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Roosevelt has extensive experience in a wide range of disciplines, including the application of advanced statistical analytics techniques to insurance processes, as well as predictive analytics in rating and underwriting plan design, insurance price optimization, homeowners by-peril analysis, claims modeling and more. He has presented on topics relating to predictive analytics, ratemaking, credit, class plans, and the actuarial career, and has assisted over 40 companies in applying predictive analytics to auto and homeowners rating, underwriting and product development. Roosevelt is based in the Bloomington, IL, office.

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Beyond Price Optimization: Effectively Measuring Customer Value

In recent years, price optimization strategies have received considerable attention throughout the insurance industry. With the advent of sophisticated predictive analytics techniques, some companies are moving away from the traditional "cost-plus-profit" approach in an effort to effectively integrate a greater demand-side component to their pricing models. Today, with a wealth of additional information and analysis techniques available to firms, a much greater sense of true customer value can be identified. As a result, insurers are gearing up to incorporate price optimization in their strategic plans.

Yet for even the most innovative companies, implementing a viable price optimization strategy can be fraught with challenges. For example, simply identifying whether profit or growth should to be optimized can be tricky. In cases where the optimal price is more than the market can bear, critical decisions affecting the entire book of business must be made. Equally important, where price changes are driven by optimization strategies, it's vital to recognize how all areas of the firm could be affected by any given set of decisions.

For insurers in particular, these and other crucial questions must be addressed whenever considering a price optimization strategy. However, while the focus of price optimization is, by definition, on price, retaining a focus solely in this area can unnecessarily narrow the lens for an insurance firm by excluding a number of inputs to the process and potential applications for results. Instead, insurers are best served by moving beyond price alone to optimizing customer value by drilling down to understand what drives value within certain segments and by developing targeted plans to address these segments.

A Matter of Perspective

Historically, insurance companies have defined a valuable customer in different ways. One way is by identifying customers who represent a lower likelihood of having a claim. In auto insurance, for example, this has traditionally been thought of as middle-aged insureds with multiple cars, who buy multiple lines of insurance from the same company, have a good claims history and a good credit based insurance score.

> "...focusing on price unnecessarily narrows the lens...."

Another approach is to define valuable customers as those who fall within a particular niche, such as auto club members, teachers or farmers. A third definition focuses on segments a company believes are already priced adequately. If the company can charge a premium that it feels is adequate for the risk being undertaken, the expected profitability and therefore the value of the risk increases.

Drawbacks exist with these definitions of a valuable customer. While any one definition may capture some elements of value, none of them are complete in and of themselves. With other forces at work, focusing on only one aspect of value can lead to a false perception of value for certain types of customers. For example, if a group of customers has a low likelihood of having a claim, it does not necessarily make them more valuable risks. After all, many companies may be competing for these low frequency risks, which can impact profitability. Further, niche and segment definitions can be subjective, based on institutionally held beliefs or the beliefs of certain key executives in the company. Valuable customer definitions can also vary within different areas of the same company.

Together, these realities can lead to siloing, in which each area of a company focuses on what is important to them. For insurers, this can be especially difficult to overcome. Within marketing, this value may be measured by the close rate, while the actuarial department may tie value to pricing adequacy. To the extent that these definitions may conflict, inconsistent or inappropriate decisions can be made regarding price, and the promise of a price optimization strategy can be undermined.

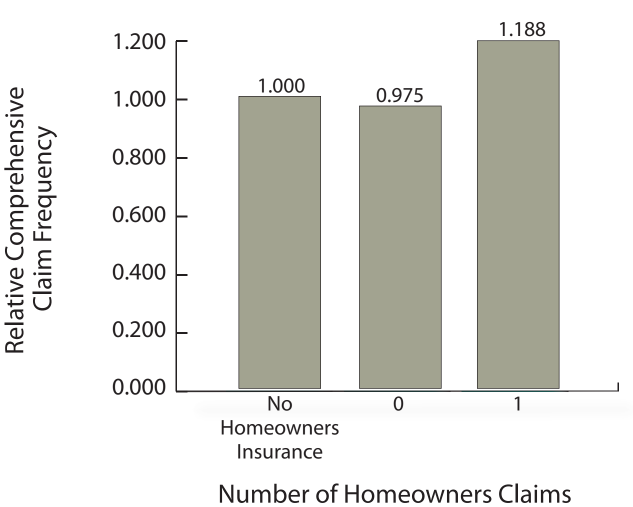
Beyond a Focus on Price

A true definition of customer value is one that takes into account all of the necessary elements and is consistent across the organization. Broadly defined, an effective value definition incorporates two key elements:

- Expected profit, which incorporates anticipated premium, losses and expenses.
- The likelihood of making a profit over the time period being analyzed, including marketing response, close rate, and policyholder retention.

The first element in understanding customer value is the expected claim cost associated with a particular insured. Many insurers have begun using more sophisticated statistical techniques such as Generalized Linear Modeling (GLM) applied to a series of risk characteristics to determine how they affect insurance premiums. While this type of analysis is a significant step forward, there are enhancements that can be made to further refine an expected loss estimate. Companies can use permissible risk factors significant to

Figure 1 - Comprehensive Frequency by Additional Line Claim Experience



understanding loss even if not traditionally used in a rating plan. Company data from other sources can be incorporated, such as underwriting, agency, billing and account information. Also, more advanced statistical analysis techniques can be applied.

Figure 1 demonstrates the difference in auto insurance comprehensive frequency experience based on the number of claims filed in the last five years for other lines of insurance purchased with a company. Figure 1 is an example of the use of factors beyond those considered solely in the rating plan. Here, prior homeowners claims were predictive of higher loss potential for auto insurance. While this might be a factor difficult to use in a rating plan, it can easily be incorporated in an estimate of a customer's expected claim cost.

Underwriting and claims expenses can be incorporated into the value calculation a number of different ways. One simple approach is to apply a constant percentage or dollar amount to each premium as an expense load. However, differences in expenses associated with different types of insureds can exist, and these differences should be incorporated into the determination of customer value. One example is general claim expenses, which are not assigned to specific claims and are generally applied proportionately across the entire book of business. However, an approach could be implemented that allocates more of the general claim expense load to customers with a higher likelihood of filing a claim.

Once expected claim costs and expenses are calculated, an expected profit of a given risk can be determined by subtracting claim costs and expenses from the premium. While, in theory, premiums are set so that each insured pays a price that reflects a certain level of risk, in practice disconnects exist between the premium and expected claim costs.

Figure 2 shows a distribution of expected profitability, with a significant left tail to the distribution showing that the expected losses of a smaller percentage of insureds are being supported by those with an expected profit.

Given a significant variation in the expected profit between risks, insurers can benefit from understanding the characteristics of risks with higher or lower than expected profitability.

The Value of Deeper Analytics

With the advent of advanced statistical modeling techniques, insurers can advance customer value strategies by integrating various characteristics that differentiate their customers into risk segments. By utilizing predictive analytics that incorporate customer attributes into expected loss, marketing response, close rate, retention and competitive models, insurers have the tools they need to develop a greater, more in-depth understanding of customer value.

Customer Response

Throughout the entire insurance process, a current or potential customer has multiple opportunities to accept or reject a company as an insurer. The likelihood of a potential customer obtaining a quote from an insurer involves being persuaded to respond to a marketing effort, and then being convinced to obtain a price quote. By quantifying customer response, an insurer can adjust the expected profit by the likelihood of actually realizing that profit.

Marketing Response

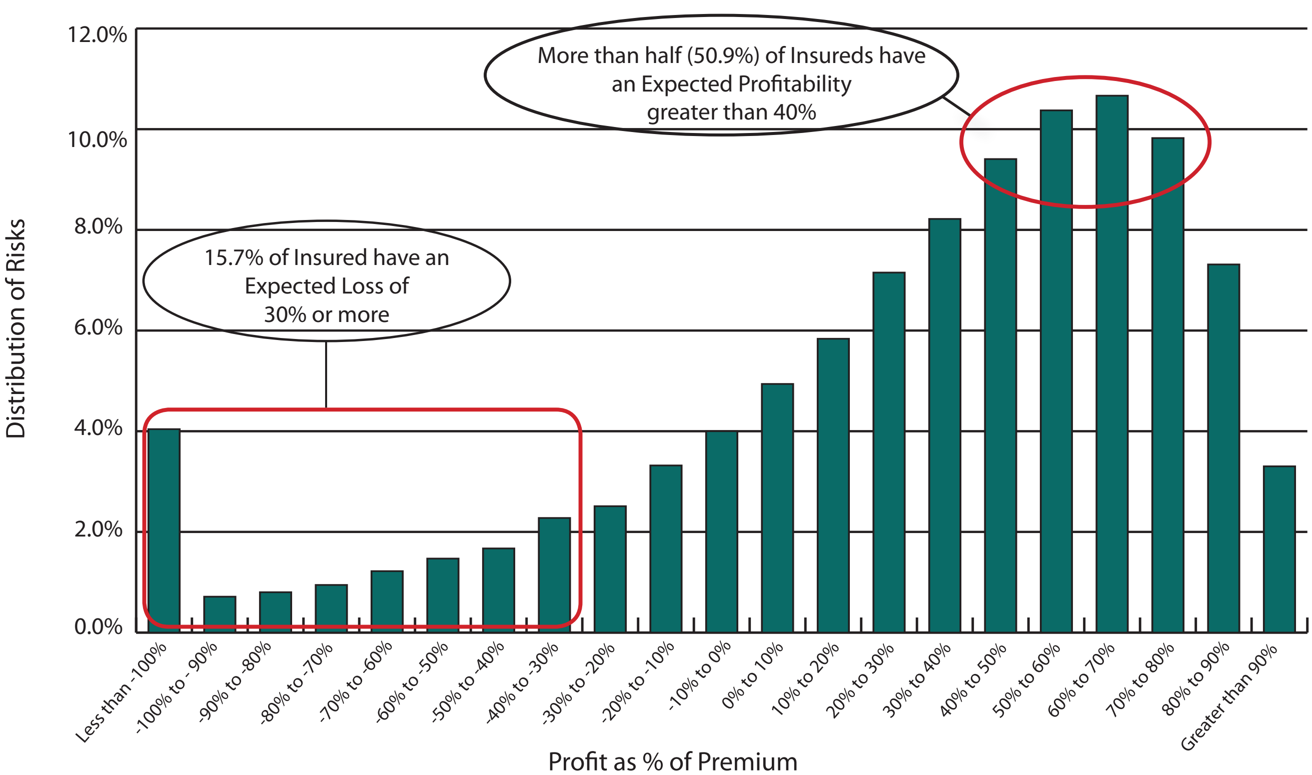
A marketing response analysis can help determine the likelihood of a potential customer obtaining a quote. However, this can be a difficult analysis to perform, as the target population can be large and difficult to define and the response to marketing efforts difficult to track. In addition, defining detailed characteristics for the target population can prove challenging, even with available sources of detail such as marketing lists, affiliated company data and internal sources. Despite the difficulties, the results of this analysis can be very valuable in making more effective use of marketing dollars.

Close Rate and Retention

For close rate or conversion studies, the likelihood of an insured purchasing a policy once a quote is received takes center stage. A retention analysis is the study of the likelihood of a current insured renewing, and incorporates a number of elements such as traditional rating factors, account characteristics (e.g., number of policies, number of years insured) and market conditions (e.g., competitive position, hard or soft market, brand value).

The likelihood of a risk to convert is influenced by an insurer's pricing structure and marketing targets. In the example shown in Figure 3, an insurance company attempting to write more policyholders with college degrees implemented a rating plan that provided significant discounts to those with college degrees. As shown, the likelihood of insuring risks with higher levels of education was higher, so the plan was a success. However, this is also an example of competing definitions of value. While this close rate was good from a marketing perspective, the discounts were not actuarially justified, so ultimately the profitability suffered.

Figure 2 - Distribution of Expected Profitability



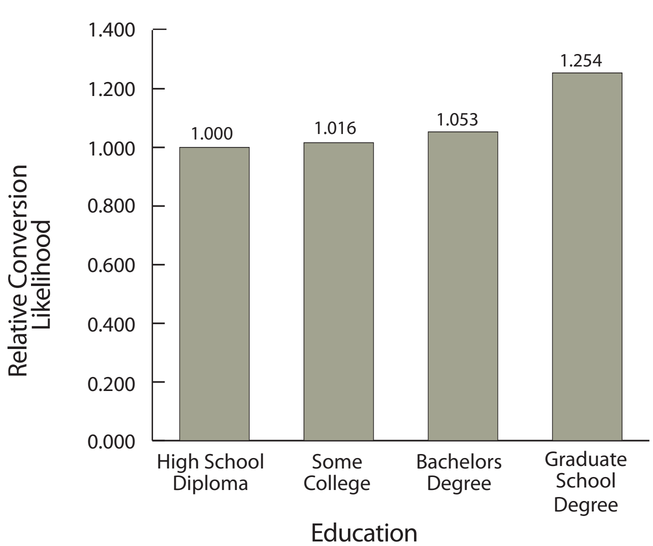
A close rate analysis is used to better identify the risks that the company has been good at attracting, and can also be used to identify where a company has problems competitively. A retention analysis helps to identify risks that are more likely to leave a company, and could also potentially point to either competitive issues or customers that are more sensitive to negative experiences with a company. In either case, insureds that are less likely to convert or renew can be proactively addressed to improve conversion and retention rates, and those more likely to convert or renew can be targeted and protected. Ultimately, analyses such as these can help develop a predicted close and/or retention rate based on the characteristics of a risk. These predictions can then be used to assist in determining the likelihood that the expected customer profit will be achieved over a certain time period.

Competition

The competitive position of a company also influences the ability to attract and retain insureds at a set price. However, competitive position depends on more than price alone, and includes other factors such as marketing activity and brand value. While premium differences between insurance companies are an important part of this equation, it is becoming more difficult to determine the premiums that other companies are charging as a result of tiers, insurance score and other variables difficult to decipher.

Nevertheless, various approaches can be taken to understand the impact of competition. One such approach is the analysis of batch quotes. Competitive quotes can be generated on an insurer's entire book of business, or they can be generated on a market basket of risks diverse enough for results to be mapped back to individual policyholders. Another approach is the use of segmented market share, such as the level of penetration for auto and homeowners insurance markets at a more detailed, granular level, such as geographic region, make/model, model year, age, and marital status.

Figure 3 - Likelihood of Conversion



For homeowners, this could include geographic region, amount of insurance, and construction type.

While this detailed market penetration may not get down to an individual risk level, minimal penetration in certain segments can alert an insurer to competitive issues. A final approach is simply to rely on the customer response analyses to alert you to potential competitive issues. While this may not detail what competitive issues exist, it could prompt more investigation to uncover the root cause.

Sensitivity to Price

Price changes also have an impact on expected customer value. As premiums change, expected profits change as well—but so, too, does the likelihood of customer conversion and retention. In theory, as prices increase, expected profit will rise but expected conversion and retention will decrease. Conversely, as prices drop, expected profit will decline but expected conversion and retention will go up. The rate of change of expected retention and conversions will ultimately determine the impact of price changes on expected customer value.

Measuring the impact of price changes on expected customer retention and conversion is often problematic for personal lines property and casualty insurers. Companies rarely have a complete history of customer reaction to price changes because they are only allowed to change prices once or twice a year. Further, premium changes can be due to changes in risk characteristics (such as adding a teenager to an auto policy). To the extent the customer anticipates premium changes, there may be no impact on retention of conversion. Lastly, for new business, the insurer often does not have the previous premiums available.

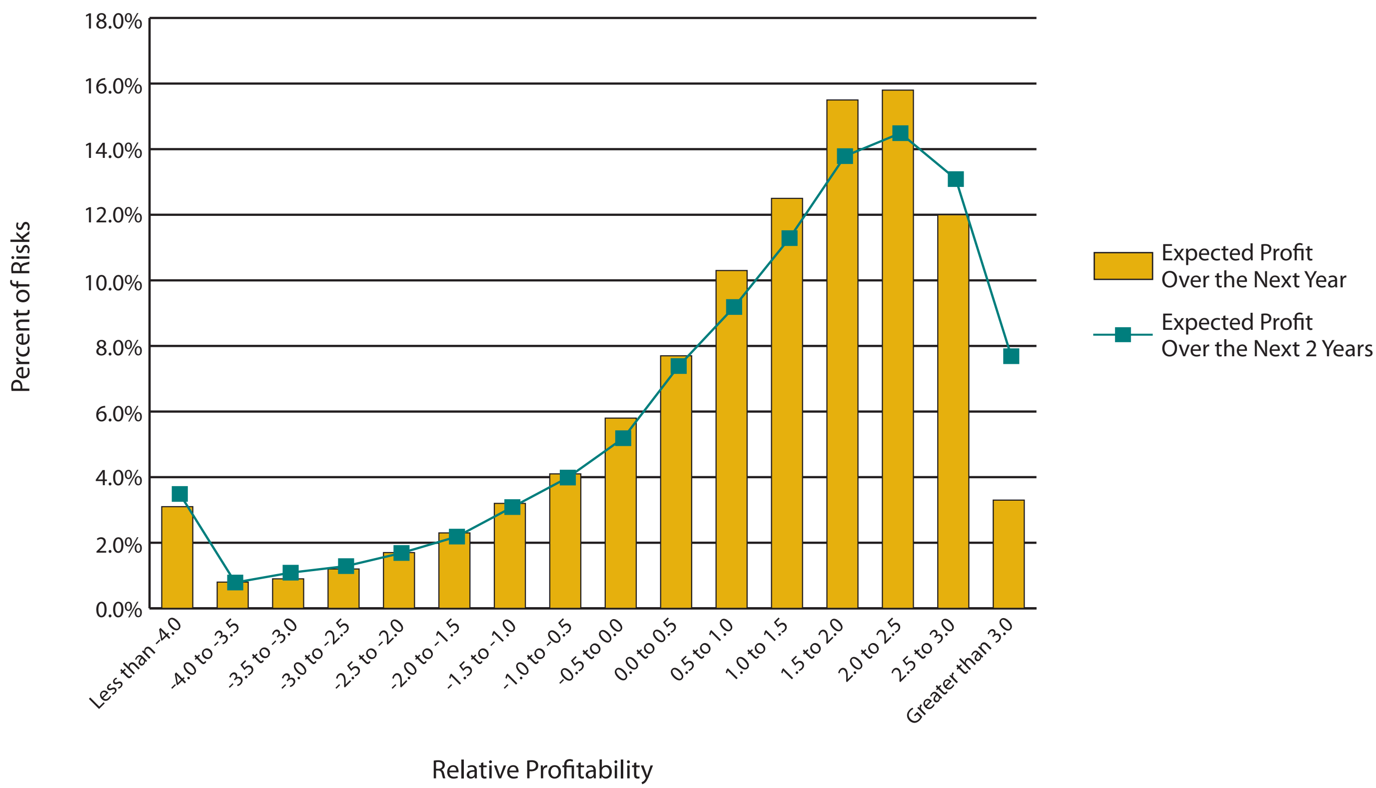
While these challenges are significant, they are not insurmountable. The starting point is for the company to analyze the price change history it does have, determine its impact on retention and conversion and use this analysis along with additional information to develop an estimate of customer price sensitivity.

A Road Map to Greater Profitability

When all the elements of customer value are combined, the results can be surprising. Figure 4 shows an example of the relative expected profitability of a book of business over two future years compared to the expected current year profitability. This analysis takes into account not just the relationship of premium and loss, but also the likelihood that risk will be retained over the two year period.

Several items are apparent from Figure 4. First, there is a significant spread in the expected profit by risk. In this particular example, there are individual insureds with calculated expected losses more than 10 times greater than the premium being charged. As can also be seen, almost 3.5% of the insureds that had an expected profit of over three times the average profitability. In addition, a significant left tail to this distribution, with 25% of the insureds being

Figure 4 - Expected Value of Existing Business



below the break-even point, exists. Finally, the mode of this distribution is 2.0 – 2.5 times the average profitability, reinforcing the fact that there are a significant number of customers whose higher than average expected profits help offset the losses of a smaller number of customers with significantly higher than average expected losses.

For many of the risks, the direction of the profitability does not change from year to year, so the likelihood of renewal makes the tails of the distribution more extreme. As a result, the tails of the expected value over the next two years begin to shift outward. The exception to this is when there are significant changes in risk characteristics, which can be predicted by the use of analytics as well.

An Application for Greater Value

Once this value has been determined, a "customer value score" can be developed to assist in understanding the characteristics of insureds with higher and lower than average expected long-term customer value. This score can then be applied in a variety of ways, including:

- Underwriting: As part of the underwriting process, an expected customer value can be incorporated to help focus efforts on improving customer value. This value can provide a mechanism for automated underwriting, thus freeing the underwriter to spend more time with the more challenging risks.
- Actuarial: The use of a customer value score by the actuarial department in determining prices will assist in balancing short term interests with long term profitability and stability. The true long-term impacts of increasing or decreasing rates can then be better understood in terms of change in overall expected customer value.
- Marketing: By incorporating the expected customer value score in the determination of the target market profile, a firm can focus not just on customers likely to be attracted to and purchase insurance from the company, but also whether these potential insureds are likely to be profitable customers in the future.
- Product Managers: The use of expected customer value is another tool that allows product managers to measure overall performance and estimate how various choices could impact expected value.

Once a company better understands the value of a customer, the question becomes how to leverage this information to target specific customer segments. If the issue is higher than expected losses, for example, steps such as re-underwriting, re-inspection and implementing loss mitigation efforts can be explored. If the lower than expected value is due to lower than average retention, proactive steps can be taken to provide the customer with incentives other than price to stay. Focusing on customer value allows for action to be taken by the entire organization, not just within the realm of pricing.

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Conclusion

A Better Focus for the Future

Historically, insurance companies have defined customer value in qualitative terms, and most quantitative definitions of value have occurred primarily at an aggregated level and with a near-term focus. In addition, definitions of customer value have varied within a company.

Yet, with all of the additional information and the additional analytic techniques available to insurers today, the elements of true customer value are beginning to come into stronger focus. When elements are used to develop a true customer value measure, such efforts can lead to the development of a more valuable long-term book of business and more organizational consistency in measuring value.

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