Navigating High-Inflation: Tactics for Actuaries

Giovanni Andrea Frigeri, Akur8

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About the speaker

- **Giovanni Andrea Frigeri –** *ML Product Manager, Akur8*

  I hold a B.Sc and M.Sc in Physics from the University of Milan (Italy) before pursuing my PhD in Theoretical Physics at the University of Leipzig (Germany). In 2022, I transitioned to Akur8 in Paris, initially as a Data Scientist and now serving as a Machine Learning Product Manager.

- Akur8 is revolutionizing non-life insurance pricing with Transparent AI. Our cloud-based, fully integrated platform empowers insurers to price at unprecedented speed, directly influencing financial outcomes and enhancing risk assessments.

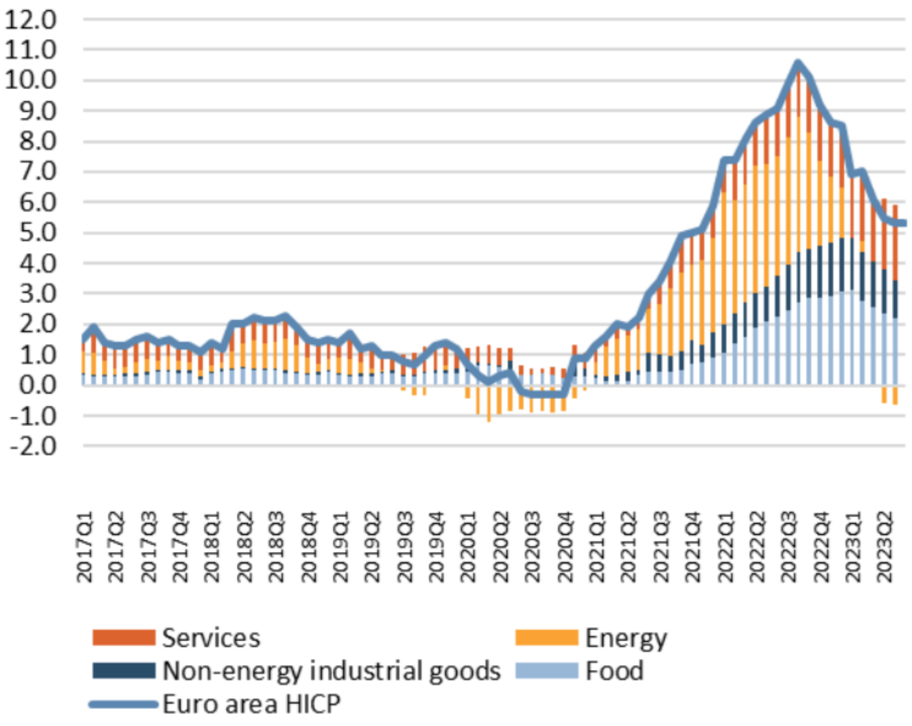
Inflation in general

- **Inflation** is a general **increase** in the **price** of goods and services over a period of time.

  To put it simply, you can buy less today than you could yesterday with the same amount of money.

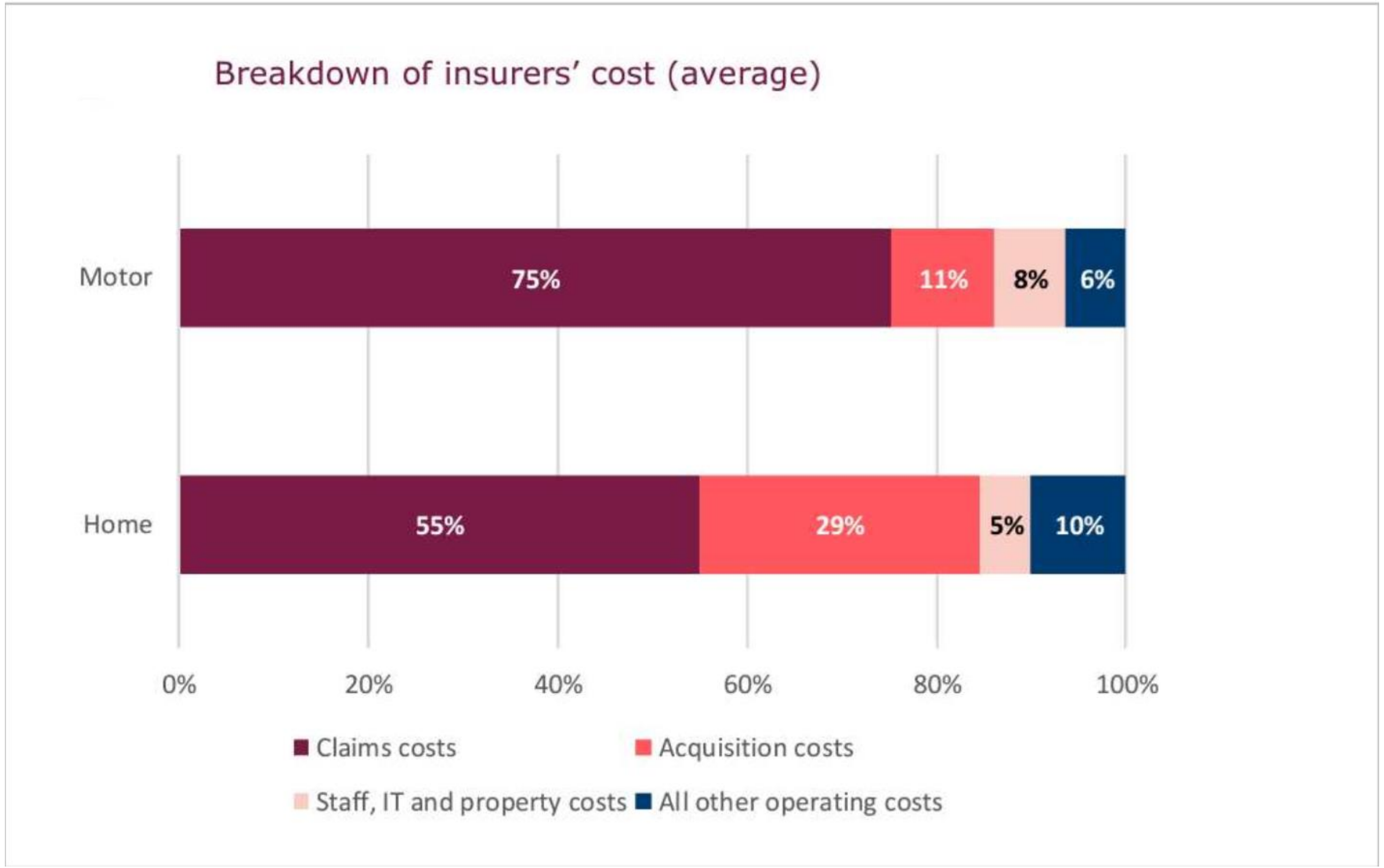
- Reasons:
  - Rising consumer demand after Covid-19 pandemic
  - Supply chain disruptions
  - Rise in energy and commodity prices
  - Russia's invasion of Ukraine and rising geopolitical tensions
  - Green transition
  - Demographic changes and decline in working population

Figure 2.1: HICP main components (annual % changes)



HICP: harmonised index of consumer prices. Source:ECB.
Last observation: Aug 2023.

Inflation in insurance

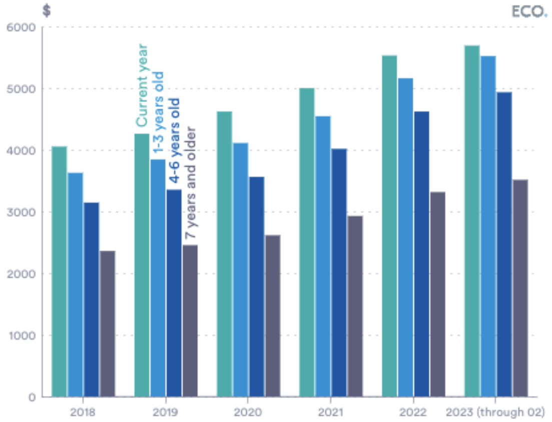


Split of motor and home premium as reported by the FCA.

Inflation in insurance

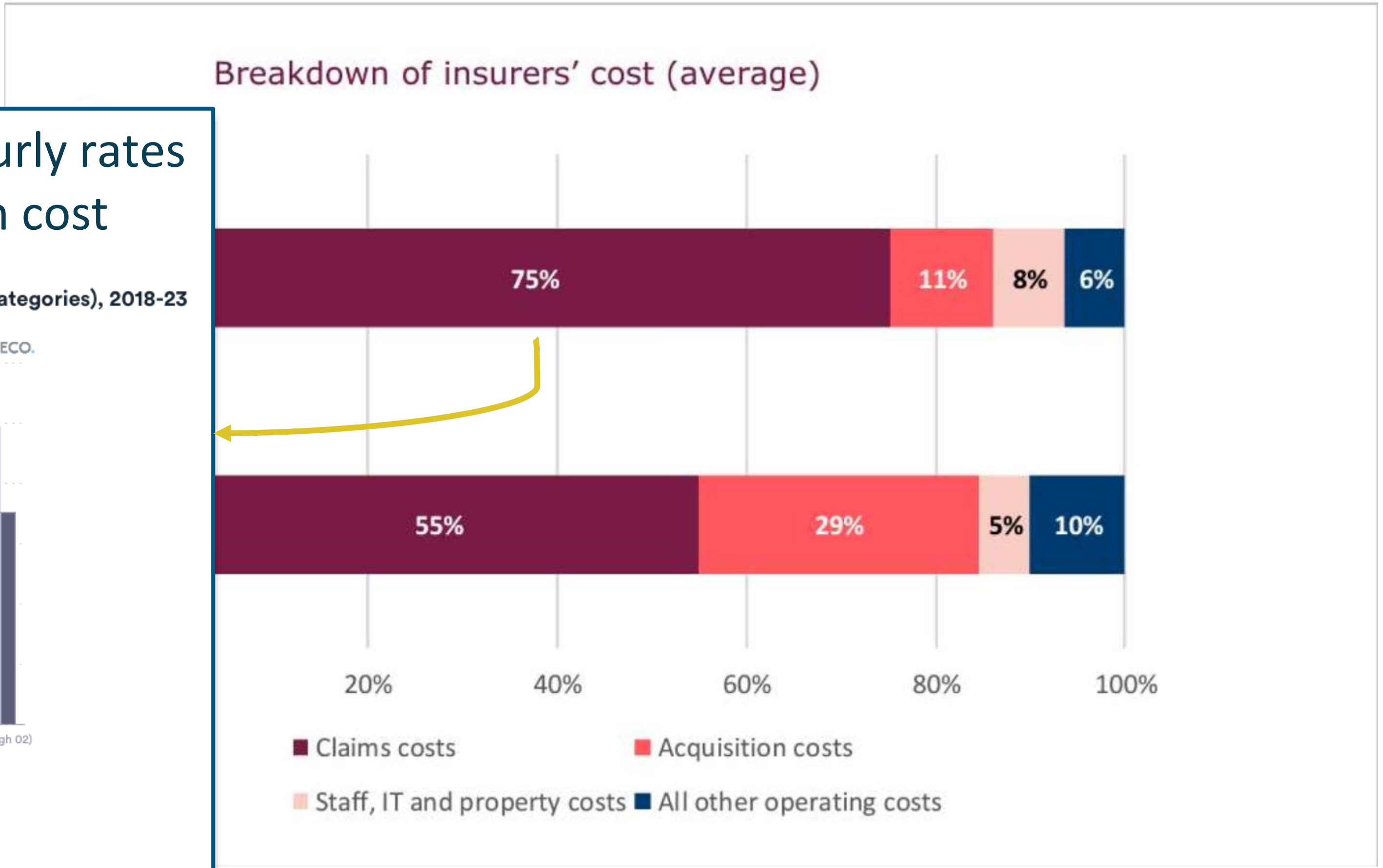
- Repair costs and hourly rates will impact the claim cost

Figure 4: Average TCOR by vehicle age (all loss categories), 2018-23



Source: CCC Intelligent Solutions

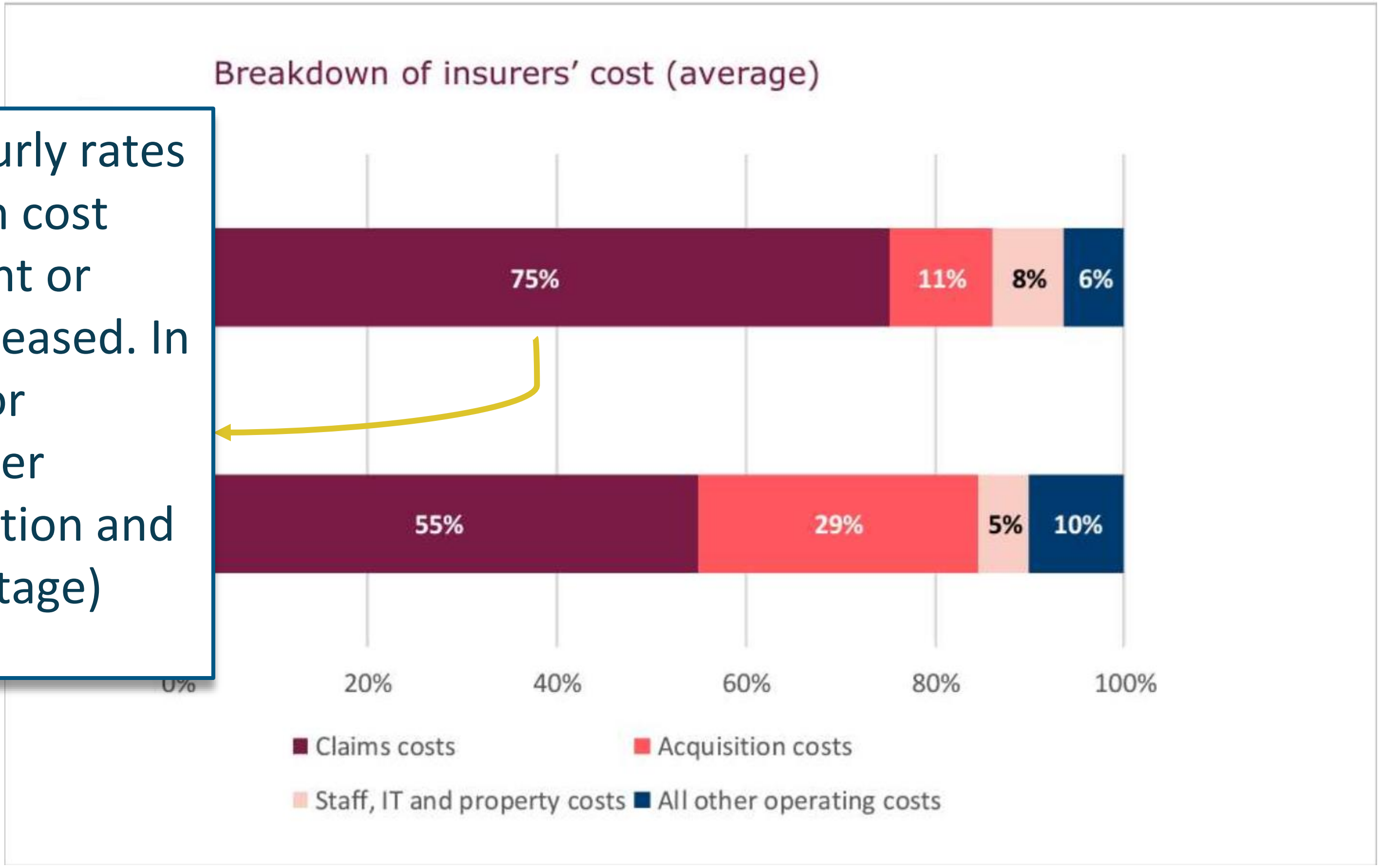
TCOR: total cost of repair



Split of motor and home premium as reported by the FCA.

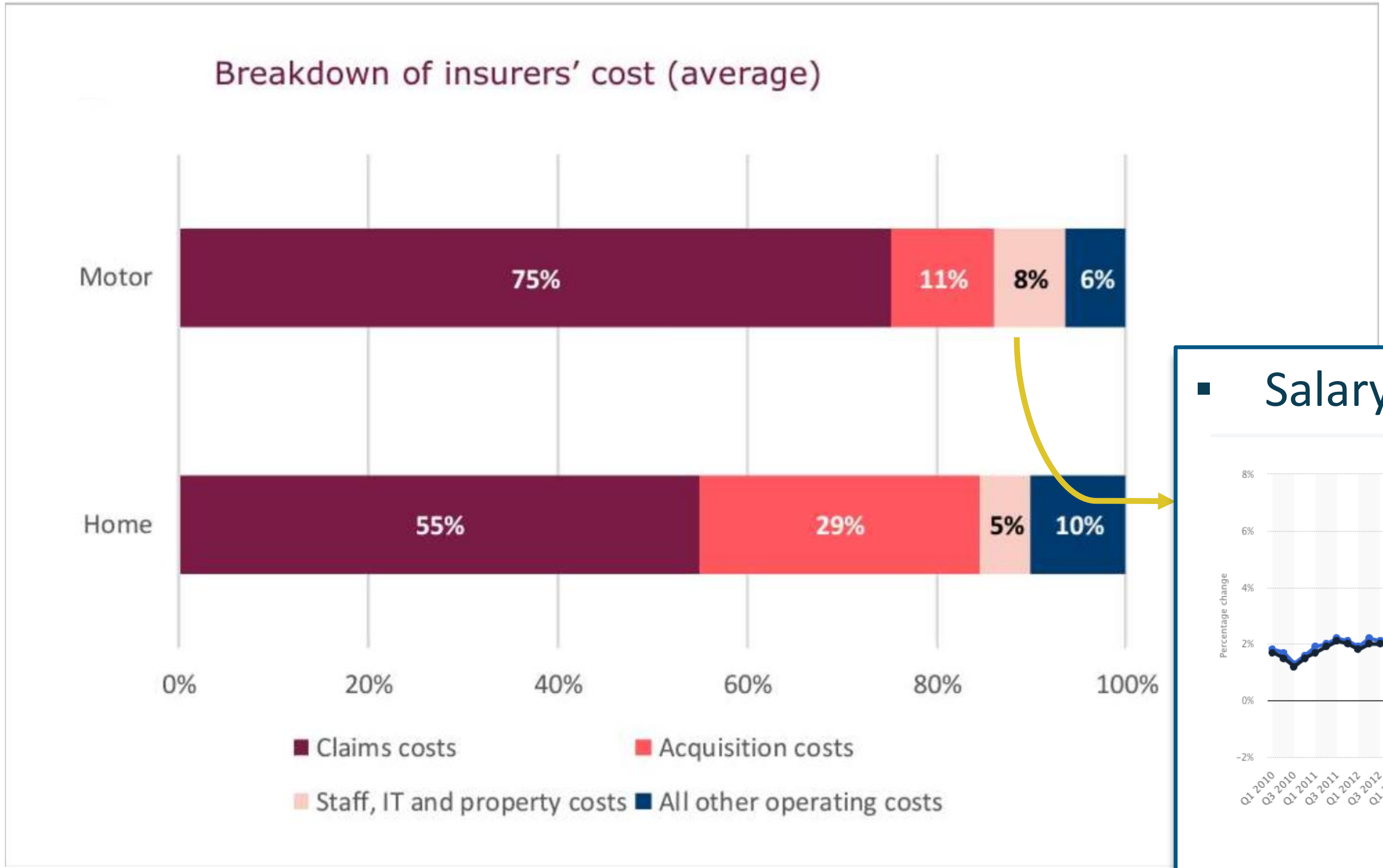
Inflation in insurance

- Repair costs and hourly rates will impact the claim cost
- Prices of replacement or rental cars have increased. In addition, the time for reparations got longer (supply-chain disruption and semiconductor shortage)



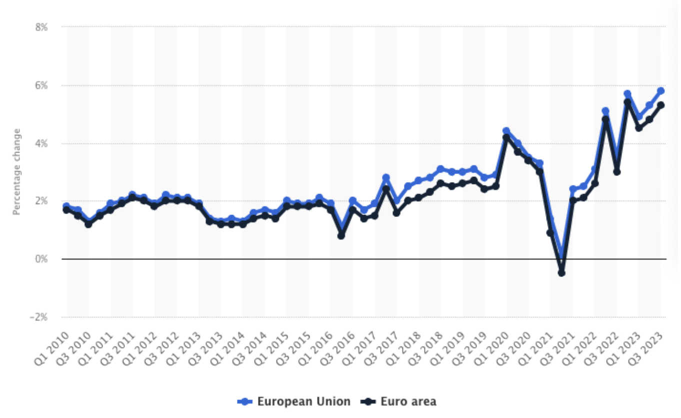
Split of motor and home premium as reported by the FCA.

Inflation in insurance



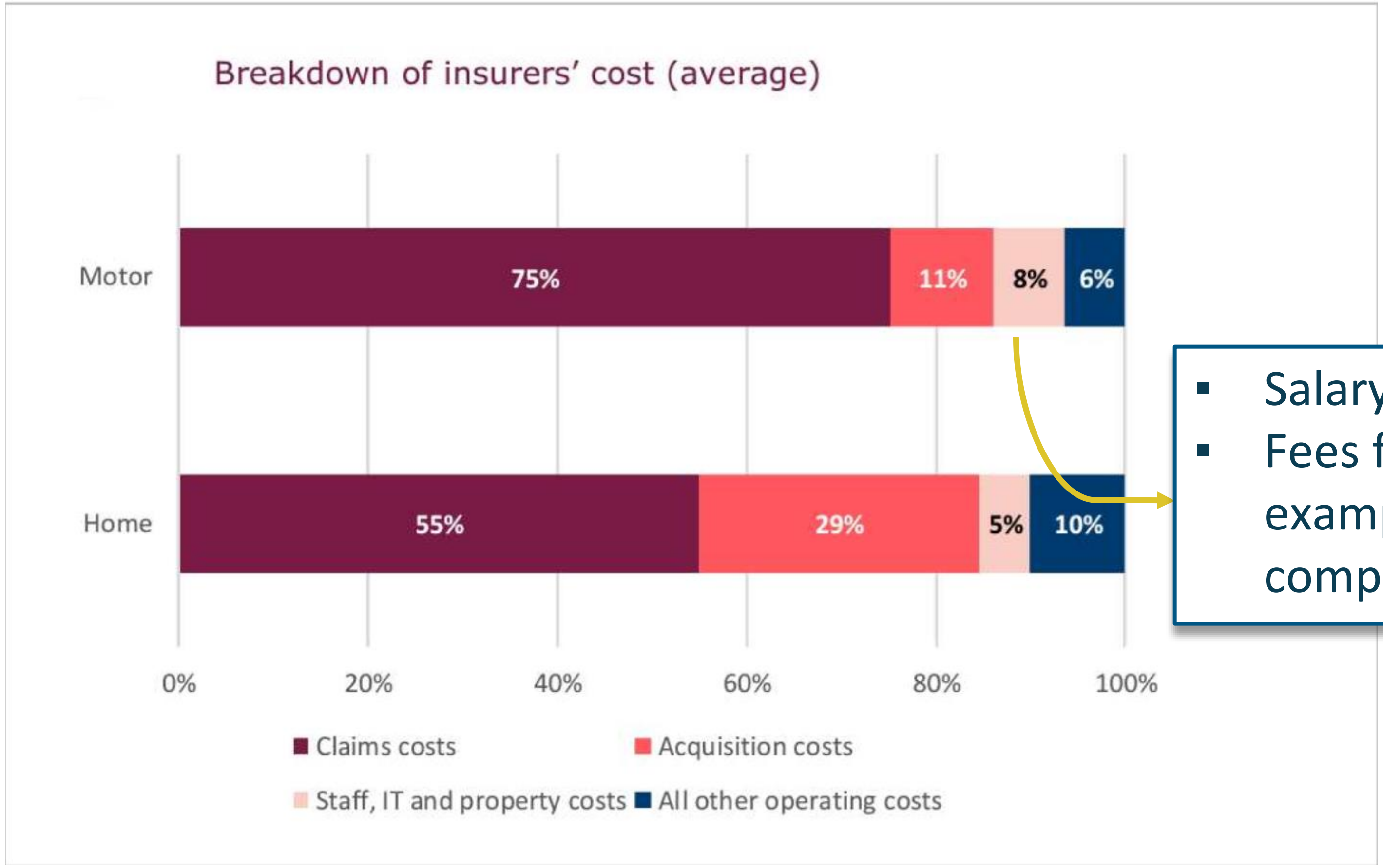
Split of motor and home premium as reported by the FCA.

- Salary inflation



Nominal wage growth in European Union and Euro area.
Source: Statista.

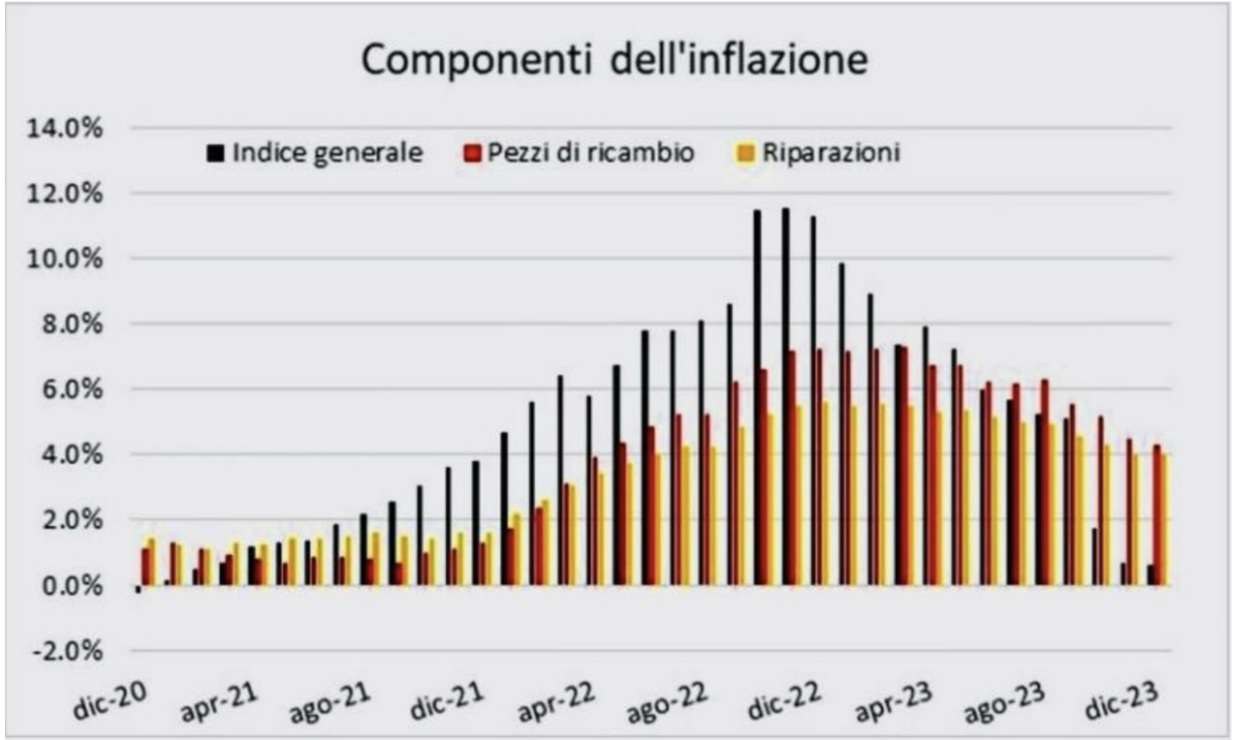
Inflation in insurance

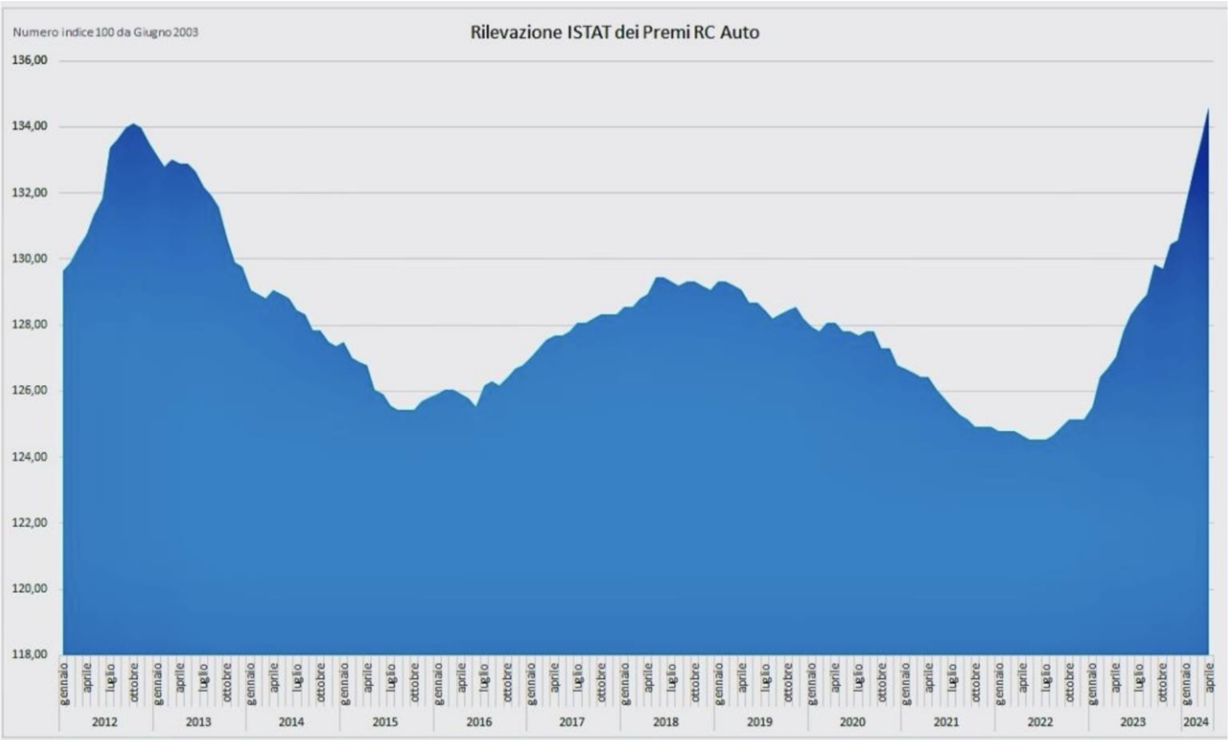


- Salary inflation
- Fees for services (for example for price comparison websites)

Split of motor and home premium as reported by the FCA.

Inflation in insurance is more persistent





Images taken from Salvatore Infantino - LinkedIn (link) for the italian market

The nebulous relationship between Inflation and Frequency

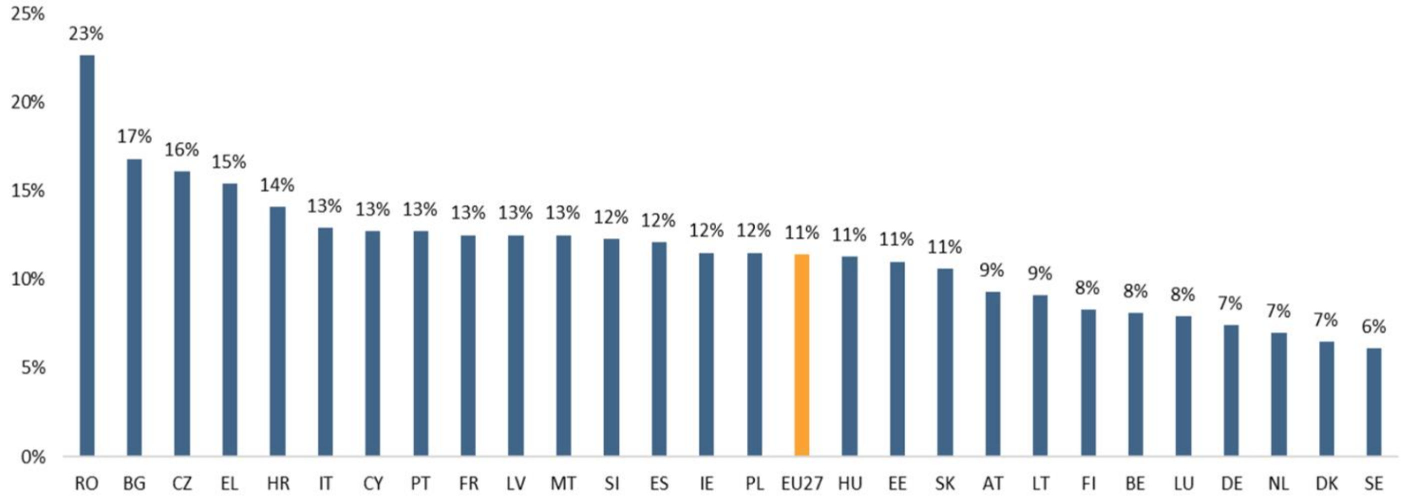
- Several studies have linked periods of inflation to crime, specifically **property crime**. We might expect greater **frequency** due to **theft** and **vandalism.**
- **Deferred maintenance**:
  - Failure to keep up with things such as tuckpointing on brick buildings can lead to water intrusion or require the entire wall to be replaced.
  - Driving with worn brake pads or worn tire treads. increases the risk of an accident
- Inflation may impact claim **frequency** positively through mileage, because **fewer** miles are driven

Impact on customer behavior

Table 6.2: Percentage of EU consumers, amongst those who did not buy or renew selected insurance products, by reason leading to the decision.

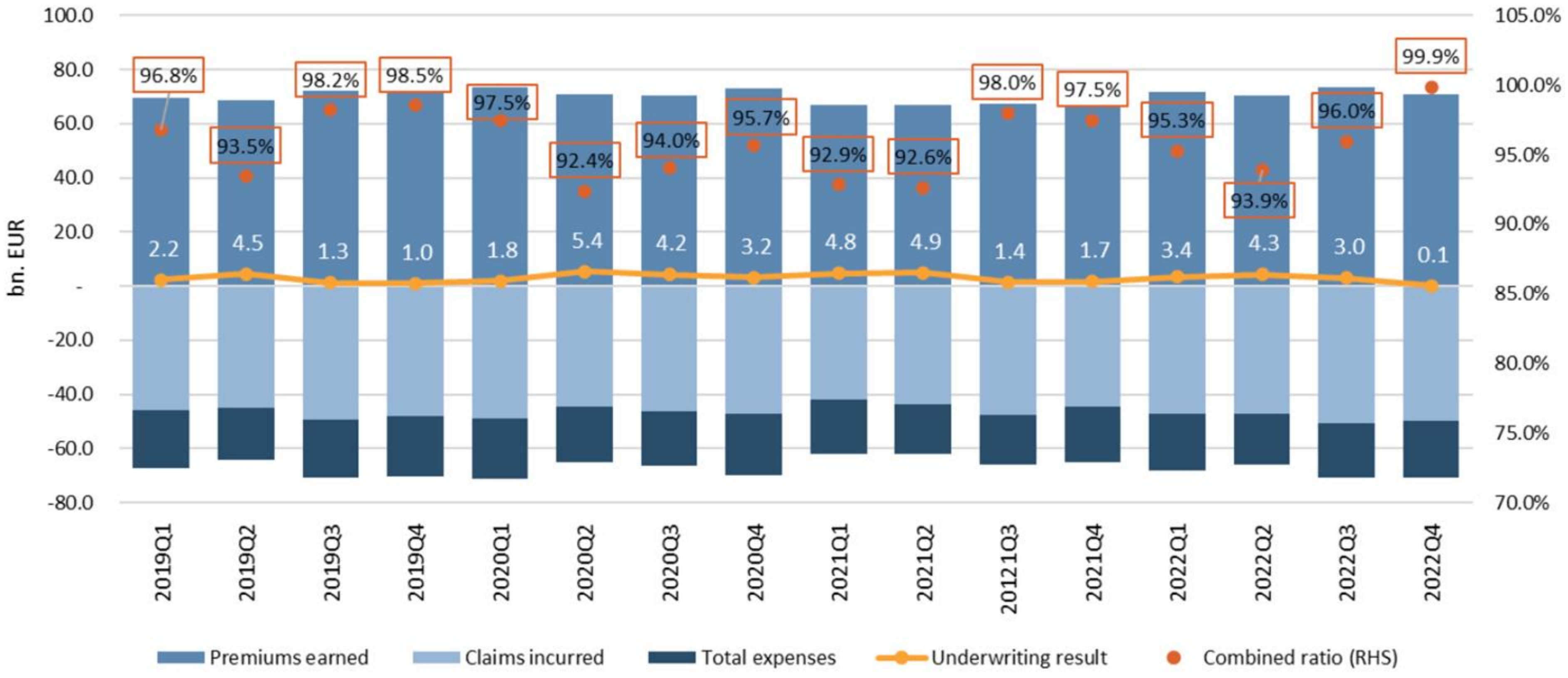
	Household insurance	Accident and health insurance	Any other insurance policies
Because of cost-of-living increase	58%	56%	61%

Figure 6.7: Percentage of EU consumers that feel underinsured as the potential pay-out of their insurance policies would not fully cover expenses due to inflation.



Source: EIOPA's Eurobarometer Survey, July 2023

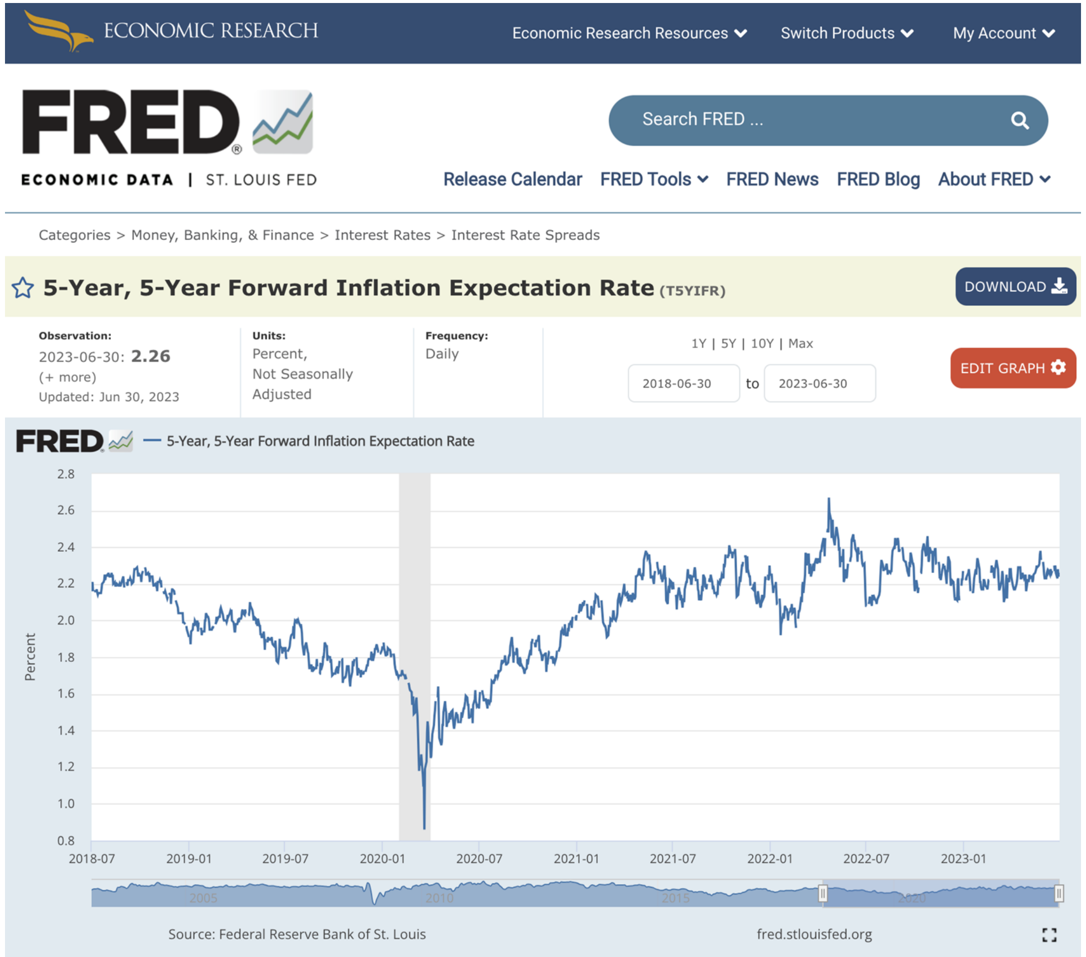
Putting all together: a challenge for profitability



Source: SII QRTs data, quarterly prudential solo. Reference date: Q4 2022

Strategy 1: Improving estimates of future inflation

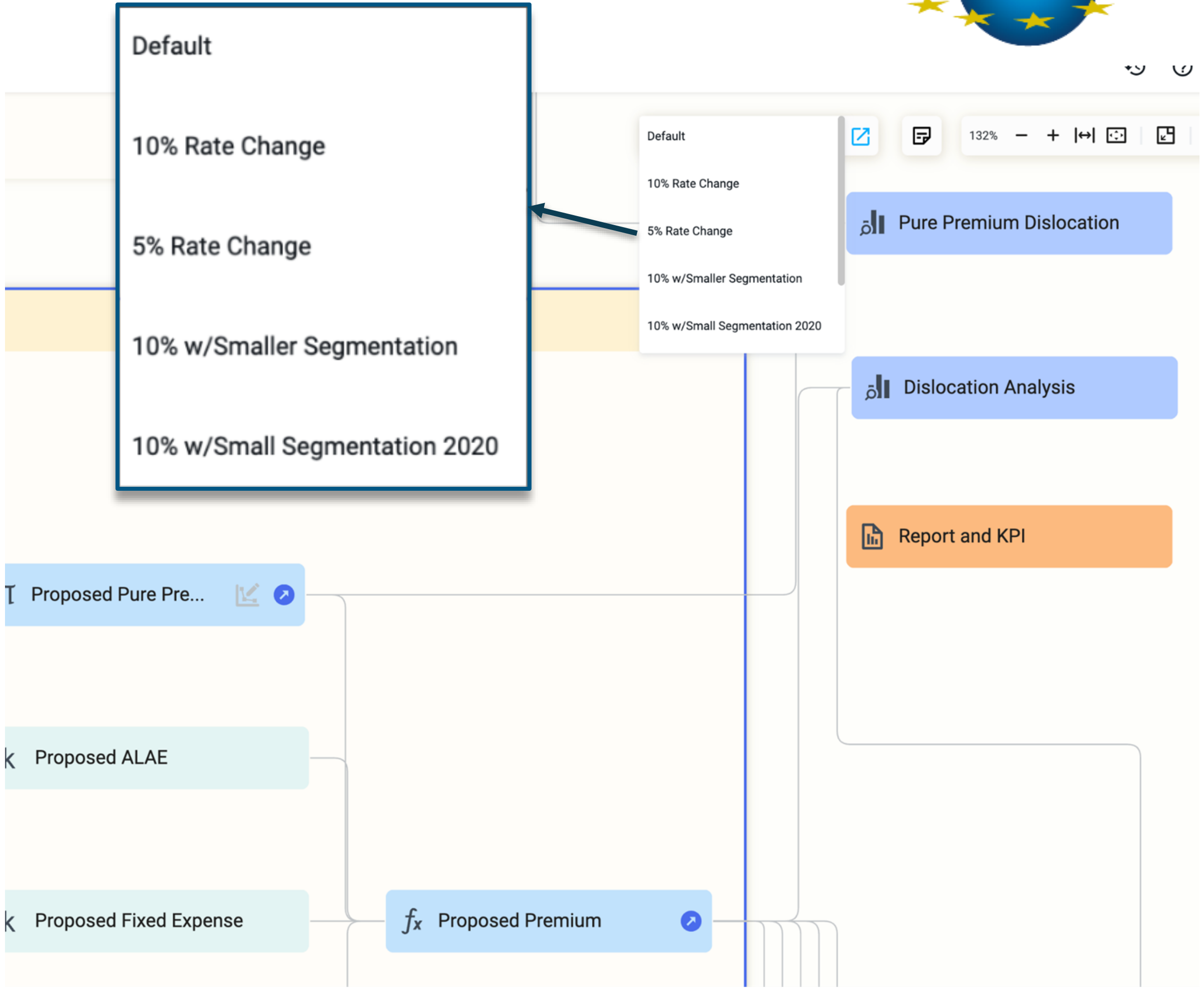
- Inflation is most apparent in the severity portion of loss cost
- It applies a strong **upward** force on the base rate or overall rate need
- Improving **estimates** of future inflation
  - Using inflation indices and interest rates
  - Using historical trends
  - Incorporating forward-looking inflation expectations



Strategy 2: Utilizing scenario analysis

- Scenario analysis is increasingly feasible with modern tools and computation methods

- Allows for a deeper relationship between the **models** and the **strategy** and **decision making**:
  - Moving from point estimates to a range of scenarios
  - Explicit acknowledgment of the uncertainty
  - Enables insurers to contextualize their decisions and measure them against a plausible outcome



Strategy 3: Adjusting the product offering

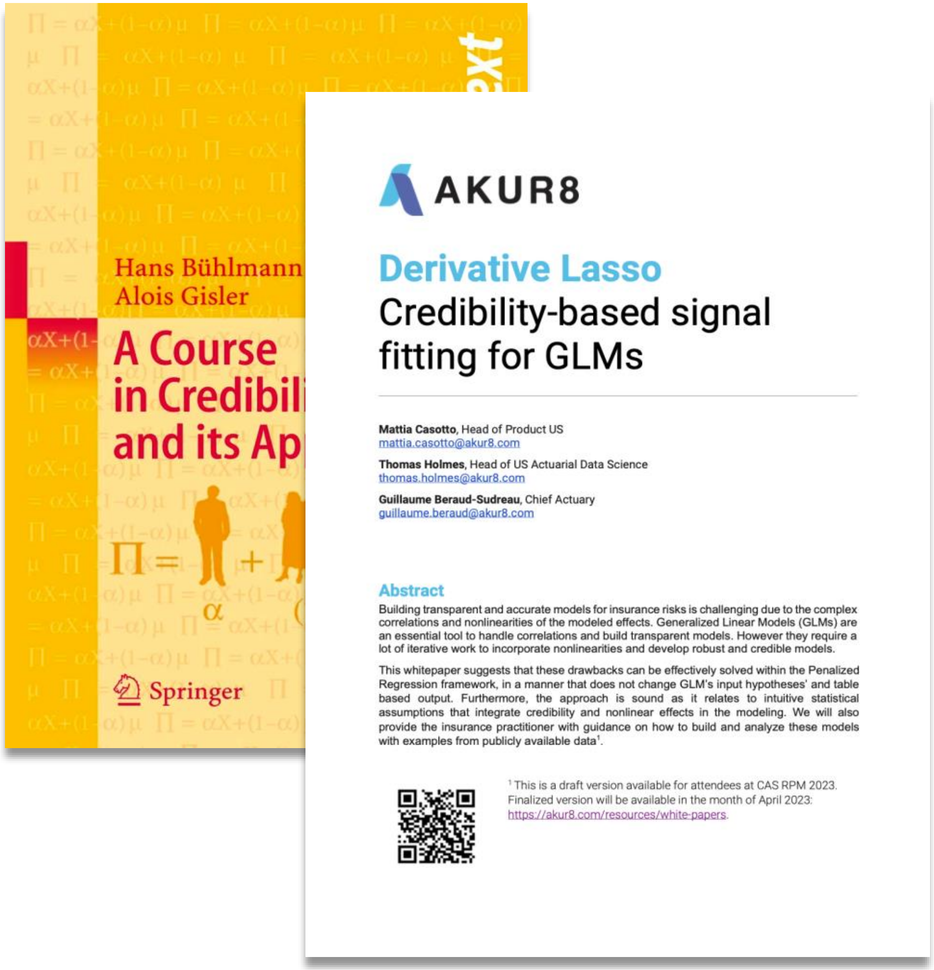
- Changing the **product** can be a powerful tool
  - Changing deductibles, limits, coverage options, sum insured etc can alleviate the pressure on price

- It comes with **serious considerations**
  - Can impact customer satisfaction and retention
  - Comes with legal consequences and heavy communication burden to agents and policyholders

Strategy 4: Utilizing a Credibility Approach

- Periods of inflation are often associated with periods of instability

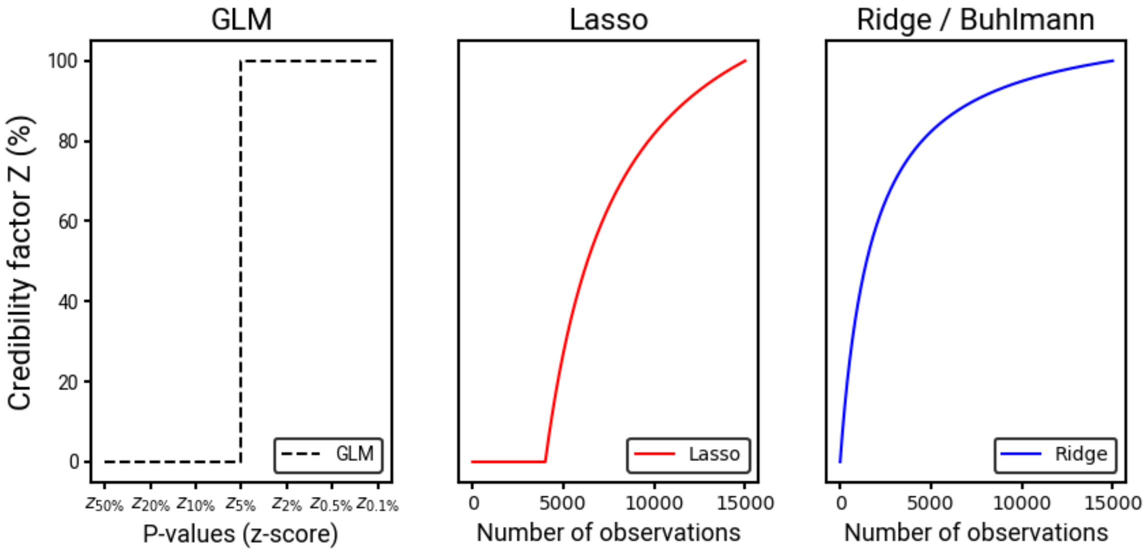
- Leveraging a **credibility** approach to pricing models can be a highly effective way of balancing **responsiveness** and **stability**:
  - The update should move us in the right direction and correct a gap that existed in our existing rates
  - All else being equal, we should minimize the update to keep our prices stable over time

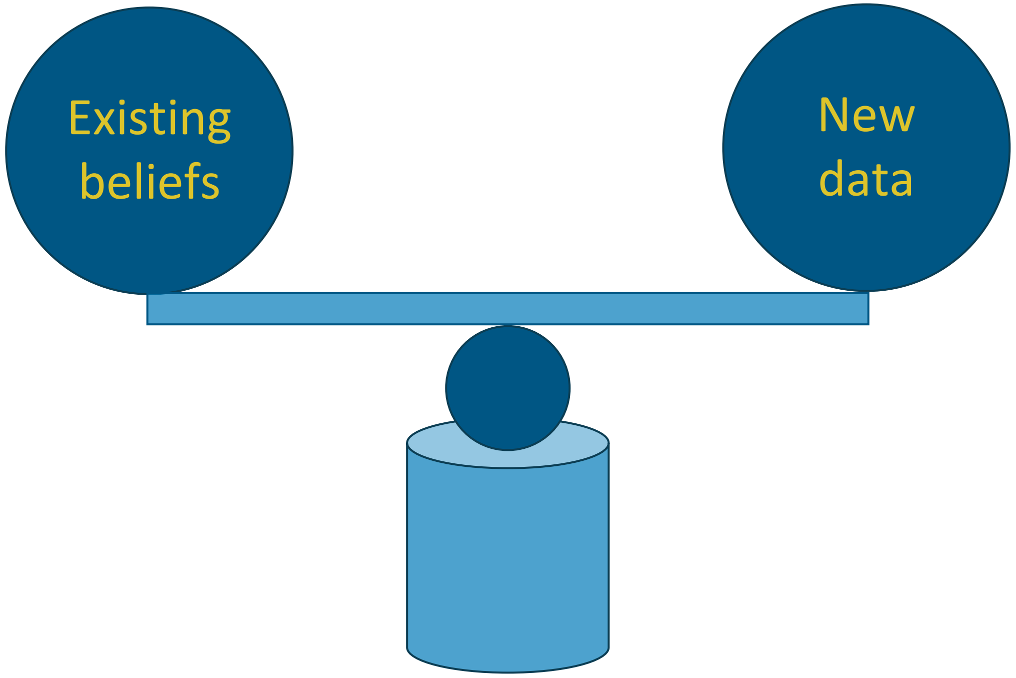


Credibility and Penalization

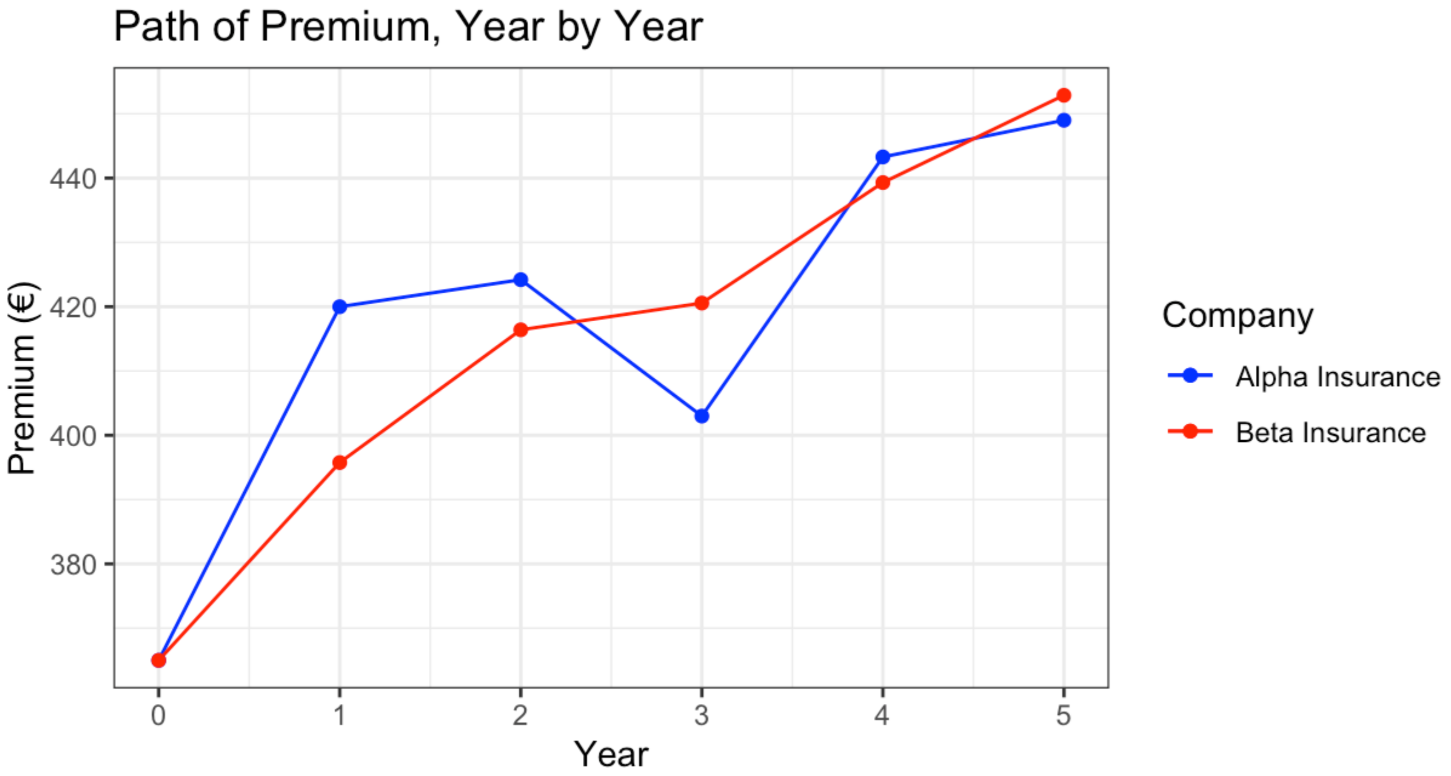
A **credibility** procedure is an approach that combines **claims experience** with **existing beliefs** to achieve a more accurate assessment of risk.

This is useful for quickly incorporating **signal** from new data **without overfitting**.





Prices stable over time



Strategy 5: Improving time to market

- High inflation does not necessarily change the role of a pricing actuary. However, it does not mean the future [may] behave less like the past more quickly, and this puts pressure on companies to react **quickly** when things change.
- However, there are several considerations:
  - Taking rate before your competitors can increase churn
  - Departments of Insurance might not appreciate constant filings

Conclusion

- Review inflations and some of the complications associated with it
- Demonstrate that inflation impacts more than just the base rate and claim severity
- Discuss strategies for actuaries to stay ahead of inflation and price volatility
    - Improving **estimates** of future inflation
    - Utilizing **scenario** analysis
    - Adjusting the **product** offering
    - Utilizing a **credibility** approach
    - Improving **time to market**

Thank you

References

- “Pricing in an Age of High Inflation“ (Graham – Akur8, Eriksson - FCG)
- “Credibility and Penalized Regression“ (Casotto, Holmes and Beraud-Sudreau – Akur8)
- “Impact of inflation on the insurance sector“ (EIOPA, October 2023)
- “Inflation in motor insurance“ (Rudi Van Delm)

Contact Details

E-mail: giovanni.frigeri@akur8.com or come to our booth!
Company website: www.akur8.com