



Pricing of Legal Insurance An Actuary's Perspective

Portfoliomanagement & Aktuariat,
Webinar,

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ROLAND Sicher im Recht.

Main topics for today



Technical Pricing

- ✓ Tariff pricing
- ✓ Segmentation
- ✓ Risk modelling



Pricing Strategies

- ✓ Competitive position
- ✓ Market Transparency
- ✓ Smart Data



Customers' buying behavior

- ✓ Human Brain and decision-making process
- ✓ Various theories



Technical pricing

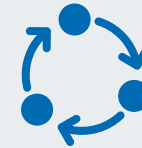
Legal Protection Insurance

Characteristics of a Property and Casualty Insurance

SHORT CONTRACTS



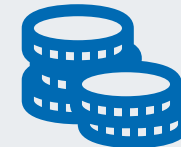
3 RISK DIMENSIONS: OCCURRENCE, COST, TIME



LATE LOSSES (IBNR)

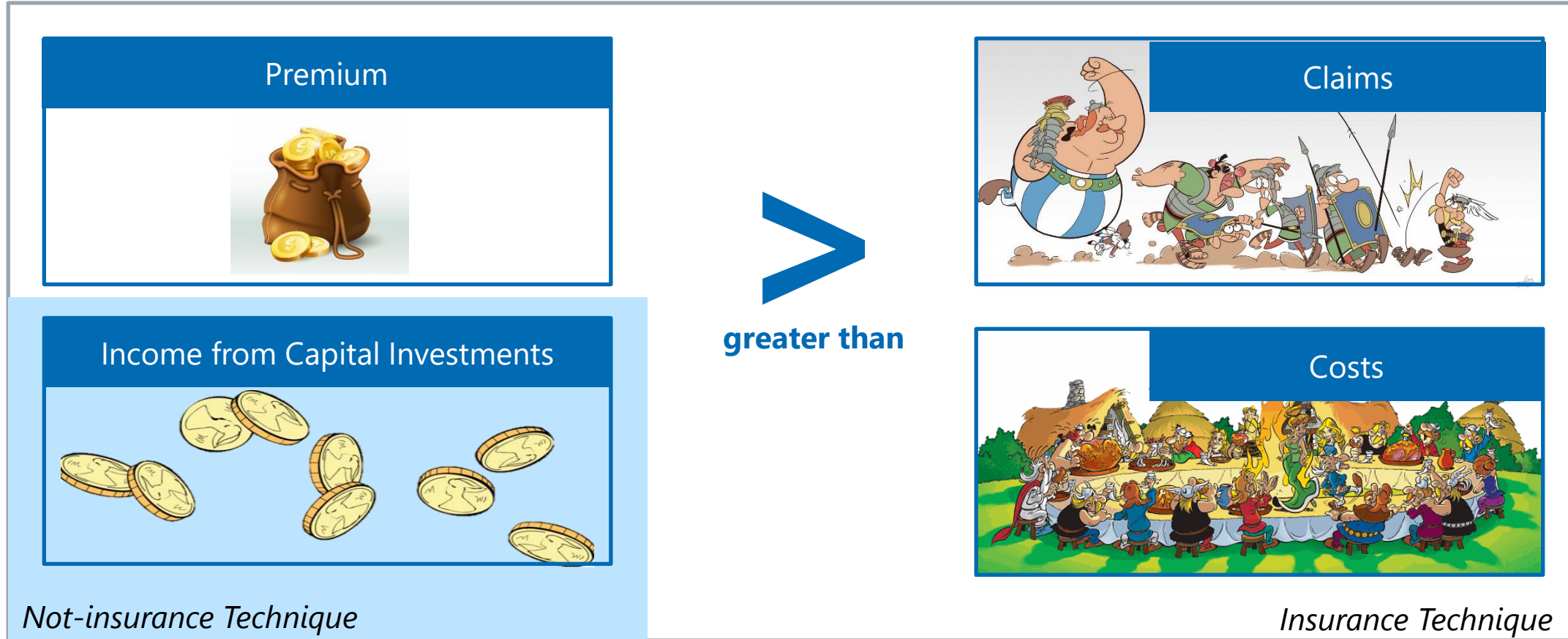


PREMIUM ADJUSTMENTS WITH YEARS



How do Insurers make Money?

Characteristics of the Property and Casualty Branch

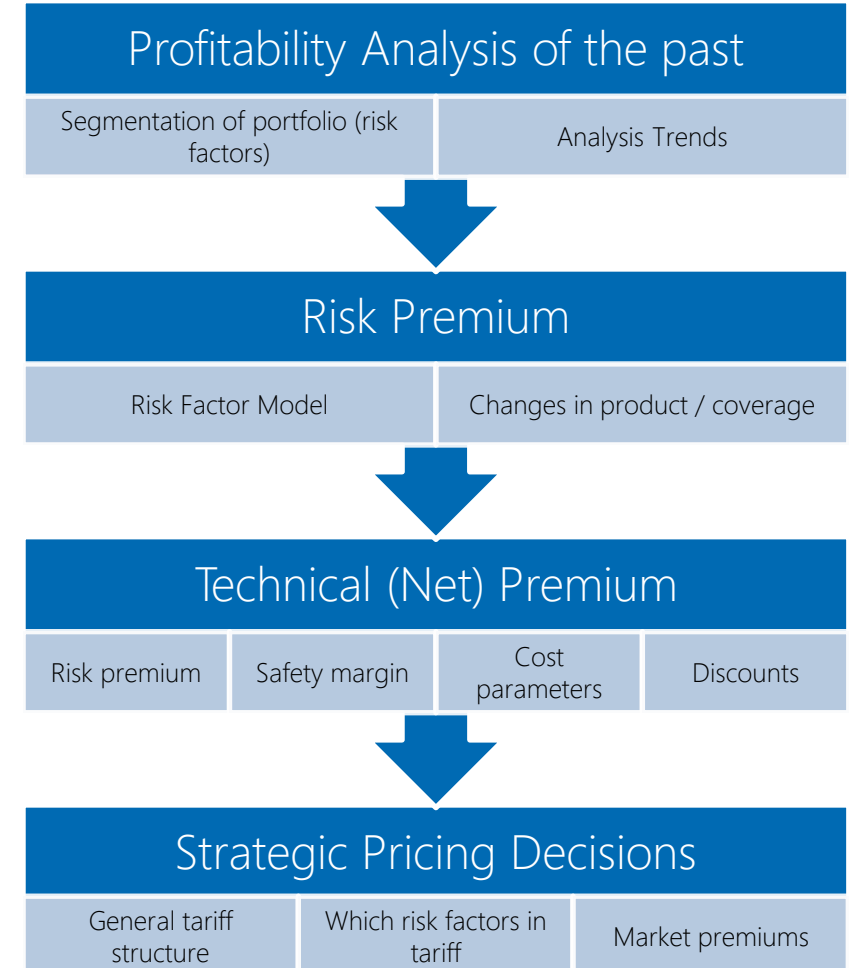
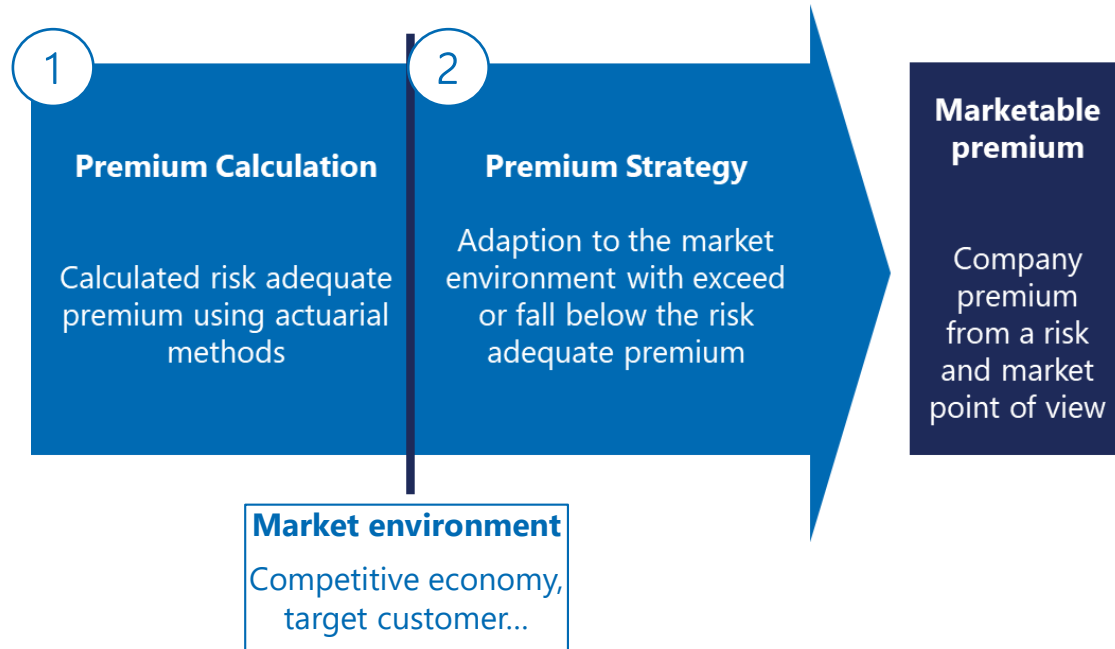


In the medium-/long-term average insurance technique and non-insurance technique should be profitable

Tariff Pricing

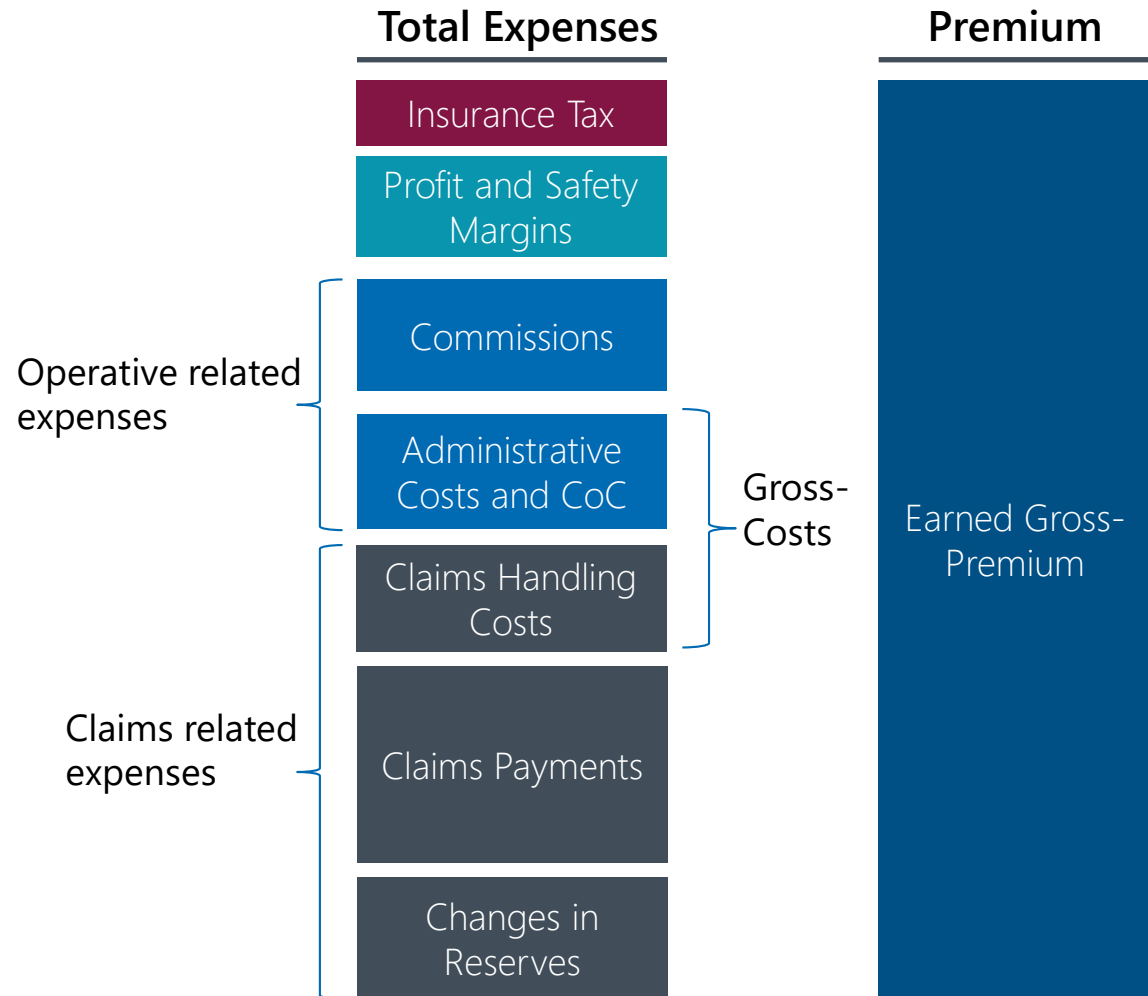
Pricing policy is a combination between calculation, strategy and marketing

The calculation of the risk adequate premium should be the first step. So strategic considerations can be quantified afterwards.



Elements of a Risk Adequate Premium

How to ensure profitability?



A risk adequate premium should reflect the principle of equivalency:

Expected Present Value of Premium

=

Expected Present Value of future Claims Costs

+ Expected Present Value of Expenses

+ Contribution to Profit

The Importance of Price Differentiation

Information Asymmetry and Market Mechanisms

“The Market for Lemons: Quality Uncertainty and the Market Mechanism” 1970 paper by economist George Akerlof:

Information asymmetry between buyers and sellers creates an **adverse selection** problem that drives the high-quality goods from the market. Adverse selection is a market mechanism that can lead to a market collapse.

Underwriting process is meant to reduce information asymmetry between insurance and insured

What features are risk relevant?



Calculation of the Risk Premium

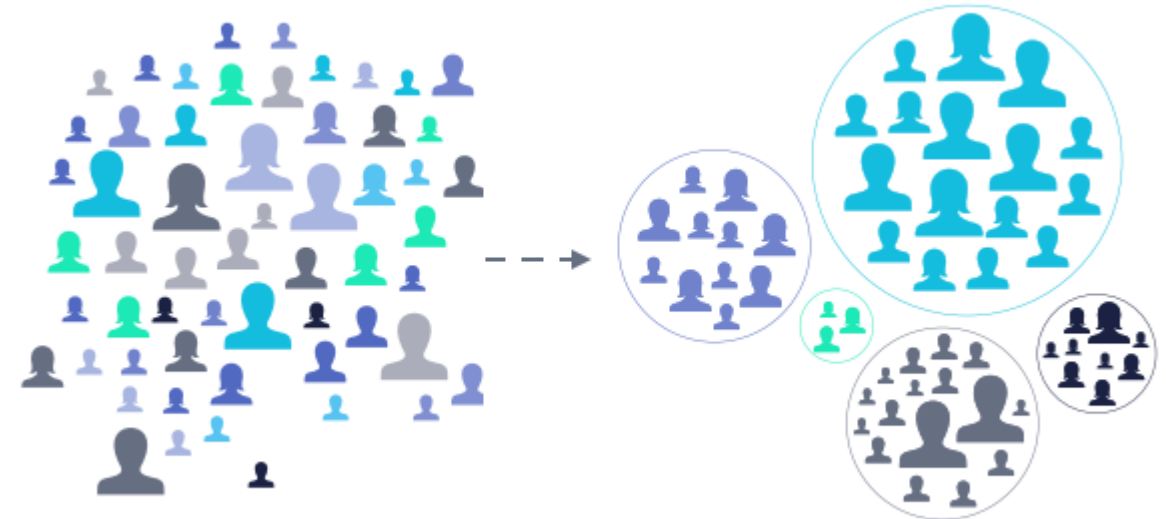
Risk Pooling vs Risk Segmentation

Insurers **pool similar risks** together in order to differentiate singular losses

Challenge: Define scientific pricing criteria in order to identify segments across which the insured risk will spread similarly

Balancing the spread of risk against adverse selection

- Division of the portfolio into **few big segments**:
 - Less complex with low differentiation of risk and premium
 - Good spread of risks in each segment
 - Risk adverse selection if the segments are not enough homogeneous
- Division of the portfolio into **many small segments**:
 - More complex with high differentiation of risks and premiums
 - Poor spread of risk in each segment
 - Unfair for some customer



Differentiation and segmentation could be tools to develop innovative selling strategies different from the market. -> first mover

Risk Modelling & Risk Factors

What is the difference between risks?

Motor Third Party Liability Insurance



- Nr. of Drivers
- Vehicle Class
- Driver's Experience
- Claim History
- Funding
- Parking
- Occupation
- Insured's Age
- ZIP
- Car's Age

...

=> Extreme Price Differentiation

Private Legal Protection Insurance



Family Status

Working Status

Could it be enough?

=> Poor Price Differentiation

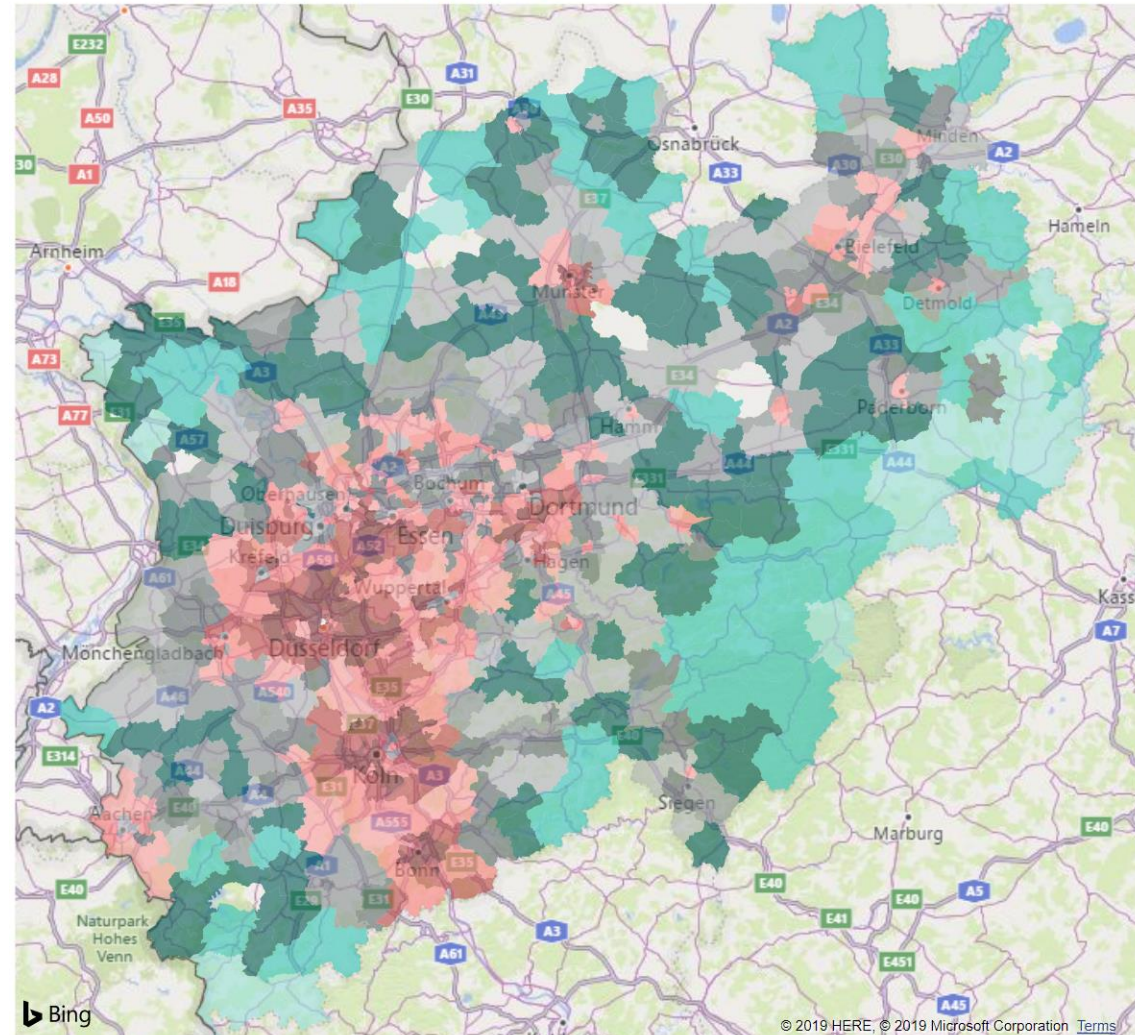
Discovering new Pricing Factors

Example: Geographical clusters for private LEI

- Significant variability in claim frequency and claim severity across geographical clusters
- City districts represent a good proxy of the socio-economical clusters of the population living in it
- Demographical factors tend to vary a lot across cities and countryside

Risikoklasseneinteilung

Risikoklasse 1 2 3 4 5 6 7 8 9 10



BUNDESLAND

Nordrhein-Westfalen

Produktgruppe

- P
- PB
- PBI
- PBV
- PBVI

SB_STUFE

150,00

SB_ART

feste SB

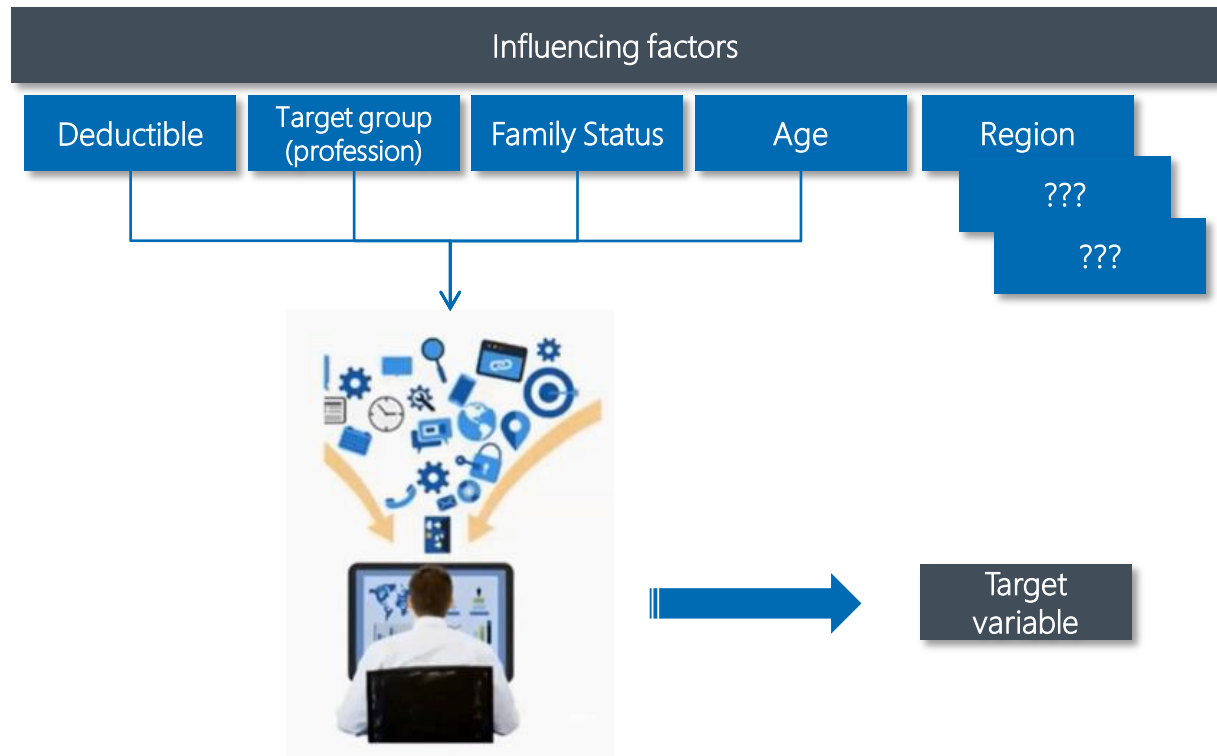
VERTRIEBSWEG_INTERN

Alle

Risikoklasse	Schadenquote	Bestandsverteilung	
1	68,61	0,81%	low
2	-x %pts	4,85%	
3	7,10	8,42%	
4	82,72	0,04%	middle
5	81,17	12,18%	
6	84,68	13,11%	
7	82,22	11,39%	
8	83,40	14,43%	high
9	+y %pts	14,52%	
10		12,20%	

A model must capture the most important features of the actual situation

A predictive model estimates a target variable based on the influencing factors.
In the context of pricing calculation, the target variable could be the risk premium or other KPI (claim frequency or claim size)



Tasks:

- Identification of the influencing factors (risk characteristics)
 - How? Graphical analysis, supervised and unsupervised learning
- Development and optimization of the estimation model
 - How? Model choice, variables regression, model fitting
- Test and validation of the estimation model
 - How? Training vs test data, cross-validation

Examples:

- Risk premium
 - Claims frequency
 - Claims size
- But also ...
- Probability of churn
 - Elasticity of demand



Pricing Strategies

Pricing Strategies

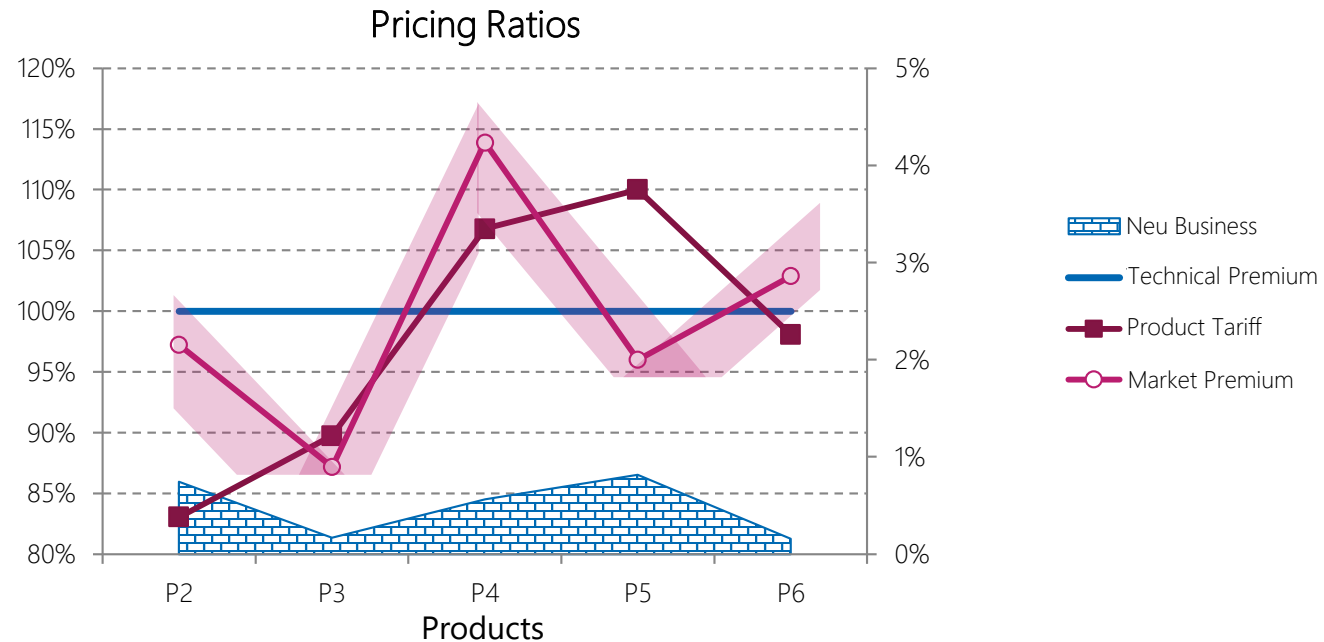
Final Premium adjusted according to the Market Environment and Company Strategy

✓ Final premium below the technical premium:

- New market entry
- Loss-leading
- Cross-subsidization
- Strong competition
- Predatory pricing

✓ Final premium above the technical premium:

- Product uniqueness and high complexity
- Low competition
- Captive market or dominant position



An accurate pricing strategy is possible only with a deep knowledge of its own product portfolio and a good degree of market transparency

Industry analysis as well as collective industry data could help to define its own market positioning

Optimization of strategical Price Positioning

Price positioning using the deviations of actual premium and market premium from technical premium

Example 1 :

- Current premium clearly above technical premium (very profitable)
- High production, i.e. high freedom in price charging !?
- Current premium clearly above market price levels

⇒ Need to adjust the price positioning?

Example 2 :

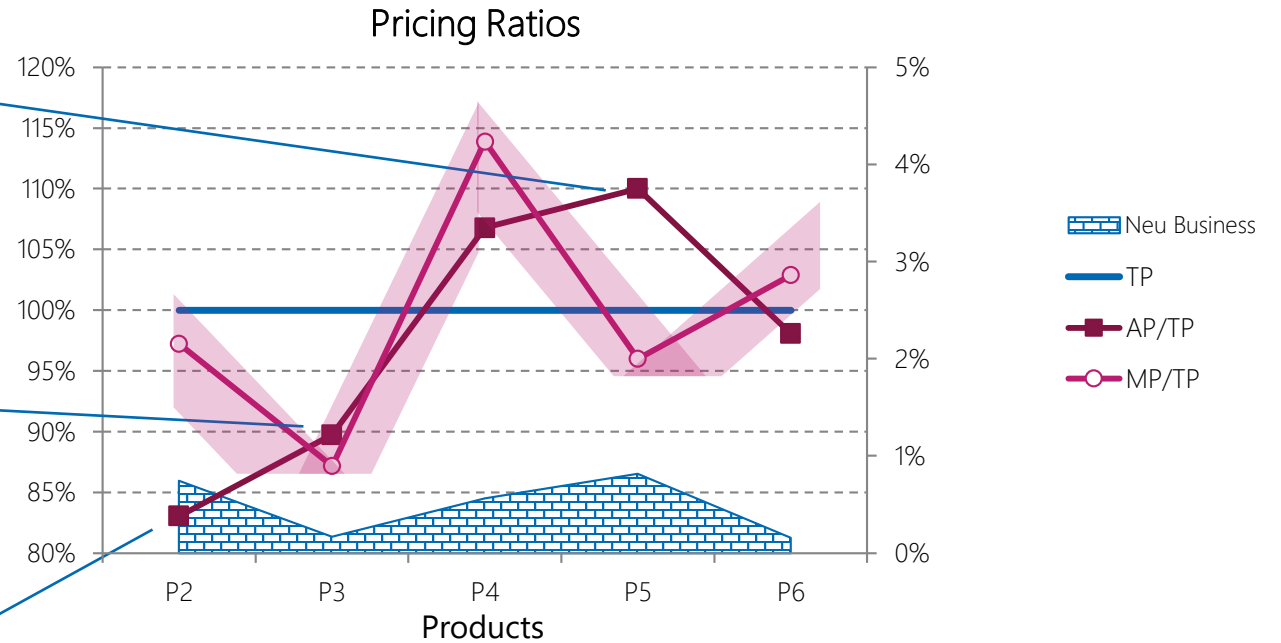
- Current premium well below technical premium (not sufficient, technical loss)
- Current premium slightly above the market price level

⇒ No better price positioning possible, eliminate product if necessary?

Example 3 :

- Current premium well below technical premium (not sufficient, technical loss)
- Market price level well above the current price level, only just below the technical premium

⇒ Higher, almost adequate price positioning possible



Legend

AP: Current (Actual) Premium = Tariff premium (price fixing for new tariff)

TP = Technical Premium = Minimum / or needed premium

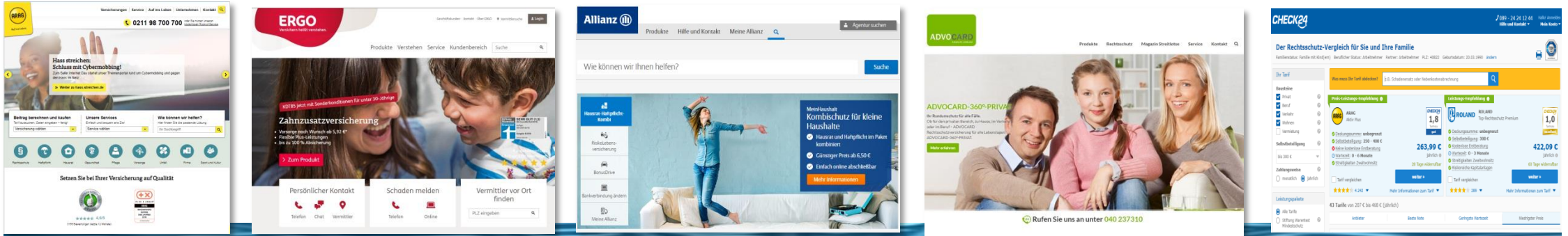
MP = Market Premium or market premium level

AP / TP = deviation of the current premium from technical premium

MP / TP = Deviation of market premium from technical premium

Market Transparency

What does the competition do?



The digital market is a source of fresh information and allows to constantly observe competitors move

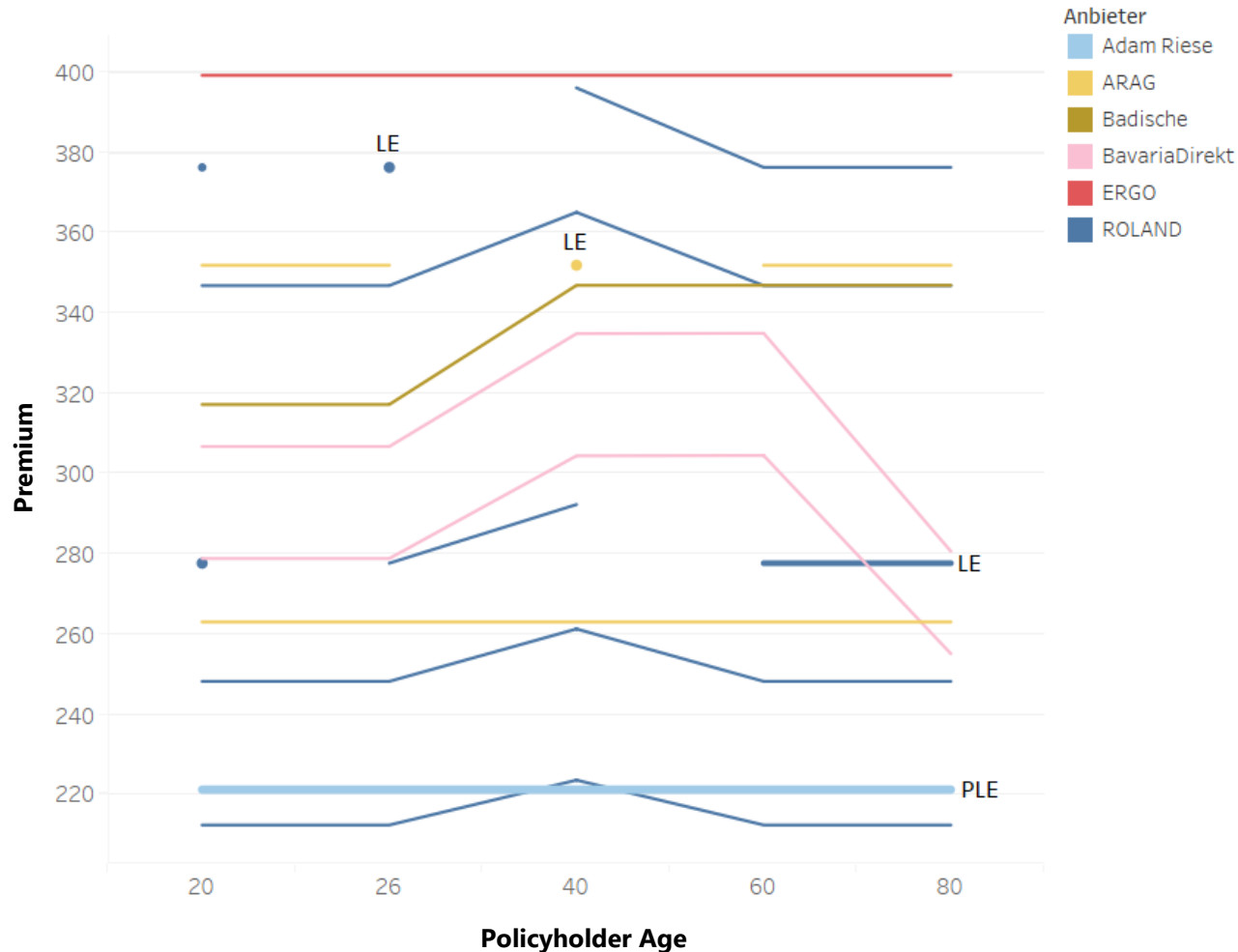
Understanding pricing and tariff factors of competitors allows to...

... recognise quickly potential need of price and tariff changes

... obtain a picture of the company's position in the market and adapt its strategy

Aggregator Websites affect Price and Business Strategies

What Pricing factors are relevant for the Market?



- Different degree of price segmentation across different competitors
- Exploit price rigidity in the market to improve products competitive position and attract customers segments that represent better risks
- Reduce exposure to unprofitable customers clusters
- Reduce adverse selection
- Optimise the cross subsidisation among segments and products



Customer's buying behaviour

Consumer Buying Behaviour and Willingness to Pay

Focus on the customers' behavior to predict better the expectations and implement an effective pricing strategy

Various psychological effects

1. Decoy effect (partial comparability)
2. Converge to the middle option (compromise effect)
3. Reference price (bargain hunter effect)
4. Opt-out vs opt-in
5. Irrational Value assessment (Value effect)
6. Left-hand number focus
7. Decision paralysis



1. Decoy Effect (partial comparability)

The introduction of a third option influences the final decision

Example from "Predictably Irrational" of Dan Ariely:

1

The Economist

a. \$56 for online subscription

b. \$125 for online + print

2

The Economist

a. \$56 for online subscription

b. \$125 for online + print

c. \$125 for print only **NEW!**



In the first scenario with two options, the customers had nothing to compare either option to. But with the introduction of the third option, option #b and #c are comparable and #b wins hands down (getting online version for free after all!). Option #a has no comparable so it gets left out.

2. Convergence to the middle (compromise effect)

The middle option is often considered to be the most attractive ones

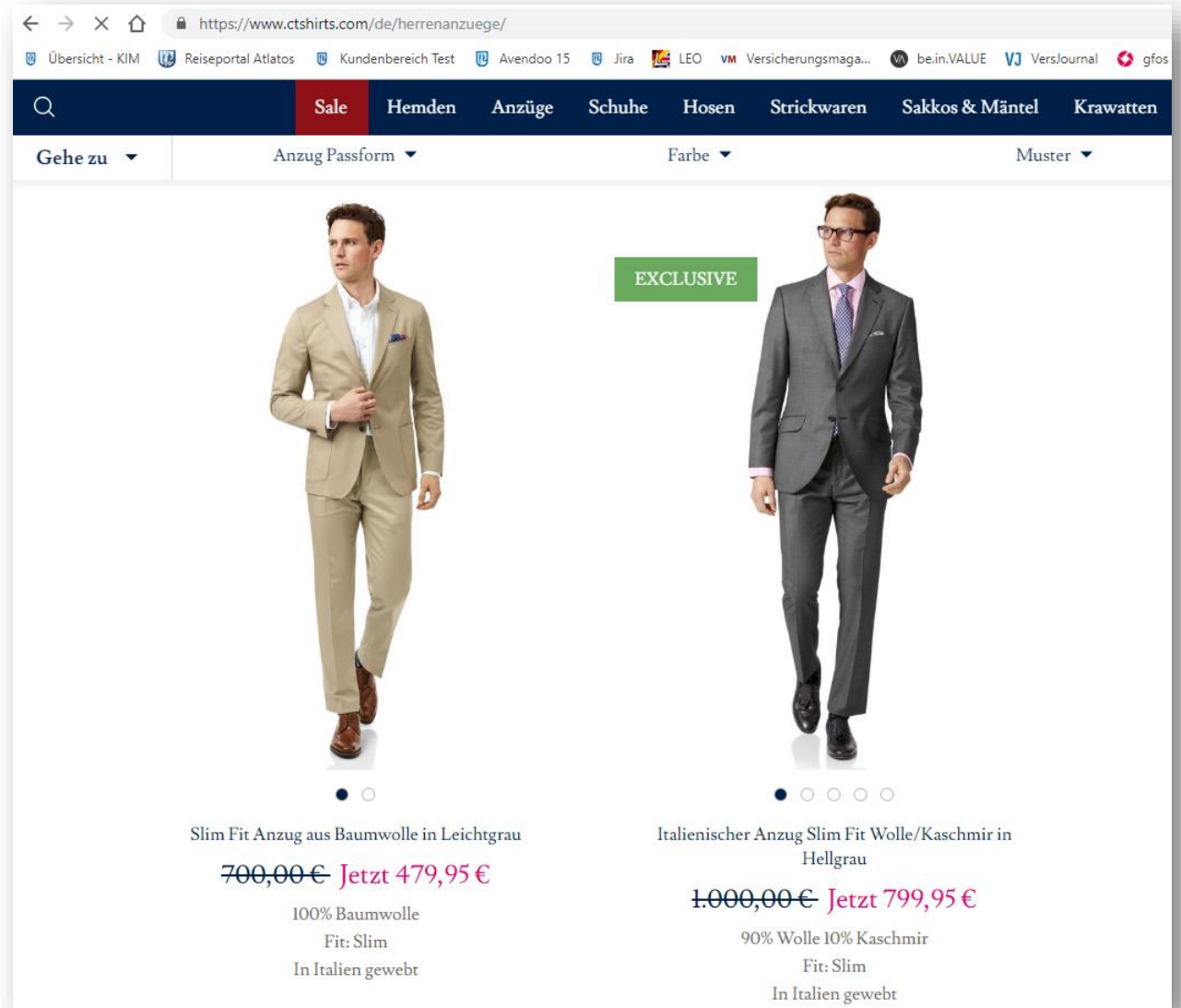


- The customer tends towards the middle
- Easy to understand even without detailed product knowledge (both by the sales partner and by the customer) and therefore easy to orientate towards the type of customer

3. Reference price (bargain hunter effect)

Show a product with fancy price discounted

- The fantasy price sets a price anchor and thereby influences the customer's perception of value
- In this case, the customer is more willing to buy for € 479 than without this reference price



The screenshot shows a web browser window with the URL <https://www.ctshirts.com/de/herrenanzuege/>. The navigation bar includes a search icon, a 'Sale' button, and menu items for 'Hemden', 'Anzüge', 'Schuhe', 'Hosen', 'Strickwaren', 'Sakkos & Mäntel', and 'Krawatten'. Below the navigation bar are filters for 'Gehe zu', 'Anzug Passform', 'Farbe', and 'Muster'. Two suits are displayed side-by-side. The left suit is a light grey suit with a price tag showing a crossed-out '700,00 €' and a current price of 'Jetzt 479,95 €'. Below it, the text reads: 'Slim Fit Anzug aus Baumwolle in Leichtgrau', '100% Baumwolle', 'Fit: Slim', and 'In Italien gewebt'. The right suit is a dark grey suit with a green 'EXCLUSIVE' badge above it. Its price tag shows a crossed-out '1.000,00 €' and a current price of 'Jetzt 799,95 €'. Below it, the text reads: 'Italienischer Anzug Slim Fit Wolle/Kaschmir in Hellgrau', '90% Wolle 10% Kaschmir', 'Fit: Slim', and 'In Italien gewebt'.

4. Opt-out vs opt-in

Deselecting from the full product achieves higher prices than adding to the basic product

Schließen

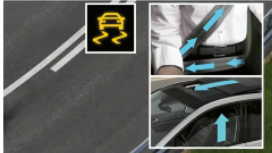
Wählen Sie Ihre Sonderausstattung

Nach spezifischer Ausstattung suchen

Klimaanlage, GPS, ...

Airbags

Proaktives Insassenschutzsystem inkl. Seitenairbags hinten¹
[Details](#)



3,95 €/ Monat^{14, 15}
oder Preis inkl. MwSt. 530,00 €⁴


Anhängervorrichtungen

Anhängervorrichtung anklappbar, mit elektrischer Entriegelung

6,56 €/ Monat^{14, 15}
oder Preis inkl. MwSt. 880,00 €⁴

Anzeigen und Displays

Head-up-Display





5,22 €/ Monat^{14, 15}
oder Preis inkl. MwSt. 700,00 €⁴

KONFIGURATOR

Preis inkl. MwSt. 37.355,00 €¹
Preis inkl. MwSt. 2.265,00 €¹
Preis inkl. MwSt. 39.620,00 €¹

Felgen:



Zubehör und Laden →

[Serienausstattung](#)

- Customers who deselect certain modules from a complete product end up with higher prices than customers who select individual modules starting from the basic product

5. Irrational Value Assessment (Value effect)

In which environment would you be more willing to pay a higher price?

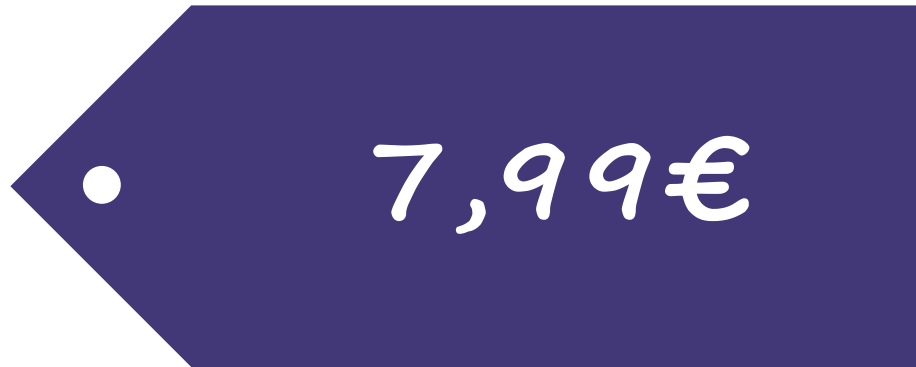


Wine taste showed clear correlation between rating of the wine and price tag.

- The willingness to pay is higher through a high-quality, appealing, confidence-inspiring environment
- There are also differences in the presentation in an online environment or in sales brochures

6. Left-hand number focus

Most people read / perceive numbers from left to right



- By focusing on the first number on the left, the price of € 7.99 is perceived as significantly more attractive than the barely higher price of € 8.05
- This Psychological effect is used everywhere (gasoline price, chocolate, ...)

7. Decision paralysis

Reducing the number of options available, tends to increase sales



- When faced with too many options, customers are unable to evaluate them all, and end up deciding not to buy at all



Thank you very much!