4.1.1 Regulatory and Operational Constraints   ⏱ 15m

Regulatory Constraints

The U.S. insurance industry is highly regulated. The exact regulations vary between states and are typically enforced by state law and state regulatory agencies.

Different lines of insurance products are subject to different levels of regulation. Compulsory lines such as personal auto and workers' compensation tend to face stricter oversight compared to optional lines such as commercial property.

Most U.S. insurers are required to file proposed manual rates with the appropriate state insurance department. The filing requirements vary by state and insurance product, ranging from relatively minor ones, such as simply requiring a copy of the manual rates to be filed with the governing agency, to more restrictive measures, such as only allowing the insurer to set rates within a specific range. Below is a list of potential U.S. regulatory constraints.

- Restricting the use of certain actuarially indicated rates

- Limiting the amount a rate can change, either the overall average rate or the rate for a single group/individual

- Requiring insurance companies to provide customers with advanced notice of a rate change

- Prohibiting the use of certain rating variables, such as credit scores in personal lines

- Prescribing specific ratemaking techniques, such as multivariate analysis

Furthermore, disagreements on the indicated rates may arise between the company's actuary and the regulator, which need to be resolved before a rate can be implemented. For example, the regulator might disagree with the ratemaking assumptions used by the actuary. Resolving these disagreements is often time-consuming and could potentially delay the implementation of the new rate. So, it is important to recognize this potential cost.

Although insurance companies must comply with regulations, they aren't totally powerless. A company can:

- Take legal action to challenge the regulation

- Revise their underwriting guidelines to avoid writing policies at an inadequate rate level

- Change their marketing scheme to try to minimize the number of new policyholders whose rates are believed to be inadequate

- If a rating variable is banned, they could use a different but related variable (e.g., if "credit score" is banned, consider payment history)

Operational Constraints

Implementing a rate change or introducing a new rating variable isn't without costs. In some cases, systems limitations or resource constraints may make it difficult or expensive for a company to modify its existing rating algorithm. For this reason, a company may choose to forgo taking an otherwise actuarially-sound rate change.

A *cost-benefit analysis* can be used to evaluate a company's potential options and select an appropriate course of action. In general, this involves evaluating the costs and the benefits of taking a certain action over a certain period of time called the **time horizon**. If the benefits outweigh the costs over the time horizon, then the company should consider making the change. The evaluation often requires making assumptions about how the change will affect policyholder retention. We'll illustrate this concept through a simple example.

An insurer is considering adding a risk characteristic to their current rating plan that would result in the rate changes in the table below.

Class	# of Policyholders	Expected Loss Cost	Current Rate	Proposed Rate
Y	50	600	1,000	950
Z	150	700	1,000	1,050
Total	200	675	1,000	1,000

The insurer's retention model predicts the following:

Class	Predicted # of Renewals	
	Do not Implement	Implement
Y	50	55
Z	150	135
Total	200	190

The one-time cost of implementing the new rating plan is $2,000. Assume that the number of predicted renewals applies to all future years. Recommend whether or not the insurer should implement the rate change using:

1. A time horizon of one year.

2. A time horizon of two years.

Start by calculating the annual profit under both scenarios. Note that the total annual expected profit per policy can be calculated as a weighted average of the annual expected profit per policy for each class.

If the insurer decides to **implement** the new rating plan:

Class	# of Renewals	Annual Expected Profit Per Policy	Total Annual Expected Profit
Y	55	$950 - 600 = 350$	$55 \times 350 = 19{,}250$
Z	135	$1{,}050 - 700 = 350$	$135 \times 350 = 47{,}250$
Total	190	350	66,500

If the insurer decides to **not implement** the new rating plan:

Class	# of Renewals	Annual Expected Profit Per Policy	Total Annual Expected Profit
Y	50	$1{,}000 - 600 = 400$	$50 \times 400 = 20{,}000$
Z	150	$1{,}000 - 700 = 300$	$150 \times 300 = 45{,}000$
Total	200	325	65,000

So, implementing the new rating plan results in an increase in annual profit of $66{,}500 - 65{,}000 = 1{,}500$.

However, implementing the new rate has a one-time cost of $2,000. Thus, over a one-year time horizon, the rate change actually decreases profit by $500. Over a two-year time horizon, the increase in annual profit would compensate for the one-time cost of implementation.

Time Horizon	Increase in Expected Profit	Cost of Implementation	Cumulative Change in Expected Profit
1 Year	1,500	2,000	$- \$500$
2 Years	1,500	0	$+ \$1{,}000$

So, we **do not recommend** the rate change with a 1-year time horizon, but we **do recommend** the rate change with a 2-year time horizon.

A final consideration is that an insurer may have limited access to information. For example, they may wish to incorporate a new rating variable into their current rating plan but be unable to do so

because it would require policyholder data that has not previously been collected.