Notice to All Stakeholders

AI & ML Survey Results

Notice 11-2023
October 3, 2023

Purpose

The Automobile Insurance Rate Board (AIRB) is issuing this notice to announce the publication of our findings from survey on Artificial Intelligence (AI) and Machine Learning (ML).

Background

Although the insurance industry has traditionally been slow to adopt new technologies due to manual processes, legacy systems, and compliance requirements, in recent years we have seen a surge in AI applications tailored specifically to optimizing the insurance lifecycle including the pricing of auto insurance.

To better understand insurer plans for implementing AI and ML the AIRB sent a survey in June 2023 to industry stakeholders. This survey enabled the AIRB to learn directly from industry about their use and governance of big data and advance models and begin a dialogue with industry leaders. The results of the survey were used to inform our regulatory approach on the usage of advanced models.

Announcement

The findings of our review of insurers use of AI and ML are included in the Survey Results Report. The report includes our findings on the governance and use of advanced models in pricing, claims, fraud prevention, and marketing.

Action Required

Insurers interested in the results of our survey on AI and ML should refer to the attached report.

Should you have any questions relating to this Notice, please contact our office at (780) 427-5428 or by email: airb@gov.ab.ca.

Laurie Balfour, MBA, CPA, CMA
Executive Director

Attachment

1. 2023 AI & ML Survey Results

AI & ML 2023 Survey Results

Alberta Automobile Insurance Rate Board

Automobile Insurance Rate Board

2023 AI & ML Survey Results

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Overview

The insurance industry has traditionally been slow to adopt new technologies due to manual processes, legacy systems, and compliance requirements. However, with the surge in Artificial Intelligence (AI) applications tailored specifically to optimizing the insurance lifecycle, insurers are starting to realize the importance of leveraging AI. Two of the reasons insurers implement AI are process efficiency and cost savings.

The Automobile Insurance Rate Board (AIRB) knew of a few insurers adopting these technologies but was not well informed on those who may be thinking of adopting in the future. Therefore, in June 2023 we sent out a survey to industry about their usage of AI and Machine Learning (ML), collectively called "advanced models", and received responses from 12 insurer groups (respondents) which represent over 90% of the PPV market. While there are only responses from 12 insurer groups, they represent answers for more than 40 individual companies. Two insurer companies within the same group may target different business areas and can be just as different as two companies under different insurer groups.

The purpose of this survey was to:

1. Learn directly from industry about their use and governance of big data and advanced models and begin a dialogue with industry leaders.
2. Evaluate usage of big data and advanced models and inform a regulatory approach, if needed.

Some key takeaways from the survey are:

1. Smaller insurers are less likely to have advanced models, citing insufficient data and expertise.
2. Stage of implementation (in use versus in development) varies between insurers and is not dependent on market share.
3. The pricing business area is the most mature, while few insurers use advanced models for marketing.
4. The role of these models is primarily supporting staff, not fully automating tasks.
5. Insurers have robust internal governance over their models and data.
6. Direct writer insurers are more likely to use advanced marketing models.

Introduction

We chose to define AI and ML as:

> ***An automated process in which a system begins to recognize patterns without being specifically programmed to achieve a determined result. This is different from standard algorithms which execute a set of rules to solve an equation or problem in a predetermined fashion.***

This is a fairly restrictive definition, as some would consider simple models like Ordinary Least Squares (OLS) and General Linear Models (GLM) to be machine learning. However, for this survey, things which are not AI/ML include:

1. OLS, GLM, General Additive Models (GAM), since these have been around for a long time, and are well understood.
2. Pre-determined "If A, then B" algorithms, such as "phone-trees" which guide customers depending on their selections.

Things which are AI/ML include systems utilizing neural networks, or other deep-learning algorithms such as XGBoost, RandomForest, clustering models, support vector machines (SVMs), etc.

We asked each respondent to answer questions about their usage of advanced models generally, and then in four specific business areas:

1. Pricing;
2. Claims;
3. Fraud Prevention; and
4. Marketing.

Our final section discussed how these models in each business area are governed.

General Results

Of our 12 respondents, nine of them indicated they use, or plan to use, advanced models in some aspect of their business. The three insurers indicating they do not use AI/ML were all small insurers with less than 3% market share.

All three insurers who do not use, plan to use, and are not exploring the use of AI/ML, cited common reasons. Primarily, all these insurers lacked sufficient data volume and expertise. Developing an internal AI/ML system involves large up front costs for technical staff changing and expanding IT systems, etc.

75%

Of Insurers Use AI/ML

Model Usage

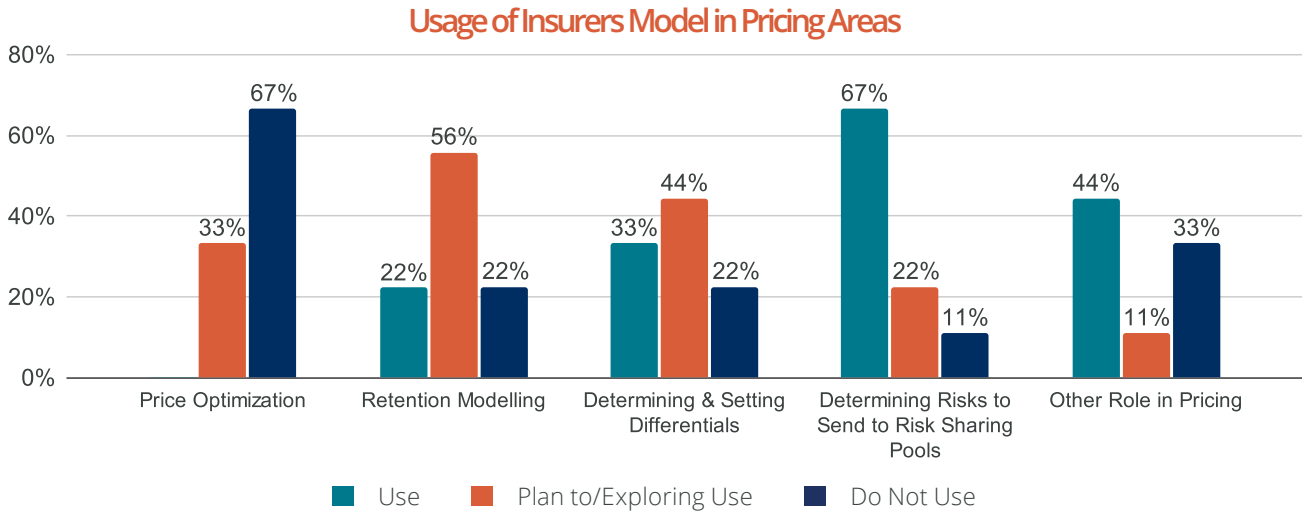
Pricing

100%

Of Insurers Use or Plan to Use for Pricing

All nine insurers who use advanced models use them for pricing. We asked respondents about their stage of usage for specific roles within pricing, which we define as:

1. **Price Optimization:** Utilizing demand modelling to determine the highest price which can be charged to retain a customer.
2. **Retention Modelling:** Estimating effects of a company-initiated rate change on the decision of current customers to remain with your company.
3. **Determining and Setting Differentials:** Utilizing advanced models such as XGBoost to determine pricing levels for each customer.
4. **Determining Which Risks to Send to Risk Sharing Pools:** Utilizing models to group high risk customers or other means of identifying the highest risk customers and sending them to risk sharing pools to minimize risk.



Other roles identified by respondents for pricing include:

1. Utilizing clustering methods to create rating territories;
2. Creating vehicle rate groups; and
3. Determining if the insurer should order a Motor Vehicle Record (MVR) report, as this costs money to the insurer. Therefore, they can save money by using a model which selects low risk applicants and does not order an MVR for them.

MVRs are used to determine if potential policyholder has had convictions.

We are closely monitoring the industry's usage of price optimization, as this is a deviation from current rates, which are priced by estimating the potential loss on a policy. The usage of advanced models to set the insurers rating differentials can benefit consumers as they usually outperform traditional models and allow an insurer to price closer to the actual cost of the policy.

Claims

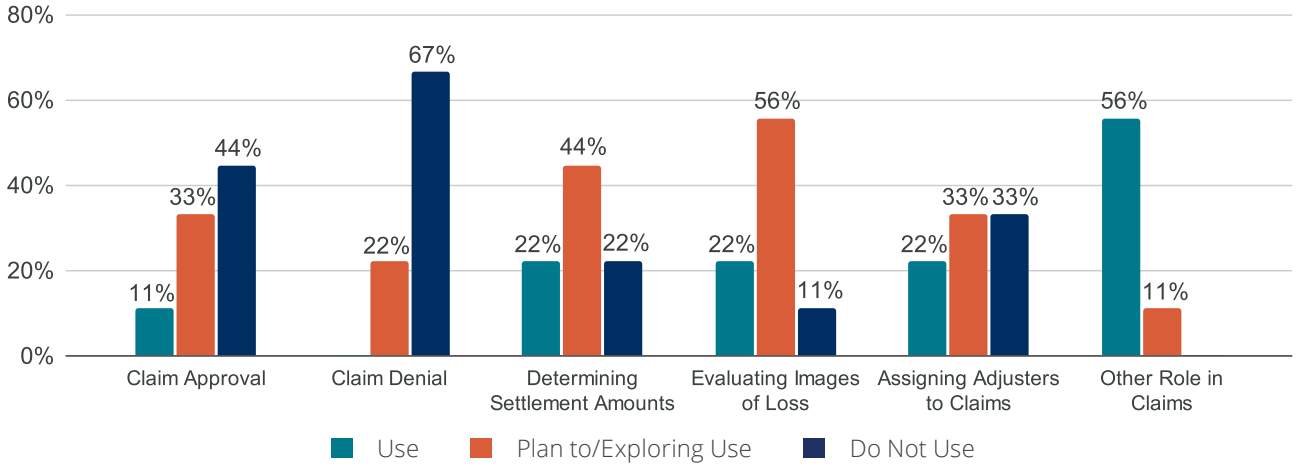
89%

Of Insurers Use or Plan to Use for Claims

Eight of nine insurers who use AI/ML use it for claims processing. We define the following usages within claims:

1. **Claim Approval:** Approving or accepting a claim submitted by a policyholder.
2. **Claim Denial:** Denying or rejecting a claim submitted by a policyholder [1].
3. **Determining Settlement Amounts:** Using information collected to determine a settlement.
4. **Evaluating Images of Loss:** Using submitted images of the claim to assist in determining settlement amounts.
5. **Assigning Adjusters to Claims:** Determining which of the insurers adjusters, if needed, should be assigned to a specific claim.

Usage of Insurers Model in Claims Areas



Other roles identified by respondents for claims include:

1. Adjusting claim frequencies for weather models;
2. Customer service;
3. Vendor routing (determining which garage in network to send policyholder); and
4. Automated reserving.

The target of claims models is improving process efficiency and assisting adjusters. This should improve the efficiency of reviewing claims, which can lower the insurer overall claim costs and can be offered back to policyholder through more competitive rates than insurers with inefficient claim processes.

[1] Insurer can deny a claim if the policyholder does not have the coverage claimed under, or if fraud has occurred.

Fraud Prevention

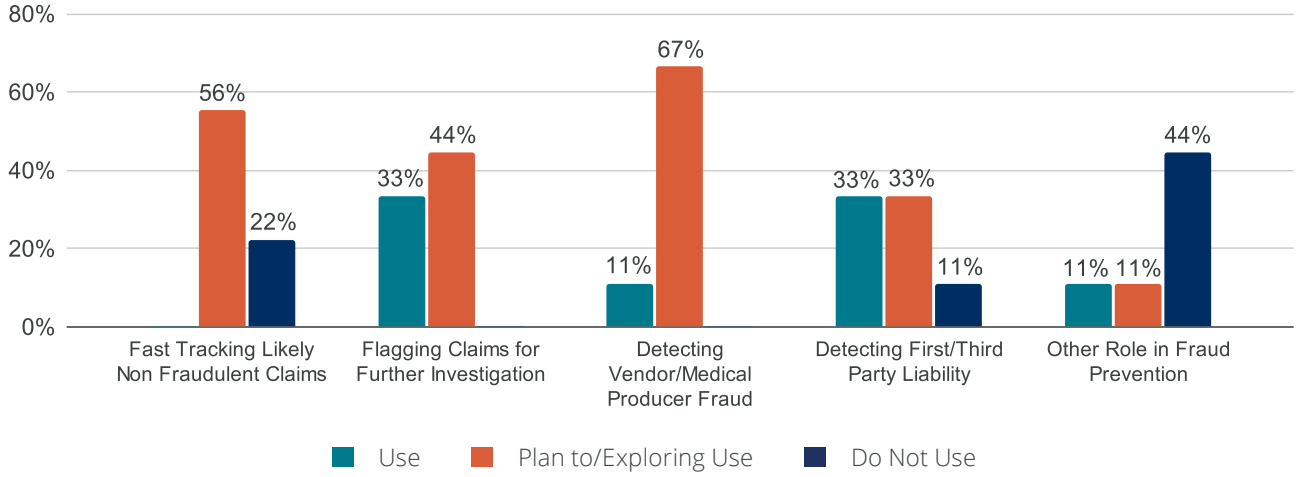
89%

Of Insurers Use or Plan to Use for Fraud

Eight of nine insurers who use advanced models use it for fraud prevention. For specific areas within fraud detection, which we define:

1. **Fast Tracking Likely Non Fraudulent Claims:** Identifying claims which are unlikely to be fraudulent and sending them to a faster claim process.
2. **Flagging Claims for Further Investigation:** Identifying claims which are serious or likely to be fraudulent which are given higher scrutiny.
3. **Detecting Vendor Fraud/Medical Producer Fraud:** Identifying claims where vendors, such as medical providers or autobody shops, may have submitted inappropriate or questionable amounts.
4. **Detecting First/Third Party Liability:** Identifying claims where a first party insured, or third-party claimant may have been at fault for a claim or misrepresented facts to the insurer.

Usage of Insurers Model in Fraud Prevention Areas



Other roles identified by respondents for fraud prevention include:

1. Flagging for potential underwriting fraud; and
2. Flagging for an investigation into providers, such as an autobody shop or medical clinic.

Fraud has been shown to be a significant cost pressure for insurers, and therefore enhanced fraud prevention could be a source of premium relief. Fraud for insurers can come from a variety of sources, including the policyholder, medical professionals, and autobody shops. The usages above indicate insurers are attempting to prevent fraud from all three of these sources.

Marketing

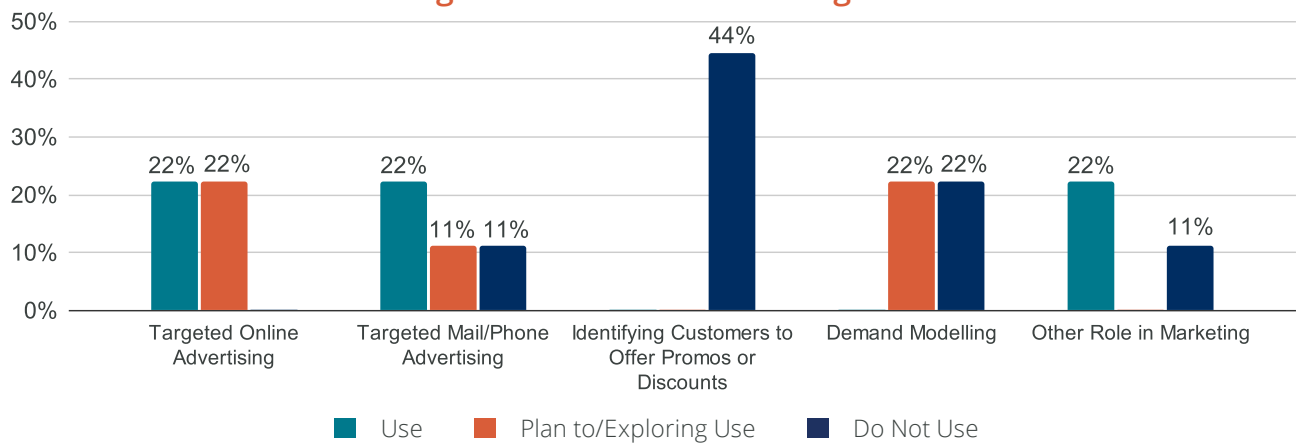
56%

Of Insurers Use or Plan to Use for Marketing

Only five of nine insurers who use AI/ML use it for marketing. We define the following usages in the marketing area:

1. **Targeted Online Advertising:** Determining who, where, and when to send online advertisements for higher efficiency.
2. **Targeted Mail/Phone Advertising:** Determining who, where, and when to send mail/phone advertisements for higher efficiency.
3. **Identifying Customers to Offer Promos:** Identifying customers who an insurer may offer a discount to in order to attain their business.
4. **Demand Modelling:** Utilizing consumer behavior to determine how customers behave in response to changes in the insurers premium.

Usage of Insurers Model in Marketing Areas



Other roles identified by respondents for marketing include:

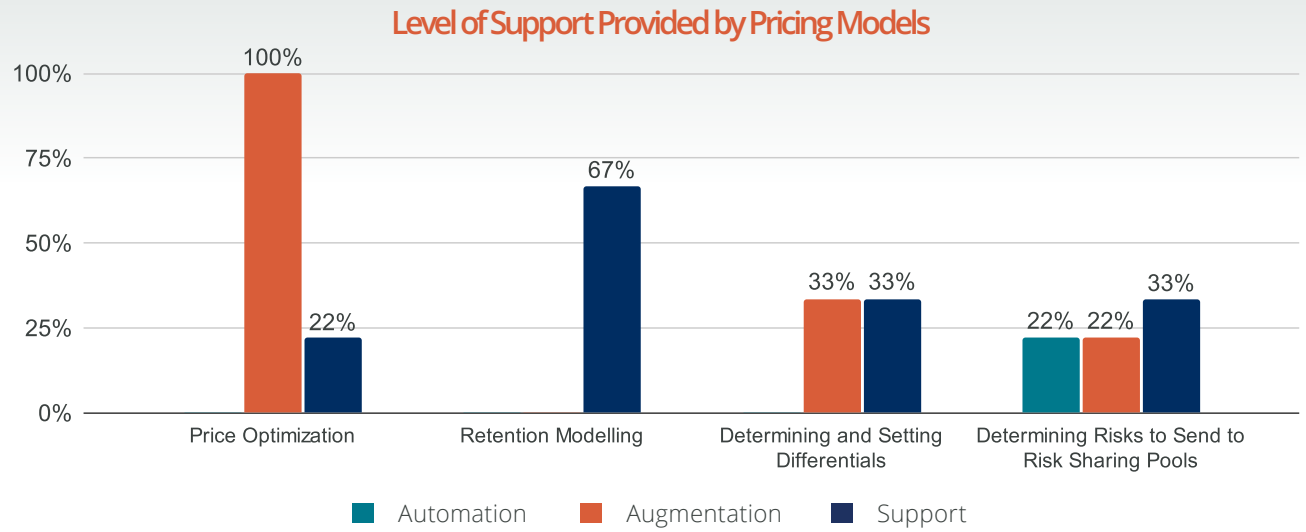
1. Marketing optimization, such as identifying effective TV time slots; and
2. Returns on marketing models.

Few models are currently in use, suggesting this is the least developed business area for advanced models. Generally, insurer groups having a direct writer are more likely to be using advanced models for marketing purposes.

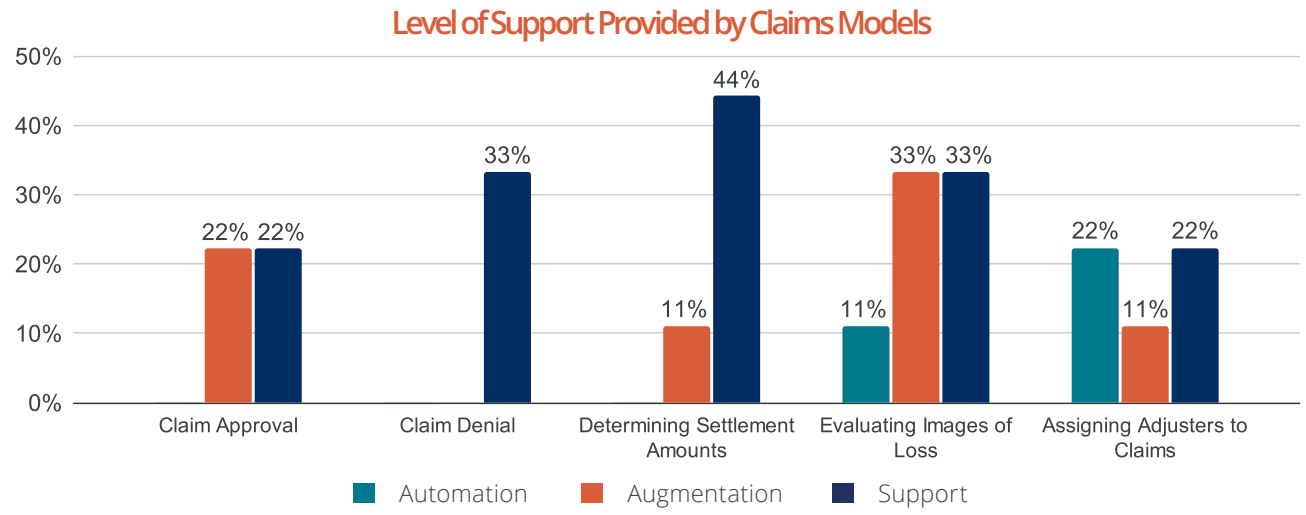
Level of Support Provide by Models

For each of the specified business areas and use cases, we then asked each insurer the **level of support** provided by these advanced models. We define the levels of support as:

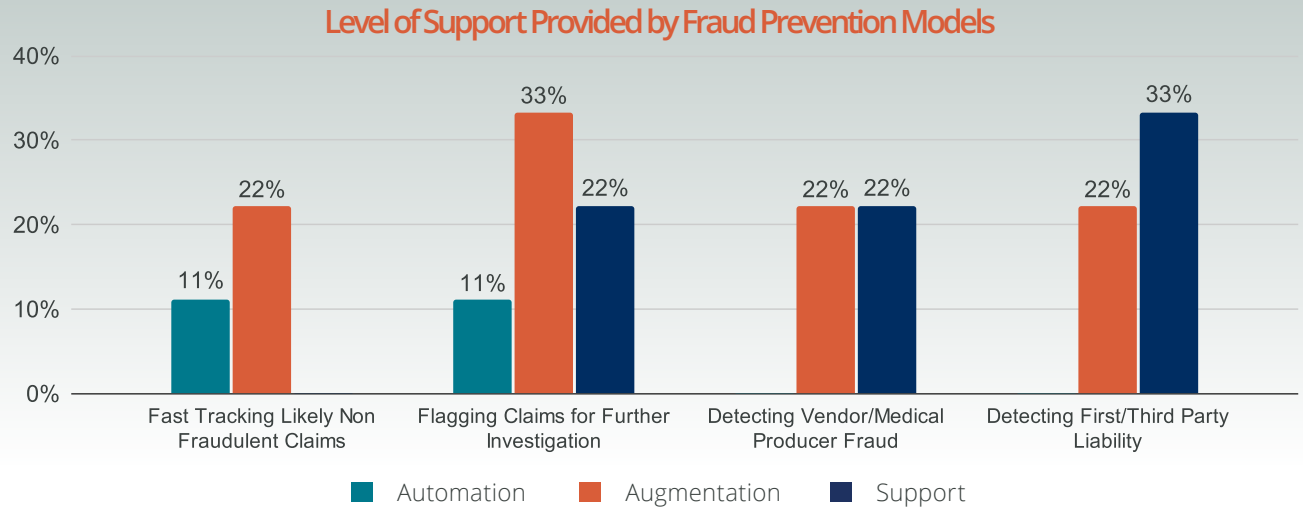
1. **Automation:** No human intervention on task execution.
2. **Augmentation:** Model suggests an action to an employee.
3. **Support:** Model presents information but does not suggest an action.



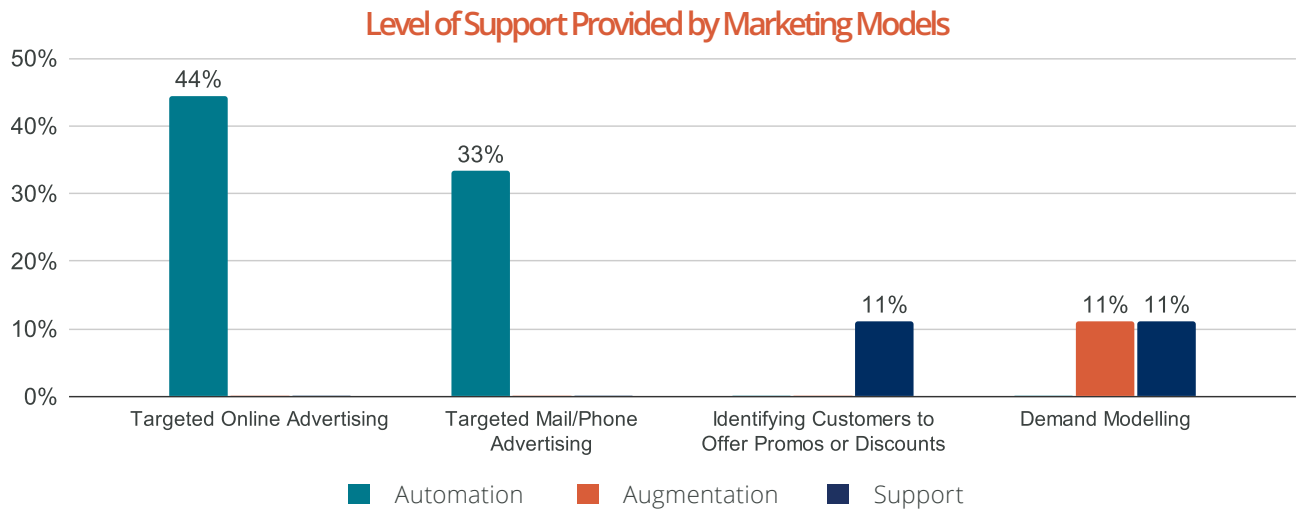
Models in use for pricing largely offer support or augmentation to employees, particularly in higher risk tasks, like determining differentials or retention modelling. For lower risk tasks like determining which risks to send to a risk sharing pool (something which does not impact a consumer at all), these may be automated.



Use cases are primarily used for process efficiency, such as evaluating images and assigning adjusters, are largely automated and allow insurers to reduce their expenses reviewing claims. Insurers can only deny a claim in very specific instances, so it is good to see models for this task only offer support.



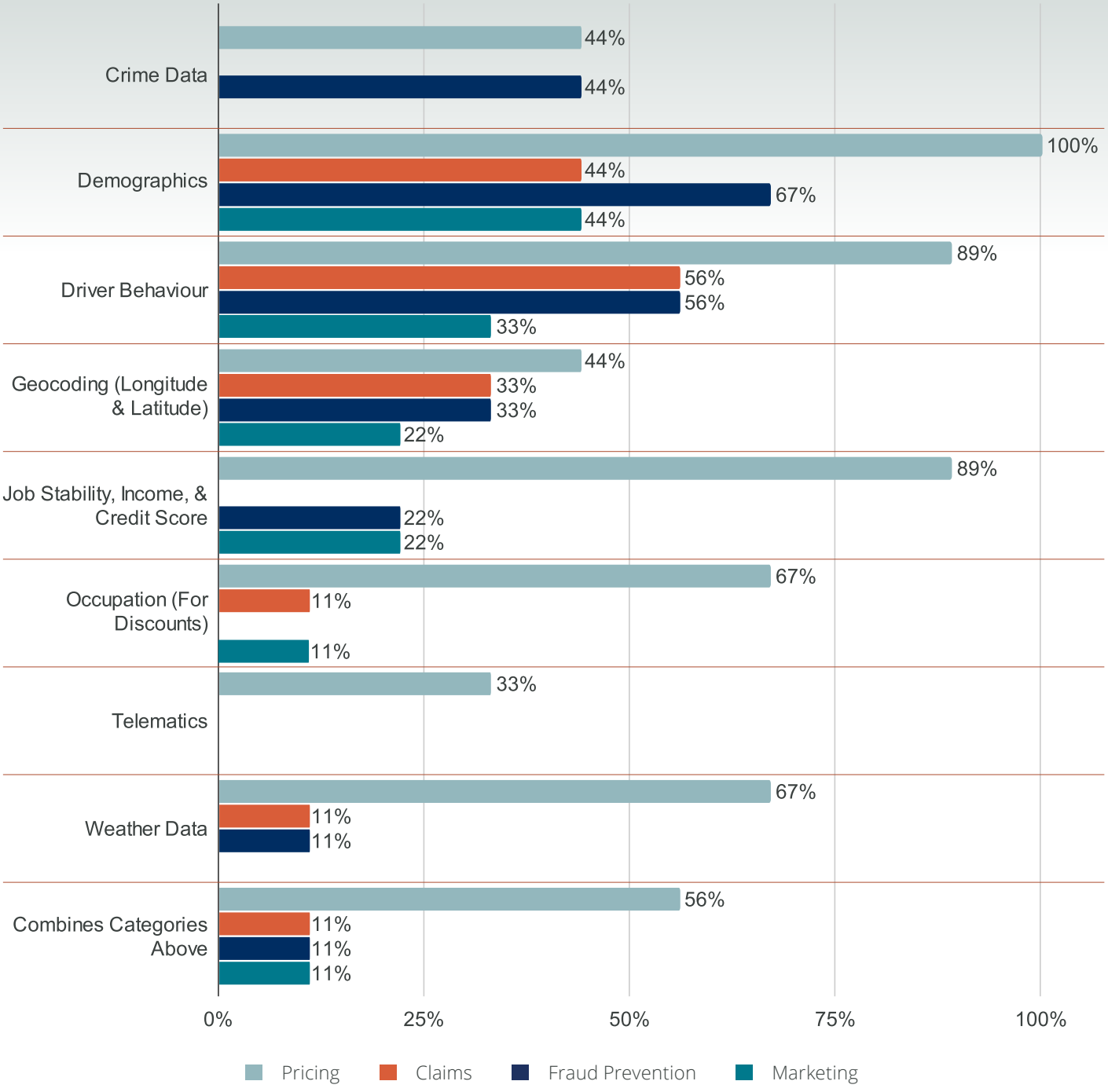
There are only two automated models for fraud prevention, and both are used to either speed up a claims processing, or slow it down, depending on the level of suspected fraud. These models are used by separate insurers. As fraud is a serious offence, it is good to see insurers are largely focused on augmentation and support models.



Marketing sees the highest amount of automated models, as it is the lowest risk area of the four. Advanced models with automated execution are likely to be much more efficiency marketing tools than earlier methods, and this allows an insurer to have a more efficient advertising budget.

Data Sources

The chart below represents the percentage of respondents who use a data source for a given business area. A response of 100% indicates this data source is used by all nine respondents use advanced models.



Other data sources identified by respondents include:

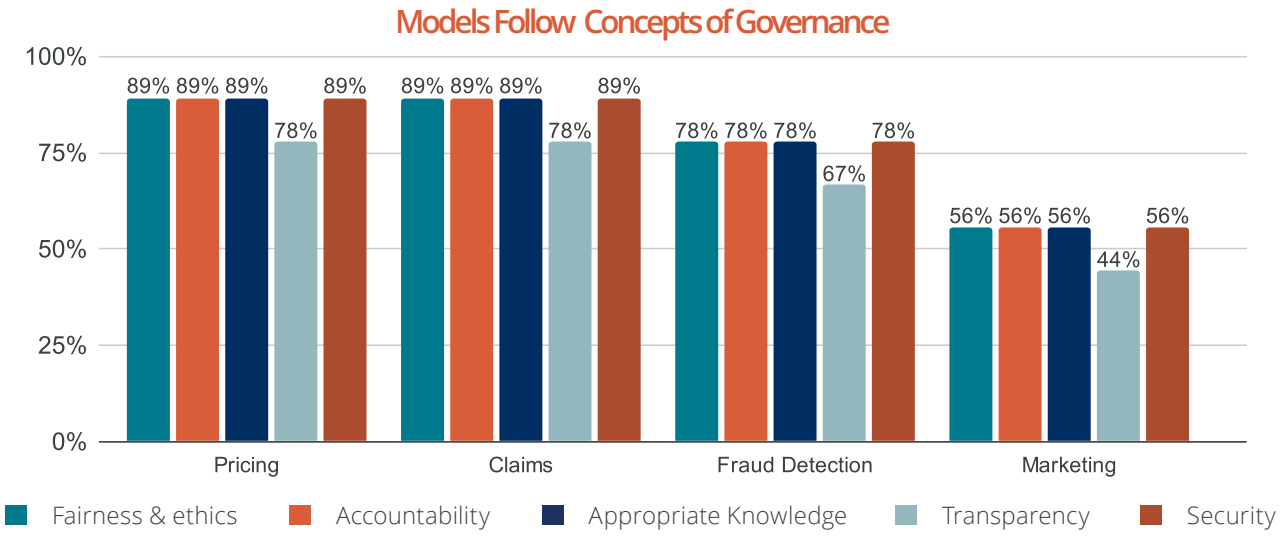
1. **For claims**
   - Vehicle damage details; and
   - Severity variables, such as ambulance use, injury description, etc.
2. **For fraud detection**
   - Claim information, such as type of loss, fault, injury, images, and others;
   - Information provided by vendors such as body shop or clinic; and
   - Coverage and vehicle details.
3. **For marketing**
   - Behavioral data, such as whether a potential customer accepted a quote.

Model Governance

This section dealt with the industry's knowledge and awareness of specific risks. We stated it is not enough to acknowledge these risks, there must be proactive procedures in place. We defined the following five principles:

1. **Fairness and Ethics:** Generally, respect the rules of law and implement solutions benefitting consumers while avoiding harmful or unintended consequences such as unfair or proxy discrimination.
2. **Accountability:** Ensure data used is delivering the intended benefit, and there are proactive plans to ensure there is no unacceptable or unintended impacts.
3. **Appropriate Knowledge:** Insurers have the required knowledge to ensure compliances with laws, including related to unfair discrimination, and are actively involved in these programs and decision making, including oversight of any third-party software used.
4. **Transparency:** Ensure processes are in place which address transparency, ensure adequate and complete consumer disclosure regarding the data being used, as well as providing consumers a way to appeal or update inaccurate information.
5. **Security:** Insurer has a program in place focusing on security in terms of data and/or intellectual property, from potential comprising interference or risk, and necessary privacy protections are in place.

We then asked each insurer whether the models used in the previous business areas meet these principles, or similar, standards.



There are a maximum of eight, as one insurer does not currently have models in use but has answered other sections as they are exploring the use. Another insurer indicated they follow all model governance concepts, except for transparency, which they indicate they do not follow in any business area. For fraud detection there is a maximum of seven, as one insurer did not fill out the governance section for these business areas. Finally there is a maximum for five for the marketing area as only five insurers use models for marketing.

We acknowledge it is unlikely insurers will have governance exactly as defined in our five principles, but it served as a starting point and many insurers provided great detail about their internal model governance in the survey. As well, staff had conversations directly with insurers about their governance approach and ways to improve the survey in future years.

Conclusion

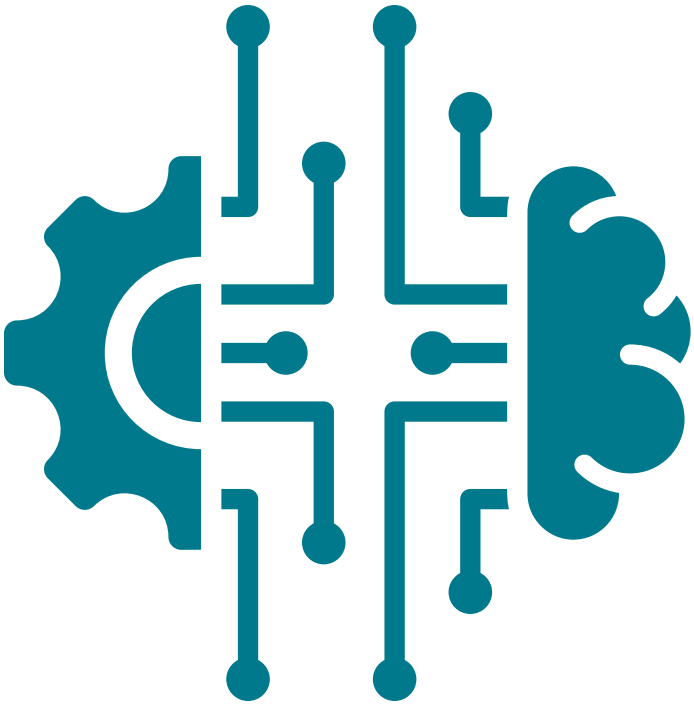
Not many years ago, auto insurance premiums could be easily calculated and clearly communicated to policyholders. This is not the case today, as we are seeing an increase in the adoption of advanced tools to price auto insurance policies, serve policyholders, and reduce costs. Given the advancements in these technologies, this survey was conducted to inform the AIRB how advanced models are used today and understand where insurers are looking to employ them in the future.

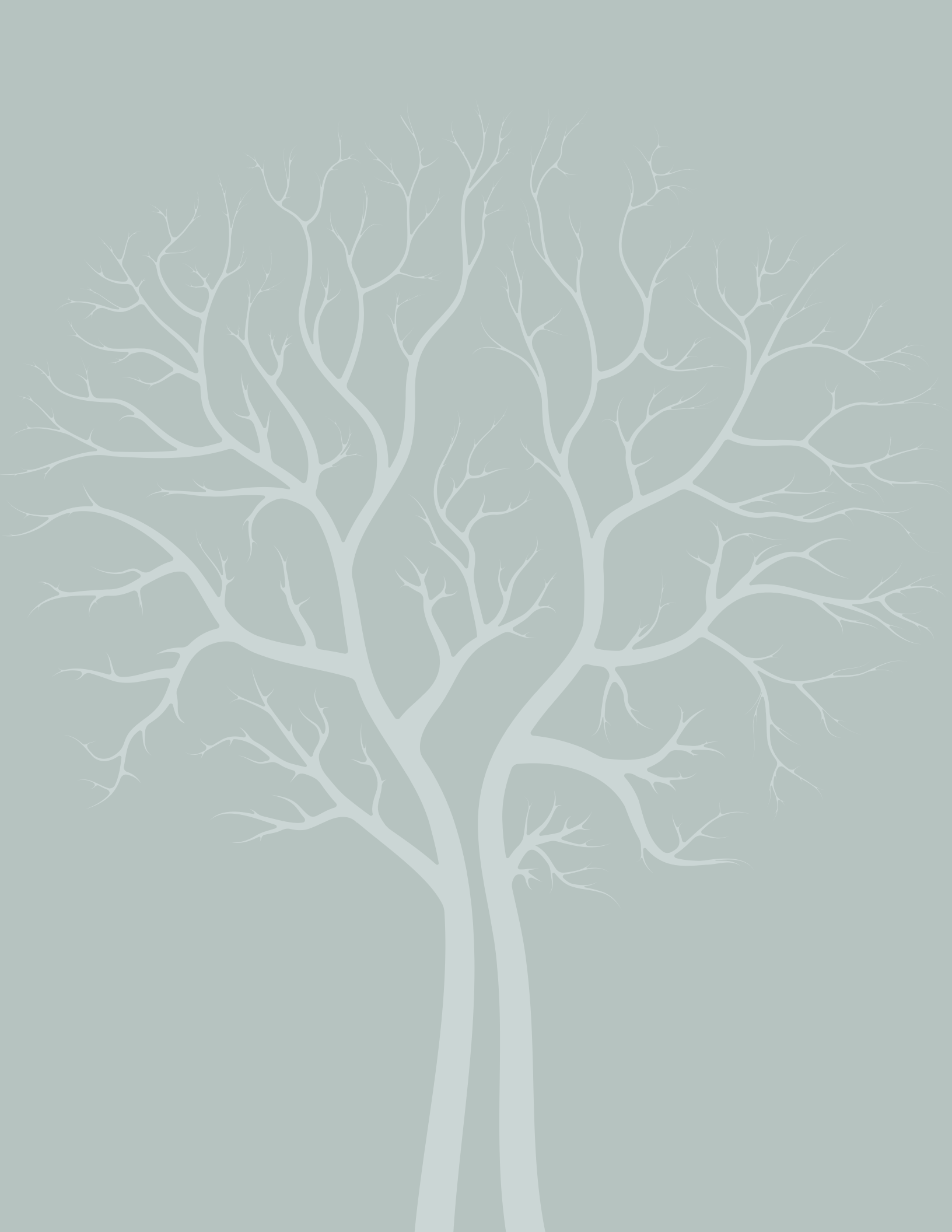
The intention of this survey was to start a conversation directly with the industry about how and where they are using these models, and if they have adequate governance over their use. Based on the results of this survey, we are satisfied the industry is cognizant of the risks associated with these models and are sufficiently proactive in their approach. However, we recognize our inability to verify if these responses are entirely accurate.

Industry is implementing models in several areas which may benefit consumers. Primarily, models used for fraud prevention and claims can help lower claim costs and reduce expenses, which in a competitive market, can be passed onto consumers by giving insurers the ability to price lower than competition.

While few insurers indicated an interest, we will be monitoring the concept of price optimization closely, as this moves away from actuarially justified rates to rates based on demand properties. This area seems to be a highly divided topic, with some insurers taking an ideological stance it is not appropriate. Currently, no such models are in use.

As a principles-based regulator, we do have any plans in the near term to implement any specific rules in this area. We will continue to conduct this survey periodically, using the same survey with only small tweaks, if any, in the future to ensure we can appropriately track industry's movement and will consider developing guidance if warranted in the future.





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