The Fairness in insurance enigma: exploring the maze of regulation

The Obama administration released a report in 2014 entitled “Insurance is particularly interesting because the use of AI in finance raises concerns for consumers who feel particularly vulnerable.”

The Data Protection Act suggests incoming discussions regarding fairness:

“A person who is responsible for a high-impact system must, in accordance with the regulations, establish measures to identify, assess and mitigate the risks of harm or biased output that could result from the use of the system.” – Bill C-27 (House of Commons of Canada)

### Regulation in the world

- The United Kingdom has adopted a version similar to the GDPR with the Data Protection Act 2018.
- The United States showcases a mosaic of regulatory stances (Xin and Huang, 2023), ranging from stringent anti-discrimination measures (e.g., California) to prohibitions regarding a few highly sensitive variables (e.g., Texas).

### Recommendations of Quebec’s financial authority

- Autorité des marchés financiers (2021) is consistent with influential reports such as Bengio et al. (2018).
- Formally, the principle of fairness states that similar cases should be treated similarly. [...]. The whole problem is to understand what is meant by similar cases.
- (Autorité des marchés financiers, 2021)
- Autorité des marchés financiers (2024) also places “treating consumers with fairness” as a crucial best practice (4 out of 30).

### Recommendations of actuariai organizations

Actuarial organizations demonstrate their interest in fairness in insurance:

- “CAS Approach to Race and Insurance Pricing” (CAS, 2021)
- “Avoiding Unfair Bias in Insurance Applications of AI Models” (SOA, 2022)
- “Fairness Metrics for Life Insurance Processes: An Actuarial Perspective” (SOA, 2023)
- “Fairness in Pricing and Underwriting of Property and Casualty (PC) Risks” (CIA, 2023)

The actuarial organizations recommend to proactively identify and mitigate biases through stakeholder engagement and risk management.

### Examples of explicit prohibitions in auto insurance

<table>
<thead>
<tr>
<th>Province</th>
<th>Prohibited variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>NB</td>
<td>age, gender, and marital status</td>
</tr>
<tr>
<td>NS</td>
<td>age and marital status</td>
</tr>
<tr>
<td>NFL</td>
<td>age, sex, marital status, and non-fault accident history</td>
</tr>
<tr>
<td>ON</td>
<td>credit history, occupation, and homeowner status</td>
</tr>
</tbody>
</table>

### Where is unfairness in insurance operations?

- **Accessibility**
  - "Weblining" (Hernandez et al., 2001)
- **Service**
  - Uncensored bias (Casualty Actuarial Society, 2022)
- **Underwriting**
  - Independent reserves’ systematic denial (Duchaine, 2020)
- **Ratingmaking**
  - Solidarity or Individualization? (Barry, 2020)
- **Business adjustments**
  - Non-risk-based pricing (Guy, 2012)
- **Claims**
  - Inequities in claim settlement (Lin et al., 2022)

### What should we care?

The Obama administration released a report in 2016 in which data scientists were urged to analyze “how technologies can deliberately or inadvertently perpetuate, exacerbate, or mask discrimination.”

### References

- Kusner, M. J., Liu, J., Gilmer, Y., and
depending, the judgment of the actuary’s predecessors.