Price Optimization: A Direct Challenge to Regulatory and Actuarial Requirements for Cost-Based Insurance Pricing

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The Center for Economic Justice

CEJ is a non-profit consumer advocacy organization dedicated to representing the interests of low-income and minority consumers as a class on economic justice issues. Most of our work is before administrative agencies on insurance, financial services and utility issues.

On the Web: www.cej-online.org

Why CEJ Works on Insurance Issues

Essential Financial Security Tool for Individual and Community Economic Development: CEJ Works to Ensure Access and Fair Prices for These Essential Products and Services, particularly for Low- and Moderate-Income Consumers.

Primary Institution to Promote Loss Prevention and Mitigation: CEJ Works to Ensure Insurance Institutions Maximize Their Role in Efforts to Reduce Loss of Life and Property from Catastrophic Events.

Overview

1. Public Policy Goals and Insurer Purposes of Cost-Based Pricing

2. What is Big Data, What is Price Optimization

3. Big Data Mining and Price Optimization – Undermining Cost-Based Foundation of Insurance Rate Regulation and Actuarial Principles

Big Data Defined

- Massive databases of information about (millions) of individual consumers

- Associated data mining and predictive analytics applied to those data

- Scoring models produced from these analytics.

Public Policy Goals of Cost-Based Pricing

The statutory requirements for insurance rates reflect a requirement for cost-based pricing: Not excessive, not inadequate and not unfairly discriminatory.

Not unfairly discriminatory means no arbitrary pricing – similarly situated consumers in terms of cost of transfer of risk must be treated the same

Actuarial ratemaking principles also require cost-based pricing – a rate is an estimate of the cost of the transfer of risk.

Public Policy for Requiring Cost-Based Insurance Pricing

There are important public policy reasons for requiring insurance rates to meet cost-based requirements.

1. Protect Insurer Financial Condition

2. Promote Loss Mitigation by Providing Incentives for Less Risky Behavior and Disincentives for More Risky Behavior. Provide proper economic signals to consumers when evaluating risk of investments – in home or vehicle. And encourage behavior that lessens likelihood of a catastrophic event (car accident) or the damage resulting from such event (resilient homes)

3. Prevent arbitrary treatment of consumers based on intentional or unintentional biases of insurers.

Why is Insurance Different from Other Consumer Products?

There are reasons for this regulatory structure and public policy goals

1. The insurance is required – by state law and by lenders requiring protection of home or vehicle collateralizing the loan. Limits normal competition

2. Contract is a promise for future benefits if an undesirable event occurs   Again, limits normal competition

3. State laws and regulatory structure protects insurers from consumer challenges on rates.

Price Optimization – Big Data and Modeling of Rates/Prices

<u>Old Old School Big Data</u>: Advisory Organization Loss Costs. Oversight of Data, Advisory Organization, Analytic Techniques, Filings, Complete Transparency

<u>Old School Big Data</u>: Credit-Based Insurance Scores. Limited Consumer Protections for Completeness and Accuracy of Data via the FCRA, Limited Oversight of Modelers and Models, Limited Transparency. But many the FCRA, supplemented by many states' laws provides some consumer protections – disclosure, opportunity to correct data errors, life exceptions.

<u>New School Big Data</u>: Predictive Modeling of Any Database of Personal Consumer Information. No Consumer Protections for Completeness and Accuracy of Data, No Oversight of Modelers and Models, No Transparency to Consumers

Offensive Price Optimization – Not Difficult to Define

Adjusting Cost-based Rate Indications
to Prices that Optimize Profitability

Proxies may be used for profitability – retention, cross-sales

Price Optimization is an import from Europe where there is no regulatory oversight of pricing. Pricing may be and is adjusted by the minute to extract the greatest profit from consumers with the aid of Price Optimization. Europe has no requirement for rates to be cost-based.

Like other big data applications – P.O. based on non-insurance information – shopping habits, magazine subscriptions, web browsing, data broker info.

Insurer Justification for Price Optimization

1. **"We've always done it!"** Insurers have always deviated from indicated rates for a variety of competitive and business reasons, relying on management judgment for such deviations. PO is simply a more scientific, data-driven approach to employing such management judgment.

2. **"It's not rating, it's management judgment, so we don't even have to file it!"** Rating factors are factors related to costs of transfer of risk – loss costs or expenses. Since PO is not related costs of transfer of risk, it is not a rating factor and, consequently, not subject to regulatory oversight.

3. **"It's still cost-based pricing!"** There is a statistical confidence interval around the indicated rate and any selection based on management judgment within that confidence interval is actuarially sound.

Insurer Justification for Price Optimization (Con't)

4. **"We only use PO to take less than the indicated rate – it promotes rate stability!"** The deviations from indicated rates are always between current and indicated rates – it's like the rate capping we have always done.

5. **"More accurate pricing gives us more confidence to write more business!"** Insurers are in the risk management business. The more we can understand and accurately price risk, the more business we can write.

Insurers' Actual Historical Deviation from Indicated Rates

- Historical deviation from rates has typically been an insurer selecting a lower rate than the indicated rate.

- Regulators have not routinely approved insurer requests for, say, a 20% rate increase when the insurer's indication is for a 5% rate increase.

- Historical deviation from indicated rates has almost always been a lower selected than indicated rate and the lower selection has been across broad risk groups

Price Optimization is Not Risk Classification

- <u>Definition</u>: A risk classification/rating factor is any characteristic of the consumer, vehicle or property utilized by the insurer to determine the premium charge.

- Rating factors must be risk classifications to comply with statutory rate standards; that is, a rating factor must related to expected costs of the transfer of risk – expected losses or expenses to issue and administer the policy.

- PO is clearly a rating factor as it is based on individual consumer characteristics and is applied to individual consumers to determine the premium charge for that consumer. At once, it is now obvious that PO is an impermissible rating factor because it is not related to the cost of transfer of risk,

"PO Not Applied to Individual Consumers, But to Risk Classes"

- Modeling of Rates and Ultra-Refined Risk Classification Has Created Tens of Millions of Rating Cells Within A State – Far More Rating Cells Than Policyholders

- Allstate Complementary Rating Group (CRG) includes factors based on birthdates – two consumers otherwise identical but born a day apart are treated differently. CRG factor based on rating territory, gender, years with prior carrier and birthdate.

Allstate CGR Rating Examples

- Drivers with same gender, rating territory and years with prior carrier:

Birthdate	Rate Relativity	Rate Impact
4/16/1943	0.9803	
4/17/1943	1.0510	+7.2%
12/7/1980	0.9374	
12/8/1980	1.0252	+9.4%
7/4/1983	1.1784	+13.2%
7/7/1983	1.0406	

Huh? Allstate to Regulator

To determine the CGR factor for each existing policy, a policy is first assigned to a micro-segment which is defined by these four characteristics: territory, birth date of the oldest operator, years with prior carrier, and gender of the oldest operator. Micro-segments are then assigned to the Complementary Group (and ultimately CGR factor) that best reflects the micro-segment's expected loss cost under the new loss model while limiting large rate swings, lessening disruption, and ultimately reducing the adverse impact on retention of implementing the new loss model directly. A micro-segment's rate is not determined by the four characteristics that define its micro-segment; rather, the Complementary Group Assignment table determined by the four characteristics generates a very detailed, granular structure that allows Allstate to provide the policy the most appropriate rate based on the expected loss considerations for the particular micro-segment. In other words, even though two risks may have the same rating territory, gender, and YPC and have birthdates only one day apart, the micro-segment assignment incorporates current premium based on the current approved rating plan, indicated premium based on our newer loss model and marketplace considerations.

Allstate to Investors

Our operating priorities for the Protection segment include achieving profitable market share growth for our auto business as well as earning acceptable returns on our homeowners business.

Key goals include:
• Improving customer loyalty and retention;

• Deepening customer product relationships;

• Improving auto competitive position through price optimization;

Small Midwest Insurer Auto Filing: Big Data Run Amok

Rating Plan with Millions of rating cells for a book of business of 25,000 policyholders.

"Geo-Demographic Data" for Creating ZIP Code Factors initially based on "1,044 Raw Demographic and 600 industry NAICS variables."
Factors include:

Medicare Payments
Quality of Life Index
Manufacturing Employment
Alcoholic beverage at home
Artificial sweeteners
Bathroom Linens
Blue Collar Profile
Dating Services

Hospital Room and Services
Margarine
School Lunches

"Adjustments Are Within the Confidence Interval"

- A confidence interval is created around the output of a statistic or statistical model. The size and nature of the confidence interval is determined by inputs chosen by the modeler, including the type of probability distribution used and the size of the data set used (e.g., number of observations), among many other factors.

- Ratemaking has been transformed from actuarial analysis of historical experience into a modeling exercise. Modeling is highly subjective and the results of the underlying ratemaking model can be manipulated, e.g., choice and parameters of probability distributions selected for frequency and severity.

- Concept of "confidence interval" renders actuarial indication meaningless as "confidence interval" can be a huge range around the indicated rate.

"PO is Simply Rate Capping"

This is a good example of vendors and insurers telling regulators one thing and telling clients (insurers) and stockholders, respectively, something else.

Vendors pitch price optimization as improving insurer profitability, including prices based on price elasticity of demand – charging more for consumers unable or unwilling to shop around in the face of a rate increase.

PO is based not only on consumer demand models, but also on micro-analyses of competitor pricing. Consequently, consumers in "non-standard" markets – low-income and minority communities – are adversely impacted because of the lack of competitive alternatives in those communities.

"PO Lets Us Write More Business – Insurance Markets are Competitive"

We see this old chestnut anytime there is a proposal to limit insurer pricing practices. **PO – <u>by definition – is predicated on markets not being competitive.</u>** Moreover, insurance pricing – without PO – is already so granular that insurers have the information to manage risk and write all the business they want to write. Many insurers simply do not want to write certain types of consumers. As Ed Liddy said in 20015, when he ran Allstate:

"Tiered pricing helps us attract higher lifetime value customers who buy more products and stay with us for a longer period of time. That's Nirvana for an insurance company. That drives growth on both the top and bottom line."

"This year, we've expanded from 7 basic price levels to 384 potential price levels in our auto business."

"Tiered pricing has several very good, very positive effects on our business. It enables us to attract really high quality customers to our book of business."

"Make no mistake about it, the economics of insurance are driven largely by retention levels. It is a huge advantage. And our retentions are as high as they have ever been."

"The key, of course, is if 23% or 20% of the American public shops, some will shop every six months in order to save a buck on a six-month auto policy. That's not exactly the kind of customer that we want. So, the key is to use our drawing mechanisms and our tiered pricing to find out of that 20% or 23%, to find those that are unhappy with their current carrier, are likely to stay with us longer, likely to buy multiple products and that's where tiered pricing and a good advertising campaign comes in. It (tiered pricing) has raised the profitability of the industry."

PO Undermines Public Policy Goals of Risk Classification

- Undermines Risk Classification as Tool to Assure Financial Condition of Insurer – Replaces traditional and proven actuarial analysis for rates with modeling of prices. Introduces modeling risk to financial condition of insurers.

- Undermines Loss Mitigation Role of Insurance by Making Pricing More Opaque to Consumers and Less Related to Activities a Consumer Can Take or Avoid to Impact Pricing.

- PO Also Undermines the Cost-Based Regulatory Structure – arbitrary rates, disparate impact claims and lawsuits against insurers.

Seven States Have Issued Bulletins About Price Optimization

Maryland, Ohio, Florida, California, Vermont, Washington and Indiana

Vermont: While there is no universally-accepted definition of price optimization, the practice, in some of its applications, involves the judgmental use of factors not specifically related to a policyholder's risk profile to help determine or adjust his or her insurance premium. An example would be using an individual policyholder's response to previous premium increases to determine how much of a premium increase the policyholder will tolerate at renewal before engaging in comparison shopping or switching to a different insurer. This practice can result in two policyholders receiving different premium increases even though they have the same loss history and risk profile.

Vermont:

Property and casualty insurers doing business in Vermont are reminded that all ratemaking must · conform to the statutory requirements . . .unfair discrimination is considered to exist if price differentials "fail to reflect equitably the differences in expected losses and expenses" for different classes of policyholders. In classifying policyholder risks for ratemaking purposes, insurers are allowed to use rating plans "which provide for recognition of probable variations in hazards, expenses, or both." *As these sections make clear, both base rates and rating classes must be based on factors specifically related to an insurer's expected losses and expenses.* While insurers may employ judgment in setting their rates, judgmental adjustments to a rate may not be based on non-risk-related factors such as "price elasticity of demand" which seek to predict how much of a price increase a policyholder will tolerate before switching to a different insurer.

Vermont:

The use of such factors not only unfairly discriminates between policyholders of the same risk profile, *but is also directly in conflict with the statutory principles that underlie Vermont's "open and competitive" property and casualty marketplace.*

PO and Big Data Models Lack Fundamental Consumer Protections

- Accuracy and Completeness of Data
- Oversight of Data Bases
- Disclosures to Consumer About Data Used and How Used
- Consumer Ability to Challenge False Information
- Regulators' Knowledge Of and Capability to Provide meaningful Oversight
- Prevent discrimination Against Low-Income and Minority Consumers and other protected classes
- Asymmetric Use of Data
- Greater Cybersecurity Danger for Consumers and Insurers

Regulatory Oversight of Insurers' Use of Big Data: Existing Risk Class Regulation Doesn't Work

Existing risk class regulation based on old old school big data, where regulators have oversight of all factors going into pricing and the data underlying the risk class analysis of rating factors and relativities.

Today, regulators simply do not have the resources to monitor all the databases and scoring models used by insurers nor access to the data underlying these new models.

If it is unrealistic to expect regulators to provide the type of historical review of advisory loss costs to new pricing tools, what is the way forward?

Regulatory Oversight of Insurers' Use of Big Data:

The current approach of allowing insurers to use any factor they want unless specifically prohibited does not fit with current data availability and technology. Regulators and legislators need to consider an approach of pro-actively identifying permissible risk classifications based not only on actuarial considerations, but also public policy goals of loss mitigation and availability.

Step 1. Each state should require insurers to report all types of data used for sales, marketing, underwriting, pricing and claims settlement, the sources of the data and the uses of the data.

Step 2. The regulatory framework should shift from use anything unless specifically prohibited to regulatory review prior to use to ensure basic consumer protections are in place and data use is consistent with public policy goals of insurance.

Step 3. Regulators and Legislators should establish public policy that loss mitigation should be a consideration in approving a risk classification. Avoid black box models that rob system of loss mitigation – encourage telematics to provide feedback to consumers to modify behavior in real time as opposed to simply another opaque pricing factor.

Step 4. Regulatory Big Data for Monitoring Market Outcomes

If regulators' ability to monitor what goes into marketing, sales, pricing and claims practices is realistically limited, then monitoring market outcomes is essential:

- Who is offered what insurance products at what prices in what locations?

- How are different groups of consumers treated in claims settlement?

Regulatory Big Data as a tool and strategy to improve effectiveness, efficiency and uniformity of state-based insurance market regulation.

Regulatory Big Data Already Used/Planned
By State Insurance and Other Financial Regulators:

- <u>Home Mortgage Disclosure Act</u> data on individual mortgage applications by state and federal banking regulators
- <u>Statutory Annual Statement</u> data on individual bonds and investments by insurance prudential regulators
- <u>PBR</u> Transaction data on life insurance, disability insurance, long-term care insurance and annuities by insurance regulators as part of principles-based reserving.
- <u>FINRA Comprehensive Automated Risk Data System (CARDS)</u> – data relating to securities and account transactions, holdings, account profile information (excluding personally-identifiable information and securities reference data.