



Consumer Federation of America

To: Joseph Murphy, Chair
Auto Insurance (C/D) Study Group
c/o Aaron Brandenburg, NAIC
(Via email to ABrandenburg@naic.org)

Re: Towers-Watson Presentation Regarding Price Optimization

Dear Commissioner Murphy and Members of the Study Group:

Thank you for allowing us to submit comments and questions related to the Towers-Watson presentation of July 28, 2014 before the Study Group.

This letter first presents our comments on the presentation followed by questions we request that you ask of Towers-Watson.

CFA COMMENTS ON THE TOWERS-WATSON PRESENTATION

In the presentation, Mr. Guven defined price optimization (PO) this way: "Price optimization at its heart is selecting a price that deviates from cost-based indications. That's it." He also pointed out that if the objective in setting prices is to minimize subsidy, "I want to follow my cost model. I don't want to deviate from that (cost-based) indication. I want to minimize subsidization."

Throughout the history of property/casualty insurance ratemaking in America, insurers have insisted that their rates are cost-based and that to introduce subsidies would be inappropriate. Yet, departure from cost-based prices and introducing subsidies into the rates are at the heart of PO, according to Towers Watson (TW).

PO is something new and dangerous, untethering prices from cost and exposing consumers, required to buy auto insurance by the states, to unfettered price gouging.

Central to Mr. Guven's presentation on behalf of TW are two assumptions with which I disagree both as an actuary and as a former regulator. The first problematic assumption is that PO is allowed under the current Casualty Actuarial Society Statement of Principles Regarding Property and Casualty Insurance Ratemaking. The second, and broader, assumption is that PO is merely a technological improvement upon current practices in which companies deviate from cost-based

indications. Understanding the problems with these assumptions sheds important light on the serious and unfair impacts of the use of price optimization techniques by auto insurers.

False Assumption 1: Price Optimization is allowed under the current CAS Statement of Principles (SOP) Regarding Property and Casualty Insurance Ratemaking

The TW presentation suggested that actuarial standards of practice allow for pricing that deviates from cost-based prices. As is discussed in greater detail below, such deviation historically has been, almost without exception, downward. More importantly, the type of deviations presented by TW directly conflict with the principles of the Casualty Actuarial Society (CAS).

The current ratemaking standards clearly relate only to estimating future costs. For example, one principle is "a rate is reasonable, not excessive, not inadequate or unfairly discriminatory if it is an actuarially sound estimate of the expected value of all future costs." Further, the SOP allows data other than "historical premium, exposure, loss and expense experience" to be used only if those data indicate "the general direction of trends in insurance claims costs, claim frequencies, expenses and premium." (i.e., data to inform various trend factor selections).

Varying from the best estimate of cost-based rates according to factors unrelated to risk violates this standard. For example, data on elasticity of demand, a key component of PO, cannot be used under the current SOP since it does not inform us on trends. Indeed, the purpose and formulations of PO cannot be reconciled with the standards of the actuarial practices, which is why a CAS seminar entitled "Price Optimization vs. Actuarial Standards" was held on May 21, 2012.¹ This tension between current actuarial standards and the emerging use of PO has led to a faction in the CAS pushing to rewrite the principles underlying our profession at the behest of firms that sell price optimizing products and the insurers that want to use them.²

¹ The slides for that presentation include such questions as: "Is it in compliance with Statements of Principles (SOPs) and Actuarial Standards of Practice (ASOPs)? SOPs and ASOPs refer to 'costs.' Do costs only consider losses and expenses? Or do they include the effects of demand elasticity and competition?" "Principle 1: A *rate* is an estimate of the expected value of future costs.' 'Principle 2: A rate provides for all costs associated with the transfer of risk.' 'Principle 3: A rate provides for the costs associated with an individual risk transfer.' – Does this mean that Price Optimization is NOT ratemaking? – Are all considerations other than cost-based NOT ratemaking? – Is there a difference between ratemaking and premium development?"

² CAS tried to change the SOP to allow PO last year but reconsidered after I raised the issue, CASTF balked, and California Commissioner Jones wrote that it would be illegal to use PO in California. CAS is once again proposing to change the SOP to allow PO. Towers Watson's presenter before this committee, Mr. Guven, is on the Ratemaking committee of the CAS, so he is undoubtedly aware of the conflict between the current Principles and PO. CASTF forwarded comments to the CAS on the new draft, which again questioned the language since it appears to allow PO under the proposed SOP.

False Assumption 2: Price Optimization is merely a technological updating of, and improvement upon, existing deviations from cost-based indications

The TW presentation suggested that PO simply *removes bias from a presumed current practice of selecting prices that deviate from cost-based indications*. The impact of PO – at the individual consumer level – is significantly different than current practices. The vendors of PO products sell their algorithms to insurers on the promise of higher profits³ tied, at least in part, to the ability to increase prices above cost-based levels on certain types of consumers. PO clearly raises prices above the cost-based level when elasticity of demand calculations indicate that a consumer is unlikely to shop.

I have reviewed thousands of rate filings in over 50 years as an actuary and I have never seen an insurer get approval from the regulator for a systematic increase in rates that are *higher* than the indications. Perhaps Towers-Watson can point us to examples of a scheme of rates selected that were higher than the cost-based indications, filed by an insurer, and approved by a regulator. The only two sorts of deviations from cost-based rates I have seen in rate filings are when a very large increase or decrease in a class or territory is capped so that the increase/decrease is not too much of a shock to the buyers or a downward adjustment to the indication is requested by the filing insurer on a specific territory rate for competitive reasons.

PO, quite distinctly, offers insurers strategies for increasing profit by *systematically* increasing premiums without any risk-based justification, as the TW presentation illustrated on slide 15. PO is a systematic way to raise prices on those who shop less often (including, sadly, the insurer's most loyal customers!⁴) so that profits of the insurer can be enhanced. This sort of systematic upward adjustment of rates above the cost-based indications has never been done in the history of insurance ratemaking to my knowledge. PO is a brand new abuse regulators need to deal with, not the continuation of the same old actuarial judgments as TW alleges.

Regulation of Price Optimization is difficult, if even possible.

On Slide 21 of the TW presentation is this telling statement in their discussion of regulation: "No easy way to see if a company is or is not using the tool." This opacity should alarm members of the Study Group. With no way to know an insurer's pricing methodology, it is not difficult to imagine an insurer using price elasticity data based on race and then matching it to ZIP Code demographics to optimize rates

³ "Companies that adopt price optimization realize substantial financial benefits. These companies see improvement of 1-4 points in the combined ratio..." Price Optimization at the Tipping Point, Advertisement by Earnix pitching their PO product in Best's Review Magazine, 2012.

⁴ Mr. Guven stated clearly that an insured with the insurer for "15 years" was more likely to stay with the insurer at renewal than a new customer.

by ZIP Code. Assuming Mr. Guven agrees it would violate a variety of rules and laws to use race-based pricing strategies, he should explain how a regulator would be able to identify such illegal pricing methods given his stated view that how the algorithms are derived is “not germane” and that only the end result (not the methodological means) matters in ratemaking. A similar concern was noted during the CAS PO seminar of October 2012, during which the panelists agreed regulators were at a “terrible disadvantage” in determining the impact of PO. At that time, I asked panelists representing insurance companies if there was a duty to warn regulators about the use of PO. They said “no.”

This deliberate lack of disclosure also violates Actuarial Standard of Practice 41, “Actuarial Communications,” which states “In the actuarial report, the actuary should state the actuarial findings, and identify the methods, procedures, assumptions, and data used by the actuary with sufficient clarity that another actuary qualified in the same practice area could make an objective appraisal of the reasonableness of the actuary’s work as presented in the actuarial report.” No actuary could figure out how PO was used in a filing today since the filers are purposefully keeping PO behind a curtain of secrecy. If this PO “innovation” is a good thing and something to be proud of, why are the insurers hiding it from the regulators?

Use of elasticity of demand as a rating factor is *per se* unfair discrimination

One’s shopping habits, or willingness to forego a purchase, do not differentiate one insured from another from a risk of loss perspective. Therefore, any use of elasticity of demand to alter rates between customers or groups of customers who are otherwise similar risks should be prohibited as illegal unfair discrimination. Indeed, Mr. Guven’s revelation that under some PO models customers could pay higher premiums simply because they had not complained about their insurance policy or because they were loyal customers or because they purchased their policy through an agent rather than the internet would anger any policyholder (and policymaker as well).

It is well understood by regulators that the mandatory nature of auto insurance makes insurance different than a normal competitive product. The demand for auto insurance is severely inelastic, particularly for the poor forced to purchase state-required minimum limits. It should be, in our view, among a regulator’s highest priorities to protect his or her state’s citizens from paying more than the cost-based price for insurance that the state requires drivers to purchase.

The use of a confidence interval rather than a point estimate is not appropriate

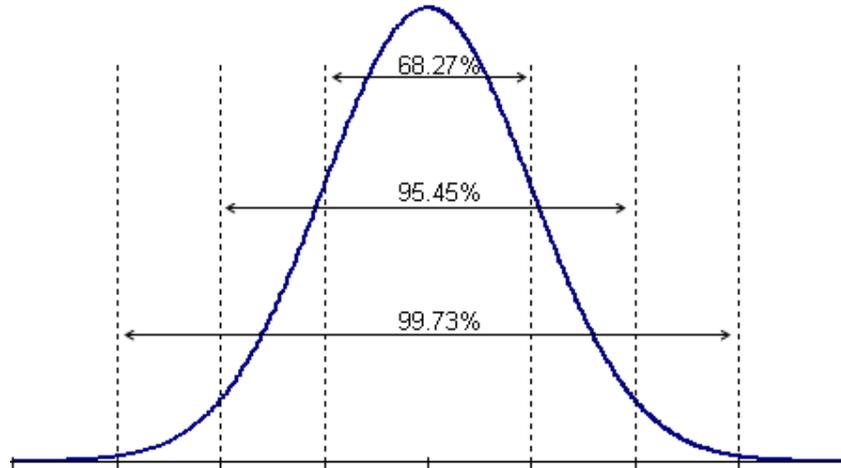
The TW presentation is very clear that PO is “A process for adjusting prices away from a cost-based benchmark to better achieve business objectives” (Slide 10). The

only caveat to this surprising move away from actuarially sound pricing is that these adjustments are acceptable so long as they stay in some (unidentified in rate filings) range of reasonableness (the statistical confidence interval). According to Slide 9, this interval of choice is two standard errors (i.e., two standard deviations) away from the mean cost estimate.

There are several reasons why regulators should reject such an approach, including:

- By definition, the point estimate (the mean of the distribution) is the best estimate available;
- Moving away from the cost-based indication introduces subsidies and cross subsidies in the rate as Mr. Guven acknowledged during his oral presentation. He stated that if the objective is zero subsidization in the rating system the actuary should “select the indication” of the cost-based analysis (i.e., the traditional ratemaking approach). By definition, PO leads to unjustified subsidization, which is unfair discrimination;
- No other point in the confidence interval is as valid an estimate as the traditional point estimate. (e.g., the further the actuary goes out away from the mean (point estimate) in selecting factors or prices toward the outside edges of the interval, the more likely you have selected a number that is invalid);
- Confidence intervals vary in size depending on several factors such as the size of the sample and the choice of the confidence percentage;
- The width of the confidence interval approaches infinity as the sample size decreases toward zero, which will happen as insurers consider more and more variables. With insurers using hundreds of rating factors and tiers, this is a significant problem. (On top of that, Mr. Guven noted that some demand models “can have hundreds of characteristics in them with lots of interaction”);
- Confidence interval width is subject to manipulation by choices made by the actuary;
- Confidence intervals are impossible to regulate (they are not filed, there is too much discretion in how the interval is constructed, etc.);
- There is a confidence interval around each of many rating factors. Bias in selecting within a range can cause great impacts in final rates, calculated by multiplying these factors together, requiring regulators to study much more detail than currently is required; and
- The confidence interval surrounds an indication that is often already the product of a modeling exercise. The days of adjusting historical losses to future expected losses with frequency and severity trends are long gone; claim costs are often modeled using assumptions about frequency and severity distributions with a multivariate generalized linear model.

Not all estimates within the range are reasonable



Above is a graph of a probability distribution, a normal distribution, which shows the likelihood of the actual estimate being within one, two and three standard deviations away from the mean as approximately 68%, 95% and 99.7%, respectively. If, for example, the actuary chose a point that Mr. Guven chose, two standard deviations above the mean, only 2.275% ($1/2 * [100.00\% - 95.45\%]$) of the entire distribution is in the tail to the right of that selection. It is clearly unreasonable to be pricing near the tails of the distribution instead of at the point estimate, which is the mean and best estimate.

Consider the example Towers-Watson used showing a confidence interval range of \$400 to \$600 around a point estimate of \$500 (Slide 15). It is impossible for a price of \$600 to be as reasonable an estimate of expected claims as a price of \$500. But the argument of those selling Price Optimization packages seems to be that every point in the confidence interval is equally valid as an estimator. If regulators accept that argument, then we must ask the obvious question: "Why should a regulator allow a price higher than the low end of the confidence interval for this legally mandated insurance product when the lowest rate in the interval is as equally valid as any other choice in the interval?"

Slide 9 gives a clear picture of how PO can be used to exploit this proposed application of confidence intervals. The light green lines are 2 SEs (Standard Errors or Standard Deviations) from the point estimate (the mean). Note that the optimized points are all equal to or higher than the indicated points, making this a very honest presentation of what is likely to happen in practice. Mr. Guven said the X-Axis points are rating factors. Thus, if these factors were applied to an insured, the final answer from multiplying the factors would be much higher than the indicated since many of the factors are inflated. For example, the factor identified as "17" has an indication of about 7, an optimized selection of about 10.5, and the range of SEs is about 2 to 12, (the mean plus or minus 5 points). Selecting a confidence interval of 2 SEs allows the factor to be raised in this example by 50% (10.5 divided by 7). This is clearly an unreasonable departure from the indicated, cost-based factor and is an unfairly discriminatory selection in my opinion. And this is only one

selection of a rating factor above the indication. As Slide 9 reveals, several other factors were selected above the indication. Imagine the impact on a particular insured when several of these higher than risk-based rating factor selections are multiplied together to arrive at the final rate.

The claim that PO is not a rating factor is untrue.

In arguing against both regulatory oversight and PO transparency, Mr. Guven said in his oral presentation that a “retention score” is not a rating factor in the USA unless it is correlated with loss costs. The claim of price optimization proponents that PO is not a rating factor is belied by the fact that it is applied on a systematic basis at the individual policy level based on demand scoring models. So, as Mr. Guven explained, complaining will impact your score as would your coming to the insurer via the Internet as opposed to through an agent. The score based on these factors will impact your price; *it is undeniably a factor that impacts rating.*

P.O. is a rating factor called something else, reminiscent of insurers using rating tiers to avoid disclosing the underlying rating factors they used. The fact that the PO factors are unrelated to expected losses makes the factors per-se unfairly discriminatory, but it does not transform the PO factors into something other than a rating factor. A rating factor is a characteristic of the consumer, vehicle or property used to determine premium -- whether it is related to claim costs (like an accident) or not related to claim costs (like calling the insurer to complain).

QUESTIONS TO ASK TOWERS-WATSON

CFA proposes that the following questions be posed to TW:

1. How is a commissioner going to assess the impact of price optimization unless he or she can review the models or, at least, a tabulation of the effect by rating factor and the aggregate effect for at least enough drivers to understand the overall impacts?
2. Slide 9 states: “Actuarial Standards of Practice acknowledge that companies charge a final price in line with other business objectives.” Historically judgment and competition are typically used to explain the selection of lower than indicated rates, and this is disclosed to regulators. Can you show examples of a filing where an insurer systemically raised rates above the indicated rate, informed the insurance department of that, and received approval of such a selection?
3. If price optimization moves the rate away from the traditional risk-based rate isn't that per se unfairly discriminatory? How do price optimization techniques ensure that two otherwise identical risks are not charged a different price (either in the rate table or tier placement) based on non-risk related factors? Please provide a real-world example of the process

that guarantees that no identical risks are charged a different rate or placed in either a different tier or a different insurer.

4. In your oral presentation you stated that the selection of the point estimate (the mean of the distribution) should be made if the objective of the filer is to have “no subsidy.” In other words, to use other than the traditional cost-based indication introduces subsidies into the rate structure. Why don’t the subsidies and cross-subsidies produced by PO result in unfair discrimination?
5. Do you believe that small overcharges to consumers (above the risk-based mean of the distribution levels) meets regulatory standards but large ones, using the same methods, would not? Where is the point at which the increase fails to meet the standards? Is it, as slide 9 suggests at two standard deviations from the mean?
6. How does TW assure that rates are not raised on the basis of income either directly or through proxies for income? This is particularly important to know since lower-income Americans are having trouble affording state required auto insurance and regulators need to know if lower-income people will be adversely impacted even further by price optimization.
7. During your presentation, you did not mention price elasticity of demand even though it is discussed extensively in other TW documents. Does your algorithm include evaluation of consumers’ responsiveness to price changes? If so, under your algorithm, would a consumer (or class of consumers) found to be less responsive to price changes be identified for upward adjustments in premiums? How do you determine consumer (or class of consumers) responsiveness to price?
8. Has TW ever tested price elasticity by race or ethnicity? Have you tested it by income? Would it be OK to use race or income as a basis for your rate segmentation? Would it be OK to use proxies for race or income as a basis for your rate segmentation?
9. Since price optimization is marketed as a technique to increase profits for the insurer, are higher prices produced by price optimization excessive since they derive from prices above the indicated cost-based price?
10. If, as you say, the regulatory process for price optimized rates and non-price optimized rates “remains the same” and the regulator has “no easy way to see if a company is or is not using the tool” (Slide 21) how does a regulator determine if the rates being presented are optimized or not?
11. Do you advise your clients to be sure to disclose to the regulators that

your products have been used to optimize the rates being filed or do you advise them not to disclose it? Please supply documentation of any advice you give clients regarding the disclosure of information to regulators related to insurers' use of price optimization.

12. Do you advise your clients or the insurer producers to be sure to disclose to their consumers that your products have been used to optimize the rates being filed or do you advise them not to disclose it? Please supply documentation of any advice you give clients regarding the disclosure of information to consumers related to insurers' use of price optimization.
13. Please provide the manual or other information you supply to insurers when they decide to use your price optimization product. This should cover not only the advice you give insurers on how to run the software but any advice you give them relative to how to interact with regulators and consumers when asked questions about the product. Do you ask to be involved if a regulator asks one of your clients about your price optimization product? Also, do you in any way restrict the insurers ability to disclose if and how price optimization is used when a consumer asks if it is used? Please supply all documents relative to this as well.
14. Is the place where rates are optimized in America always in a rate filing or is it, in some cases, in underwriting standards or in alternative product selection or at the point of sale? Please identify with precision all of the ways price optimization can be used to alter a price from the risk-based level in the United States. In places with so-called "open competition" laws, like Illinois, does TW use a different price optimization model than in a place with tighter regulation, such as California? Please explain for each regulatory regime (prior approval, file and use, use and file, flex and open rating) how the TW model changes if at all.
15. Please give us examples, based on your experience, of segments most likely to be optimized upward in price. Describe in detail a series of characteristics that would lead a customer's premium to be increased as a result of optimization?
16. Explain in detail the process of reverse engineering the prices in a rate structure to change them from risk-based to optimized. Is this reverse engineering ever disclosed in a rate filing? If so, please provide examples of filings where it was disclosed.
17. Should vendors of price optimization products be regulated as advisory organizations since their tools directly alter prices consumers pay for state required auto insurance?
18. Is territory one of the factors that price optimization uses in determining

optimized prices? How does the TW optimizer protect the public from the possibility that price optimization could be used to “redline” territories through high prices not justified on a risk-basis?

19. Do any factors used in a price optimization algorithm overlap with factors used in the traditional risk-based rating process such as territory or type of vehicle. For example, driving a Volvo might lower a premium based on the risk-based factor “vehicle type.” But what if a price optimization tool uses vehicle type as a measure of elasticity and finds that a Volvo buyer is unlikely to shop around and thereby subject to an upward adjustment? In other words, is it possible that the impact of an optimizing factor increases or decreases the impact of the rating factor?
20. At slide 15, there is discussion of “a search space for one policy.” At slide 16, the caption is “Constrained search spaces are simulated for each individual policy.” Is this application of PO to each specific auto insurance policy in an insurer’s portfolio done anywhere in the USA? If used in this way, how can rates that vary between individuals based on changes in demand elasticity pass muster as not being unfairly discriminatory?
21. Research suggests that low- and moderate-income auto owners might be struggling with affordability of state-required auto insurance. Since research by Brookings and others indicates that the poor do not shop as much as other consumers for financial services products, isn’t it likely that price optimization will make state-required auto insurance even more unaffordable for the poor in America? Please identify any steps the T-W model takes to mitigate PO impacts on low- and moderate-income policyholders.

Conclusion

CFA is certain that price optimization will undermine actuarially sound pricing and produce illegal, unfair rates. We call upon the NAIC to ban its use. This Study Group has an important obligation to warn all of the state insurance departments of the dangers of PO and the fact that many insurers are already using PO, albeit without revealing it to regulators. As such, insurance customers all across the nation are already being harmed by this opaque and insidious practice.

Sincerely,



J. Robert Hunter, FCAS, MAAA
Director of Insurance