The role of actuary in modern insurance

New trends and challenges

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Agenda

We will try to answer the following questions:

- What do actuaries do in modern insurance?
- Why does this need to transform?
- What are the drivers of change in the future role of actuaries?

Introduction

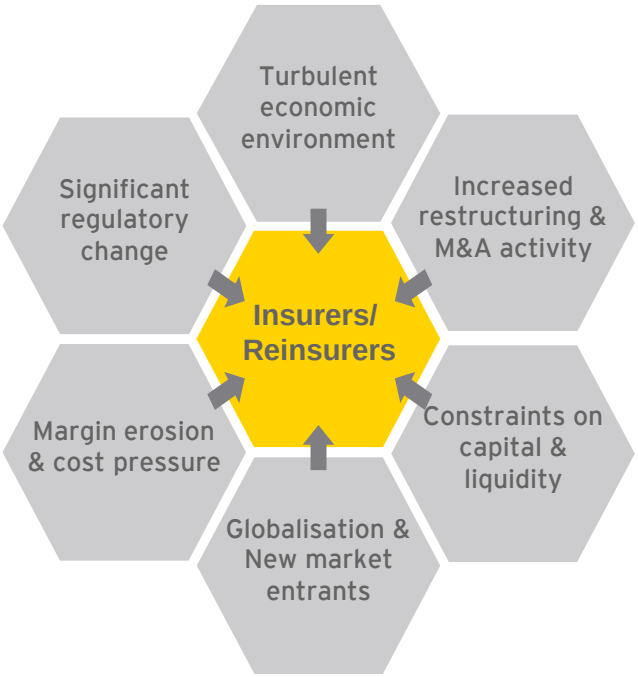
Today's environment is putting the role of actuaries under immense pressure…

1

Increased reporting and regulatory requirements (SII, own solvency models, IFRS, local GAAP, IDD,...) on top of existing workflow. In response to cost pressures, strained teams have absorbed this with existing resources

2

Pressure for speed and insight is also placing pressure on infrastructure, process and data quality and management



3

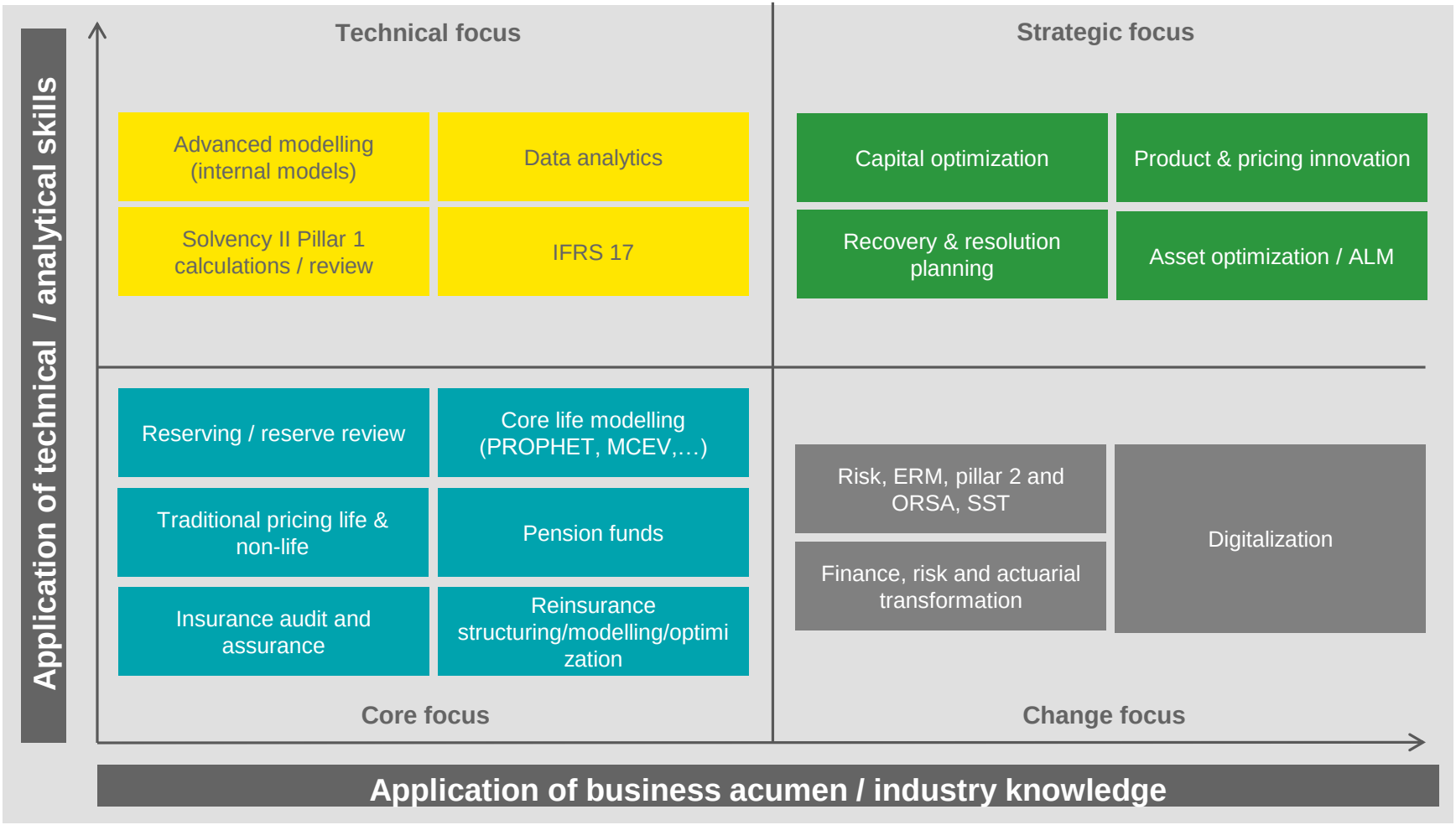
Post merger integration is time consuming and expensive

4

Legacy systems and dated infrastructure after a period of no or not targeted investment is often straining actuarial performance

In today's market environment, pressures on the Actuarial Function are increasing and becoming more complex

… and actuaries have adapted to some of these pressures



Four main drivers of change in the role of actuaries

The imperatives for actuaries are clear – protecting & supporting the business, providing increasing information to the business, as well as reducing their costs and adjusting from the current "silo" mind-set many actuarial functions have.

1	**Solvency II – risk management, actuarial function**	**Supporting the CRO:** Robust independent challenge on technical provisions; risk-based, intelligent and efficient controls to ensure overall protection and support in change management.
2	**IFRS 17**	**Supporting the CFO:** IFRS preparation requires closer integration of Actuarial, Finance and Risk to leverage on shared data sources and reporting processes.
3	**Data and Analytics**	**Supporting the CEO:** Leading analytics to support optimization of underwriting, pricing, ALM reinsurance, M&A, business intelligence and reporting
4	**Digital and Emerging Tech**	**Supporting integration of actuarial, finance and risk:** Addressing business transformation via emerging technologies such as UBI, robotics, blockchain

New challenges

What did Solvency II bring?

1 Solvency II – risk management, actuarial function

1	Best estimate and risk margin calculation (Solvency II technical provisions, TPs)
2	SCR calculation: life and non-life underwriting risk, market risk, CDR, operational risk, LAC TP, LAC DT
3	Risk management and ORSA: IMMMR process, capital planning, stress & scenario testing
4	Internal models: risks calibrations (life, non-life), stochastic modelling, model validations
5	Actuarial function: fit & proper, actuarial function report, also opinion on underwriting & reinsurance in addition to SII TPs

The IFRS 17 standard in a page: key aspects

Premium Allocation Approach ("PAA")

- Simplified measurement approach for short-duration contracts with coverage period up to one year or if reasonable approximation of BBA
- Expected to apply to many P&C/ non-life insurance contracts

Variable Fee Approach

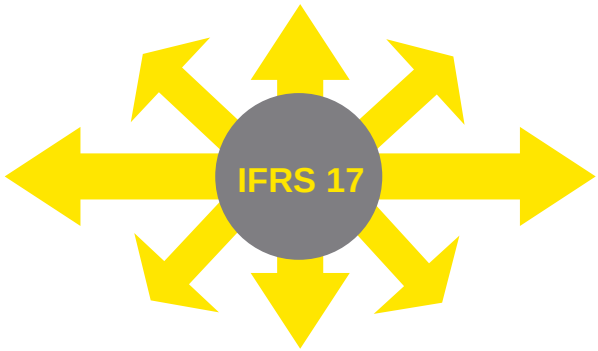
- For insurance contracts which give policyholders a right to participate in results of underlying assets, the BBA is amended
- CSM is unlocked for changes in financial variables (including cost of options and guarantees), discount rate reflects asset dependendency of cash flows

Building Block Approach ("BBA")

- Main measurement model for insurance contracts.
- Obligation measured using discounted probability weighted estimate of future cash flows plus a risk adjustment representing the cost of variability in cash flows plus a contractual service margin

Leverage on Solvency II

- Similar concepts around Best Estimate Liability and Risk Margin resulting in scope for considerable operational synergies
- Significant differences of detail exist eg. Expense allocation, IFRS focus on P&L measurement, Solvency II more prescriptive, different scope of proposals, Solvency II has no CSM, unbundling, risk margin on ceded business is different, etc



Contractual service margin ("CSM")

- Explict margin representing the profit on a block of contracts that is amortised over the service period
- Unlocked for the impact of changes in future cash flows and risk adjustment that relate to service to be provided in future periods

Interaction with IFRS 9

- Insurers may be able to adopt IFRS 9 and IFRS 17 together
- Recognition of impacts of changes in market interest rates on insurance contract liabilities to match with measurement options taken under IFRS 9

Unit of account for CSM and onerous contract test

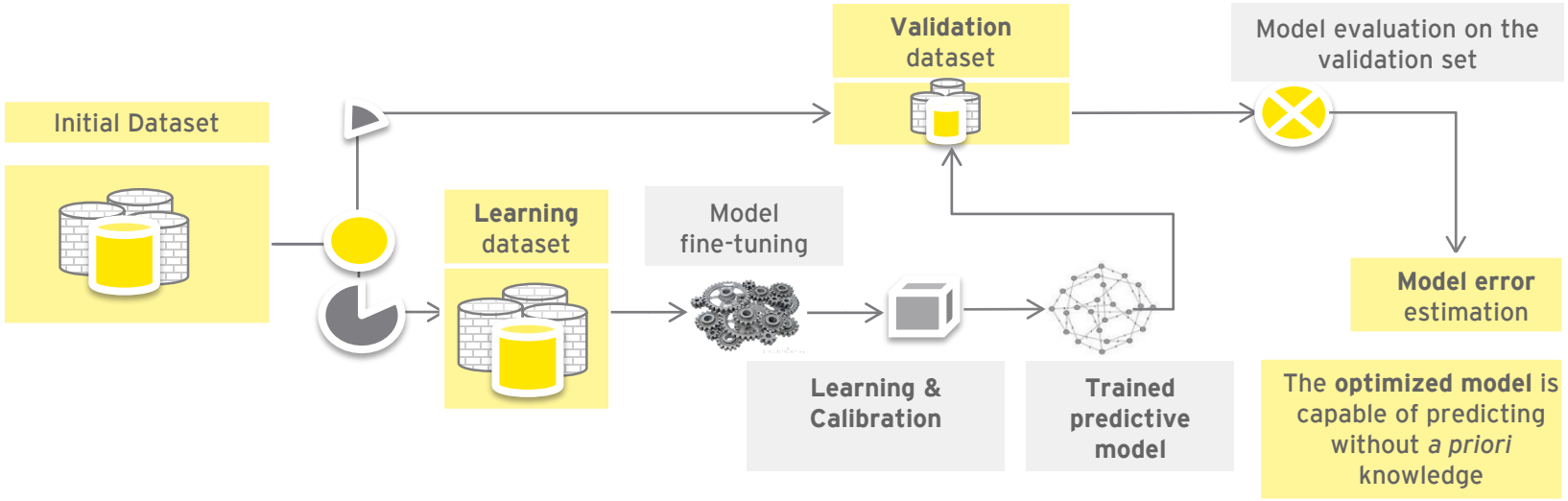
- Group contracts by product type and year of issue.
- Then split into onerous contrats, contracts with no significant risk of becoming onerous, and the rest

Discount rate

- Reflects characteristics of the cash flows of the insurance liability – market rates should be adjusted to be consistent with cash flows (eg. to refelect currency and liquidity)
- Top-down versus bottom-up approach

Data analytics: use statistical methods and tools to generate intelligent insights that drive better decisions

The data analytics models are built through supervised learning based algorithms

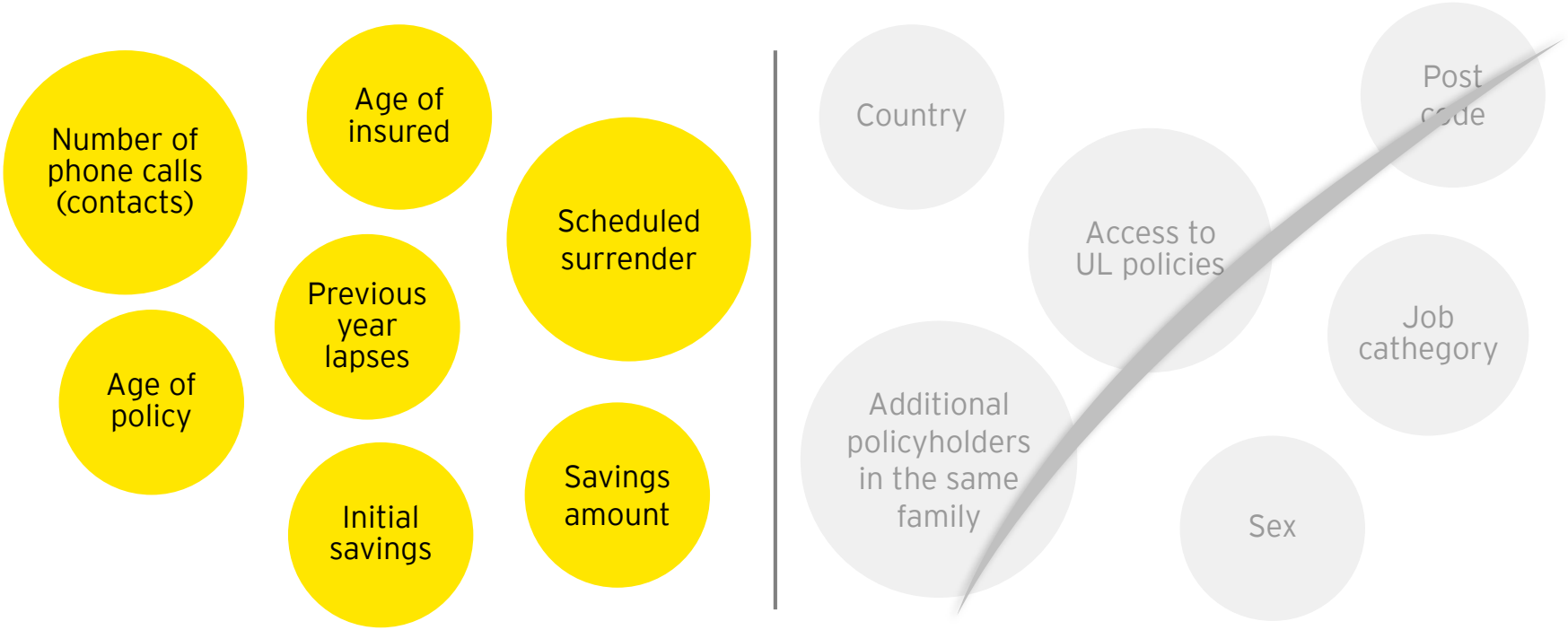


Example processes where actuarial skills might be used for data analytics

- Claims handling optimization
- Fraud detection
- Pricing
- Retention improvement
- Cross selling / upselling
- Channel mix

Data analytics example: lapse profiling (1/2)

Some features are correlated with lapse behaviours, while others are not



We used this to build our predictive model

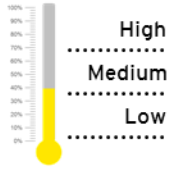
BUT

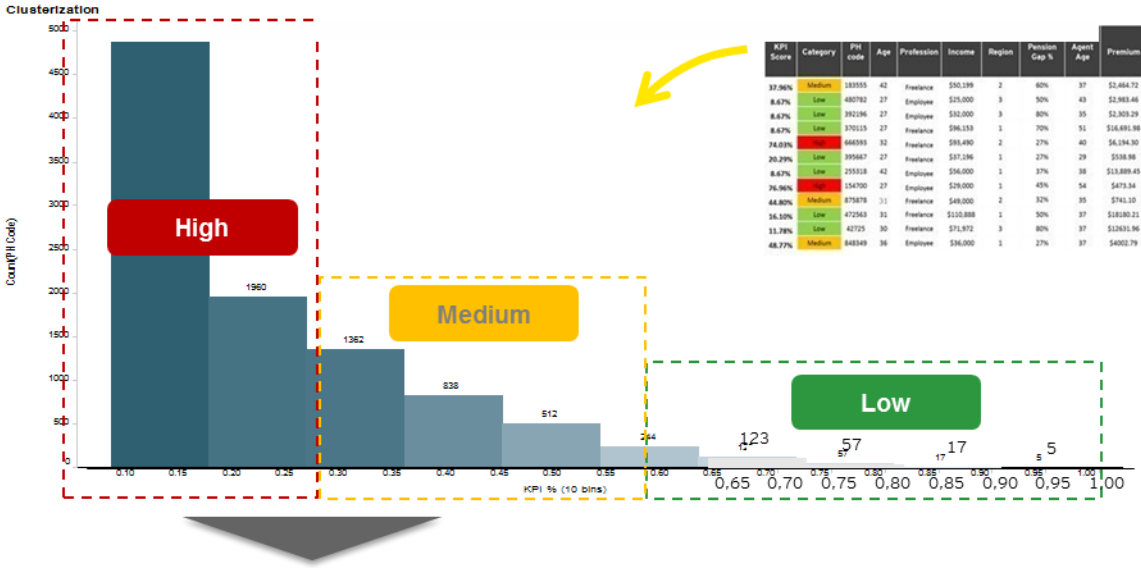
We did not create a model *explaining* why policies are lapsed or not, we just found a way to **predict such lapsing behaviours**

Data analytics example: lapse profiling (2/2)

Scoring System

A **scoring system** is designed to assign the predicted propensity of **Customer behavior** (e.g. lapses, paid-ip, fraud)





KPI Score	Category	PH code	Age	Profession	Income	Region	Pension Gap %	Agent Age	Premium	Time to Pension	Asset Allocation	Premium Frequ
37.96%	Medium	183555	42	Freelance	$50,199	2	60%	37	$2,464.72	20	Bond	12
8.67%	Low	480782	27	Employee	$25,000	3	50%	43	$2,983.46	35	Equity	12
8.67%	Low	392196	27	Employee	$32,000	3	80%	35	$2,303.29	35	Equity	12
8.67%	Low	370115	27	Freelance	$96,153	1	70%	51	$16,691.98	35	Equity	4
74.03%	High	666593	32	Freelance	$93,490	2	27%	40	$6,194.30	30	Mixed	12
20.29%	Low	395667	27	Freelance	$37,196	1	27%	29	$538.98	35	Mixed	12
8.67%	Low	255318	42	Employee	$56,000	1	37%	38	$13,889.45	20	Bond	4
76.96%	High	154700	27	Employee	$29,000	1	45%	54	$473.34	35	Mixed	4
44.80%	Medium	875878	31	Freelance	$49,000	2	32%	35	$741.10	31	Bond	12
16.10%	Low	472563	31	Freelance	$110,888	1	50%	37	$18180.21	31	Equity	4
11.78%	Low	42725	30	Freelance	$71,972	3	80%	37	$12631.96	32	Equity	4
48.77%	Medium	848349	36	Employee	$36,000	1	27%	37	$4002.79	26	Mixed	12

Desired Customer Profile

Socio-demographic variables & financial behavioral traits are used to **profile the customer**

- Freelance
- Direct Debit Payment
- Region XXX

Targeted Marketing Actions

InsurTech: UBI – new data sources are a game-changer in insurance for innovation (1/2): telematics, smart homes, wearables

Usage Based Insurance is a concept, which uses personal, individual data to personalise the customer offering.

UBI products are used for different type of coverages. The data points and models are quite different in these main domains, but data is the key to all of them:

- Property & Casualty for Cars

- Property & Casualty for Houses

- Life and Health Insurance - wearables

Since UBI propositions generate significantly more data to conventional products, UBI products will require actuarial process to move from classic statistical analysis using static models to predictive analytics using dynamic and non-linear models.

InsurTech: UBI – new data sources are a game-changer in insurance for innovation (2/2): telematics for cars

The true drivers of risk

- **The car**
  - Age of the car
  - Condition of the car
  - Make and model of the car
- **The driver**
  - Age of the driver
  - Experience of the driver
  - Any impairments of the driver
- **Where the car is driven**
  - Traffic density
  - Type of road
  - Traffic enforcement (e.g. Speed cameras)
- **When the car is driven**
  - Day or night
  - Weather conditions
  - Seasonal use only
- **How the car is driven**
  - General adherence to laws & regulation
  - Length of journeys
  - Acceleration, deceleration and speed of car on different road types / traffic density

Traditional insurance

- Currently insurers use the following proxy factors to describe the true risks :
- **Car factors**
  - Age of car
  - Vehicle value
  - Vehicle group
- **Driver factors**
  - Age of the driver
  - Claims history
- **Other**
  - Socio demographic
  - Geographical

Telematics data

- The majority of the true drivers of risk are only available using telematics information
- **Car and driver factors** as per traditional insurance
- **How the car is driven**
  - General adherence to laws & regulation
  - Length of journeys
  - Acceleration, deceleration and speed of car on different road types / traffic density
- **Where the car is driven**
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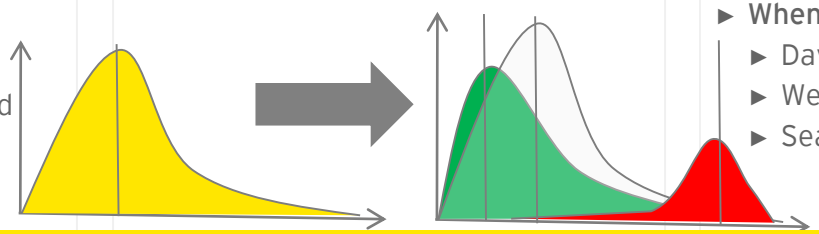

Proxy factors result in traditional pricing model (yellow) being skewed by the smaller, bad driving, population. Telematics information can isolate these bad drivers (red) and help insurers to offer cheaper prices to the majority of customers (green)

Q&A

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