able to lead conversations about new ways to price products, market to customers, and build competitive positions in the marketplace.

Moreover, the actuarial function will be able to produce efficiencies in its own work. By deploying technology to its primary strategic goals, actuaries will be able to do essential work more efficiently and cheaply and produce margin-enhancing benefits to other areas of the business. In future pieces of thought leadership, we will explore these opportunities for efficiency.

Contacts

Matt Carrier

ACAS, MAAA
Principal
Deloitte Consulting LLP
macarrier@deloitte.com
+1 312 486 3904

Jim Arns

ACAS, MAAA
Senior Manager
Deloitte Consulting LLP
jarns@deloitte.com
+1 312 486 4546

Tom Lapinski

FCAS, MAAA
Manager
Deloitte Consulting LLP
tlapinski@deloitte.com
+1 617 437 3365

Kelly Cusick

ACAS, MAAA
Managing Director
Deloitte Consulting LLP
kcusick@deloitte.com
+1 312 486 2480

Stefan Peterson

ACAS, MAAA
Senior Manager
Deloitte Consulting LLP
speterson@deloitte.com
+1 312 486 1463

Jack Richards

FCAS, MAAA
Senior Consultant
Deloitte Consulting LLP
jackrichards@deloitte.com
+1 312 486 1236



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