



April 15, 2015

Via email to Kris DeFrain ([kdefrain@naic.org](mailto:kdefrain@naic.org)) and Tiffany Fosgate ([fosgate@naic.org](mailto:fosgate@naic.org))

Richard Piazza  
Chair, Casualty Actuarial and Statistical (C) Task Force

c/o Kris DeFrain, Director, Research and Actuarial Department  
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RE: Casualty Actuarial and Statistical (C) Task Force Request for Information

Dear Mr. Piazza:

Thank you for the opportunity to provide comments on the Casualty Actuarial and Statistical Task Force (CASTF) draft Price Optimization White Paper. The American Academy of Actuaries<sup>1</sup> Casualty Practice Council (CPC) recently formed the Price Optimization Task Force to address price optimization issues. The task force has reviewed the document and offers the comments below.

The draft paper is well structured to address key issues associated with price optimization techniques and regulatory considerations. Recognizing this is the first draft, we have a number of comments for your consideration, which we address by paragraph number below (recommended modifications are indicated by *italics*).

1. **Suggested edits:** We suggest changing the fourth sentence as follows:

“However, the advent of sophisticated data mining tools and *modeling techniques has* allowed actuaries *and other insurance professionals* to provide ...”

6. **Suggested edits:** We recommend some edits as well as additional commentary in this paragraph as follows:

“Price optimization is a sophisticated *technique* based on predictive modeling *results and business objectives and constraints that are* intended to assist insurance companies in setting

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<sup>1</sup> The American Academy of Actuaries is an 18,500+ member professional association whose mission is to serve the public and the U.S. actuarial profession. The Academy assists public policymakers on all levels by providing leadership, objective expertise, and actuarial advice on risk and financial security issues. The Academy also sets qualification, practice, and professionalism standards for actuaries in the United States.

prices. It is an additional component of the pricing process in which the business manager goes from *cost-based* rates to final prices by *integrating expected costs with expected consumer demand behavior, subject to target business objective(s). The target business objective(s) may be to improve profit, increase volume, increase or maintain retention, or some combination thereof. These targeted business objectives represent the insurer's pricing strategy. Price optimization is a technique used to achieve that pricing strategy.* According to Earnix, price optimization utilizes a variety of applied mathematical techniques (linear, non-linear, integer programming) in the ratemaking process to analyze more granular data.”

(The final sentence regarding Earnix could be separated into its own paragraph, similar to paragraph 7, which addresses Towers Watson’s definition.)

7. **Comment:** For each of the three types of optimization listed, cost and demand (as well as marketing goals and competitor rate levels) are considered. The distinguishing feature for each type is the output, specifically, what is allowed to change. To make this clear, we suggest deleting the first sentence of paragraph 7 (“~~There are several different types of price optimization, and price optimization can be modeled at different levels.~~”) and revising paragraphs 8-9 as noted below.
8. **Suggested edits:** “With ‘rate book optimization’ *the rate relativities are optimized within an existing (fixed) rating structure. Here, the output would be a set of rate relativity indications that consider cost, marketing goals, and competitor prices, consistent with the insurer’s pricing strategy.*”
9. **Suggested edits:** “With ‘individual price optimization’ *the output is an individualized premium that considers costs, marketing goals, and competitor prices. This type of price optimization is believed to be more common with retail or personal service companies in the U.S. It is used for insurance pricing in other countries with different rating laws, such as in the U.K., where individuals with identical risk characteristics can be offered different premiums on different days due to demand or market changes.*”
11. **Comment:** Here, we suggest a fuller treatment of constraints, including that constraints can be at the individual risk level or at the portfolio level. For example, a portfolio-level constraint might be to optimize prices subject to the constraint that no insured sees a price change of more than +/- 15 percent. An individual risk-level constraint might be similar to the situation described whereby the rate relativities are constrained to fall between the bounds of the current relativity and cost-based indicated relativity. It may also be helpful to note that “constrained” or “unconstrained” are variations on the three types of optimization described in paragraphs 8-10. For example, rate book optimization can be conducted either constrained or unconstrained.
14. **Suggested edits:** We suggest changing the first sentence as follows:

“Vendors (such as Towers Watson and Earnix) *have developed commercially available software for carriers who perform price optimization.*”

15. **Comment and suggested edits:** We have three comments on this paragraph. The first two comments are relatively minor. You may wish to add “*to rates*” after “*adjustments*” in the first sentence to clarify what management may adjust. The second comment is to expand who makes the adjustment to include both management and actuaries. Consistent with our comment on paragraph 1, we suggest changing “*management*” to “*management, with the input of actuaries and other insurance professionals* may make adjustments...” The third comment is regarding the table. For the bottom rightmost box, the adjustment to the rates under the price optimization approach is still based on market, regulatory, and other considerations. The distinction in the traditional approach and price optimization approach is a qualitative versus quantitative distinction (which is noted in paragraph 16.) We suggest an alternate table as follows:

	<i>Traditional Approach</i>	<i>Price Optimization Approach</i>
<i>General Approach is...</i>	<i>Base rate (loss cost) x selected adjustment factor</i>	<i>Base rate (loss cost) x selected adjustment factor</i>
<i>Indicated cost-based adjustments (for auto insurance) are based on a review of costs by allowable rating characteristics...</i>	<i>Age, gender, territory, make and model year and many other rating variables.</i>	<i>Age, gender, territory, make and model year and many other rating variables.</i>
<i>Selected adjustments to rates are based on...</i>	<i>Competition, demand, marketing objectives, regulatory and other considerations (<b>qualitative assessment</b>)</i>	<i>Competition, demand, marketing objectives, regulatory and other considerations (<b>quantitative assessment</b>)</i>

16. **Comment and suggested edits:** We have several comments on this paragraph. An insurer can develop models for renewal, conversion, and/or competitive position without engaging in price optimization. As noted in paragraph 19, optimization is the process of systematically combining the various models. Thus, price optimization is not necessary to more accurately quantify the effects of rate changes (one can arrive at a more accurate quantification with a renewal model without the price optimization step). Similarly, the effect of deviating from loss costs on business metrics does not require price optimization. Finally, we suggest a change to the penultimate sentence. As written, the sentence could be read that both the traditional approach and the price optimization approach allow insurers to adjust filed and approved rating factors and relativities. Charging something other than what is filed and approved is only allowed subject to a state’s rate filing law (e.g., use-and-file states might allow a window of time whereby an insurer could adjust previously filed rating factors and relativities).

As an alternate paragraph 16, we propose the following:

“Price optimization is based on quantitative modeling and *provides indicated deviations from traditional cost-based ratemaking indications*. It adds an additional quantitative layer to the insurance ratemaking process by *integrating models such as those for new business conversion or policyholder retention with cost-based models to establish prices that achieve*

*a stated objective. Both the traditional approach and the price optimization approach make adjustments to cost-based indicated rating relativities. With price optimization these adjustments are made with more clearly quantified goals in mind. Estimated losses and expenses remain the foundation of the cost-based rate-setting process.”*

18. **Comment and suggested edits:** As noted in paragraph 19, demand models are inputs into the price optimization process. Thus the analysis of policyholder demand behavior occurs before the price optimization process. We suggest the replacement of the existing first sentence with the following:

~~“One of the most controversial ways that insurers are using price optimization is to analyze patterns of policyholder demand behavior.”~~ “*Incorporating policyholder demand behavior in establishing prices is a controversial aspect of price optimization.”*

19. **Comment:** The graphic depicts individual price optimization (in the rightmost column). As noted in the comments to paragraph 31, below, this is not a U.S. technique for pricing personal lines insurance. We suggest changing the graphic to address rate book or hybrid optimization, or removing the graphic.
21. **Comment and suggested edits:** The challenge of reviewing the effect of selections versus indications exists because risk classification plans have become and continue to be increasingly complex. In other words, the increasing challenge is independent of price optimization. We propose a revision to the paragraph to reflect this, placing the challenge at the beginning of the paragraph.

*“Distilling the voluminous information connected with more complex risk classification plans makes it difficult for regulators to determine the effect of deviating from indicated relativities. While this challenge exists independent of price optimization, it does increase the time and effort associated with reviewing rate filings. General guidelines some regulators are using include the relationship between the current, indicated, and selected factors, how far the selected factors vary from the indications, or the relationship between factors for a class plan variable.”*

- 27–30. **Comment:** As these paragraphs describe regulatory responses, we suggest that these would be better placed in Section IV, perhaps immediately following paragraph 35.

31. **Comment:** A number of the criticisms of price optimization techniques are specific to the implementation of such techniques outside of the U.S., specifically the use of individual price optimization. As noted above, drivers in the U.K. with identical risk characteristics can be offered different premiums on different days based entirely on consumer behavior and market considerations. For personal lines, we are not aware of any state that would allow such a practice.

34. **Comment:** We have some initial ideas that may be helpful as part of a regulatory review of rate classification plans. The general guidelines described in paragraph 21 are a good way to inspect the results and to understand the reasons (be they qualitative or quantitative) for an

insurer's selected rating factors and rating relativities. In addition, showing a distribution of the overall rate change, overlaid with historical loss ratios, is a useful way to ensure that policyholders with high (or low) loss ratios are in fact receiving rate increases (or decreases). It also allows the regulator to see the impact of the proposed rate change.

Our task force will continue to consider appropriate "best practices/principles," techniques, or methods that may be of help in shaping a regulatory response to the utilization of price optimization in developing rating schemes.

37. **Comment:** Item 2 refers to specificity of the "indication." That term is generally interpreted to mean the cost-based indication, and we do not think further specificity is warranted there. We suggest replacing "indication" with "*selected set of prices (i.e., those to which a deviation from cost-based pricing has been applied).*"

Item 2 also notes a certification process as one way regulators could supplement the review process. If this approach is pursued, we suggest that the essential elements of a rate filing opinion can follow those in the current NAIC Annual Statement Instructions governing the provision of Loss Reserve Opinions, stating that a) a "Qualified Actuary" is defined as "a person who meets the basic education, experience and continuing education requirements of the Specific Qualification Standard for Statements of Actuarial Opinion, NAIC Property and Casualty Annual Statement, as set forth in the Qualification Standards for Actuaries Issuing Statements of Actuarial Opinion in the United States, promulgated by the American Academy of Actuaries, and is either 1) A member in good standing of the Casualty Actuarial Society, or 2) A member in good standing of the American Academy of Actuaries who has been approved as qualified for signing casualty loss reserve opinions by the Casualty Practice Council of the American Academy of Actuaries"; b) that the rate filing opinion "Meet(s) the requirements of the insurance laws of (state of domicile)"; and c) that the rates "are computed in accordance with accepted actuarial standards and principles."

The steps described in item 3 could be added to paragraph 34 as "best practices." These steps could apply regardless of whether 1) price optimization was employed to arrive at the selected rate relativities, 2) competitive information was used to select relativities, or 3) marketing goals and judgment were used to select relativities.

An additional regulatory action could be to increase the level and means by which rate information is available to consumers. Many states have rate comparison or premium surveys that can be used to assist consumers shopping for insurance. Alternatively (or in addition), regulators could require specific rating examples as part of a publicly available rate filing document.

The task force appreciates this opportunity to provide comments to the CASTF. We hope these observations are helpful, and we welcome further discussion. We stand ready to provide input on future drafts of the CASTF white paper. If you have any questions about our comments, please contact Lauren Pachman, the Academy's casualty policy analyst, at [pachman@actuary.org](mailto:pachman@actuary.org) or (202) 223-8196.

Sincerely,

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