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Survey-based insights from choice-based conjoint analyses on customer preferences for company characteristics of life insurers

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Abstract

The aim of this paper is to investigate customer preferences for certain company characteristics when purchasing life insurance products. We focus on ratings provided by aggregators, namely financial strength, sustainability, service quality, and type of customer touchpoint (online vs. in person), while also studying potential product-specific differences between annuities and term life policies. Toward this end, we conduct two choice-based conjoint analyses with 529 and 543 German respondents to estimate individual preference structures. Consistent with economic expectations, we observe statistically significant higher preferences for better ratings of the life insurer, which also materialize in the respondents' marginal willingness to pay. One main finding is that customer preferences in our sample are asymmetric, with a strong focus on avoiding belowaverage ratings. Furthermore, for both annuities and term life insurances, the relatively most important life insurer attribute for customers is financial strength, followed by service quality, sustainability, and type of customer touchpoint.

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1 | INTRODUCTION

Various regulatory frameworks aim to increase transparency in the European insurance sector for customers, particularly with respect to financial strength or sustainability, like pillar three of Solvency II or the Sustainable Finance Disclosure Regulation. Next to financial strength and sustainability, online aggregators provide additional information about insurers regarding their service quality and customer touchpoint (online vs. in-person contact). This makes it easier for customers to take various factors into account when making purchase decisions for specific insurance products, which may go beyond the product's net present value. Especially in life insurance, where contracts run for longer time periods and premium volumes are higher, more emphasis might be placed on choosing the "right" insurer. Moreover, customers might weight life insurer attributes differently depending on the business line, as their purchase intentions may depend on the respective life insurance product (e.g., annuity vs. term life insurance).

Many research papers have shown that characteristics of customers (e.g., demographic or economic factors) can influence their purchase behavior for life insurance products (see Zietz, 2003). At the same time, regression analyses based on real market data indicate that also company characteristics of life insurers provide value to customers and might explain price differences (see Pritchett & Wilder, 1977; Walden, 1985). Survey-based and experimental research that directly analyzes customer preferences in the life insurance sector, however, mostly focuses on the perspective of a single life insurance product and the product's (rather than the insurer's) attributes (see, e.g., Braun et al., 2016; Fuino et al., 2020; Lee et al., 2019; Shu et al., 2016). In particular, the role of a life insurer's sustainability or service quality rating in customers' purchase behavior is widely unresearched. Therefore, we aim to fill this gap and study customer preferences for an insurer's financial strength, sustainability, and service quality rating as well as the type of customer touchpoint (online vs. in person) when purchasing annuities and term life insurances. We gain new insights into the product-specific relevance of life insurer attributes for customers, which could be used, for example, for more effective and product-specific marketing strategies.

In the context of sustainable and responsible investments, previous research finds that sustainability features may create additional value for financial products by increasing the demand or willingness to pay (WTP) of private investors (see, e.g., Gutsche & Ziegler, 2019; Lagerkvist et al., 2020; Rossi et al., 2019). In the insurance sector, the impact of sustainability features on customers is still only rarely researched. Lee et al. (2017) observe for the Taiwanese nonlife insurance market that active engagement in corporate social responsible activities leads to better corporate reputation, customer loyalty and satisfaction, which also applies for the Taiwanese life insurance market (see Hsu, 2012; Lee, 2019). In a unit-linked life insurance product context, Gatzert and Kraus (2024) find-based on choice-based conjoint (CBC) analyses—that while private investors value sustainable product attributes in the underlying funds, risk-return indicators and ongoing costs are more relevant. Experimental research by Jahnert et al. (2022) indicates that sustainability attributes of rental insurance products increase an insurer's brand equity, which in turn increases customers' purchase intension. While these papers demonstrate the relevance of sustainability features for policyholders, they do not investigate the role of a life insurer's sustainability rating, particularly in relation to other life insurer attributes.

The impact of a (nonlife) insurer's financial strength on premium growth has been analyzed extensively in the literature (see Eling & Schmit, 2012; Epermanis & Harrington, 2006; Escudero & Ruiz, 2022; Sommer, 1996). Most of this research is motivated by the idea of market

discipline, that is, customers' ability to monitor and influence the management of insurers, showing that premium growth is positively related to insurers' financial strength (see Eling, 2012). One explanation for this observation could be the link between financial strength and the insurers' financial performance, whereby in many countries (e.g., in Germany) policyholders are directly participated in life insurers' generated surplus (see Eling & Kiesenbauer, 2012). Another explanation could be customers' missing awareness for installed guaranty funds (see Grace et al., 2019; Li et al., 2021; Searle et al., 2024) along with customers' strong aversion to insurance products with a reported default probability, as illustrated by many experiments (see, e.g., Gatzert & Hanika, 2023; Wakker et al., 1997; Zimmer et al., 2018). For example, Gatzert and Hanika (2023) conduct two CBC analyses, observing a sharp decline in policyholders' WTP for annuities and term life insurances depending on a numerically framed reported default probability. In a more realistic setting,¹ Shu et al. (2016) include the life insurer's financial ratings AA or AAA (among other attributes) in a CBC analysis about customer preferences for annuities, similar to Lee et al. (2019) using the ratings A, AA, or AAA. They find a weak or mixed relevance of the ratings, but mainly focus on product attributes and do not consider other attributes of the life insurer.

The perceived value of service quality is directly linked to customers' behavioral consequences, like the propensity to switch a provider or the willingness to pay more for a given service, which is particularly important for insurance companies as pure-service providers (see Zeithaml et al., 1996). Since better service quality can lead to more satisfied customers, the positive impact on insurers' financial outcomes is most often explained by reduced marketing expenses due to customers' higher loyalty or WTP (see Pooser & Browne, 2018; Ruefenacht, 2018). Closely related to service quality, Braun et al. (2016) includes the distribution channel (online vs. in person) in a CBC analysis about customer preferences for term life insurance. However, no experimental or survey-based research to date investigates the relative importance (RI) of a life insurer's service quality rating or the type of customer touchpoint (online vs. in person) compared to other life insurer attributes.

In this paper, we thus use CBC analyses to investigate customer preferences in the life insurance sector. In contrast to existing research, we do not focus on a single life insurance product or product attributes, but instead aim to answer the question: What are the most important *company* characteristics of life insurers for customers when purchasing annuities and term life insurances?

For both contract types, we conduct a separate CBC analysis, describing a realistic and contract-specific purchase situation at the beginning of the survey. Selection tasks represent purchase options from different providers, where the life insurers' attributes (financial strength, sustainability, and service quality) are transparently communicated as ratings along with the type of customer touchpoint (online and/or in person) and the product's price. We collect 543 (529) responses for the survey about term life insurances (annuities), while ensuring that the age of the German respondents matches the respective contract-specific purchase situations. We use hierarchical Bayes (HB) methods to estimate part-worth utilities and the marginal WTP (MWTP) for different levels of the life insurer's attributes based on multinomial logit models. Additionally, we compute the RI for the different attributes and statistically test for product-specific differences. This approach comes with limitations (e.g., missing incentive-compatibility)

¹In reality, customers will more likely access financial ratings of the insurer provided by financial advisors or aggregators rather than default probabilities, which we take into account in the present study.

and survey sampling bias) and, therefore, our findings should only be generalized with caution. However, we perform various robustness checks to assess the plausibility and coherence of our results.

In line with rational behavior, we find that part-worth utilities increase statistically significant for better ratings of the life insurer, supporting the plausibility of our results. Furthermore, the observed difference in utility between two consecutive ratings decreases for better ratings, that is, the increase in utility is concave. As a result, customers seem to be more focused on avoiding bad ratings. Since this observation also materializes in terms of economic consequences measured by the MWTP, our results suggest that life insurers should be more concerned with avoiding average or below-average ratings rather than competing for the best ratings in the market. The most relevant life insurer attribute for customers in our sample (measured by the RI) is financial strength, followed by service quality, sustainability, and type of customer touchpoint. This preference order for firm attributes is identical for annuities and term life insurances and is also consistent across different subgroups of respondents regardless of gender, age, education, and income.

In what follows, Section 2 presents the methodology and Section 3 the survey setup. Results, implications, and robustness checks are shown in Section 4, and Section 5 concludes.

2 | CBC ANALYSIS

In this section, the concept of CBC analyses is presented along with different metrics used to evaluate customer preferences.

2.1 | Overview and limitations

The CBC analysis is a research method originally developed in marketing to investigate the importance of specific product attributes and levels. Individuals are repeatedly faced with a set of alternative product profiles (differing in their combination of attribute levels) and asked to choose the most preferred alternative. This approach has multiple advantages over other methods (see DeSarbo et al., 1995): The setting represents more realistic purchase situations and allows to include a no-buy option. Selection tasks are easier and more intuitive for respondents than rating- or ranking-based questionnaires, and can be used to indirectly compute the customers' WTP for specific product attributes. This is particularly advantageous for life insurance products, as the complexity of products makes it difficult for respondents to directly state their WTP without reference values. For example, Miller et al. (2011) showed that CBC analyses perform better than direct approaches when products are more expensive and only rarely purchased. Finally, well-developed and advanced software is available to perform CBC analyses due to its large popularity in marketing, like Sawtooth Software (www. sawtoothsoftware.com) or Conjointly (www.conjointly.com).

Despite the advantages of CBC analyses, limitations exist. CBC analyses provide more accurate results within incentive-aligned settings, where the respondents' decisions have some real-world effect, for example, allowing to purchase the most preferred product profile after the survey (see Miller et al., 2011). The long contract terms and high premium volumes in life insurance, however, make it difficult to create an incentive-aligned mechanism in the present setting.² Therefore, our CBC analyses are not incentive-aligned, which causes two

potential challenges: Since survey participants do not have to actually pay the displayed price of their choices, the observed relevance of price could be underestimated in our survey. As a consequence, all WTP estimates must be interpreted with care and only assessed in relative and not absolute values.³ As a second problem, survey participants may be tempted to provide random answers in the survey, because their decisions have no real-world effects. To reduce this problem, we cooperate with a German service provider to recruit participants from a monitored survey panel to ensure high-quality responses. Furthermore, we use well-developed software, which is capable to identify respondents' fraudulent or random behavior, and also run several robustness checks to assess the plausibility and coherence of our results.

A specific problem related to life insurance products is that premiums are directly linked to, for example, the customers' age or the contract term. To address this issue, we only examine restrictive but realistic purchase situations with a given contract term and only allow survey participants whose age matches these given purchase situations. Additionally, we aimed to display more realistic prices in our survey by assigning the survey participants to different age groups with age-specific price levels retrieved from Germany's largest aggregator www.check24. de, similar to Braun et al. (2016). However, since accurate underwriting based solely on age categories is impossible, the observed relevance of price could still potentially be biased and should be assessed with care.

2.2 | The conjoint multinomial logit model

CBC analyses build on the theoretical foundations described in McFadden (1974), which are also discussed, for example, in Braun et al. (2016) or Gatzert and Hanika (2023). An individual *i* faces a subset of alternatives $A_i \subset A$ and has to make a discrete choice Y_i . Each alternative $a \in A$ yields an individual utility $U_{ia} = v_{ia} + \varepsilon_{ia}$ that is split into a deterministic part v_{ia} and some stochastic error term ε_{ia} . The stochastic error term ε_{ia} reflects the individual's utility of alternative *a*'s unobservable attributes along with some random noise. The deterministic part v_{ia} describes the individual's utility depending on *K* observable attributes, where each attribute *k* can take M_k levels. Thereby, a linear-additive utility function is assumed (see, Gatzert & Hanika, 2023), that is,

$$v_{ia} = \sum_{k=1}^{K} \sum_{m=1}^{M_k} \beta_{ikm} \cdot x_{akm},$$
 (1)

where

$$x_{akm} = \begin{cases} 1 \text{ if level } m \text{ is used for attribute } k \\ 0 \text{ else} \end{cases}$$

defines the design of alternative *a* and β_{ikm} describes the unknown (to be estimated) part-worth utilities of individual *i*.

²To investigate the role of life insurer attributes on customers' purchase behavior, we would need to cooperate with multiple life insurers to create an incentive-aligned mechanism.

³Note that this seems acceptable for the purpose of this study, which is not about "accurate pricing," but instead focuses on the RI and general patterns in customer preferences related to life insurer attributes.

Individuals are assumed to be utility maximizers, that is, choosing the alternative *y* with the highest utility $U_{iy} = \max\{U_{ia} : a \in A_i\}$. Under this assumption, different discrete choice models can be derived depending on the distribution of the error term ε_{ia} . The most widely used discrete choice model assumes Gumbel distributed error terms and is called multinomial logit model⁴ (see Train, 2009):

$$P(Y_{i} = y|A_{i}) = \frac{\exp(v_{iy})}{\sum_{a \in A_{i}} \exp(v_{ia})} = \frac{\exp\left(\sum_{k=1}^{K} \sum_{m=1}^{M_{k}} \beta_{ikm} \cdot x_{ykm}\right)}{\sum_{a \in A_{i}} \exp\left(\sum_{k=1}^{K} \sum_{m=1}^{M_{k}} \beta_{ikm} \cdot x_{akm}\right)}.$$
(2)

Given this model, the probability of choosing alternative y is equal to the ratio between the observable utility of alternative y and the sum of all observable utilities of the competing alternatives $a \in A_i$.

The unknown part-worth utilities β_{ikm} can be estimated with HB methods. These resampling methods assume that for all individuals i, the parameter vectors $\beta_i = (\beta_{ikm})_{k=1, \dots, K; m=1, \dots, M_k}$ are given as i.i.d. realizations of a multivariate normal distribution with some mean vector b and covariance matrix W. Given Equation (2) and this distributional assumption, a likelihood function can be derived that describes jointly the likelihood of observing the choice data from a survey depending on the parameter vectors β_i along with the likelihood of observing the parameter vectors β_i depending on the mean vector b and the covariance matrix W. The parameter vectors β_i , the mean vector b, and the covariance matrix W are then estimated by maximizing the likelihood function. The advantage of these methods is that for each individual *i*, separate part-worth utilities can be estimated to account for the variation between individuals' preferences, but the estimated mean vector b and the covariance matrix W also make use of similarities in the population's preferences to improve the estimation procedure. A detailed description of these methods (which are applied in the following analysis) can be found, for example, in Train (2009).

2.3 | Metrics for customer preferences

Estimated part-worth utilities directly provide information about an individual's utility of the specific attribute levels, that is, β_{ikm} describes the utility of individual *i*, if the alternative's attribute *k* equals level *m* (see Equation (1)). To increase the interpretability and to compare the part-worth utilities between different attributes or CBC analyses, we compute standardized values β_{km}^* for each attribute level (see Gatzert & Hanika, 2023). The average part-worth utilities $\bar{\beta}_{km} = 1/n \cdot \sum_{i=1}^{n} \beta_{ikm}$ are zero-centered by subtracting the average attribute utility $\bar{\beta}_k = 1/M_k \cdot \sum_{m=1}^{M_k} \bar{\beta}_{km}$ and normalized by division by the maximum utility gain, that is,

$$\beta_{km}^{*} = \frac{\bar{\beta}_{km} - \bar{\beta}_{k}}{\sum_{j=1}^{K} \left(\max_{l=1, \dots, M_{j}} \{ \bar{\beta}_{jl} \} - \min_{l=1, \dots, M_{k}} \{ \bar{\beta}_{jl} \} \right)}.$$
(3)

⁴Other examples include GEV models (generalized extreme value distributed error terms) and Probit models (normally distributed error terms). A mathematical derivation of these models is given, for example, in Train (2009).

Then, β_{km}^* can be interpreted as average normalized preference for level *m* of attribute *k*, where all values are between -1 and 1. The utility ranges of all attributes sum up to one, that is, $\sum_{k=1}^{K} \left(\max \left\{ \beta_{km}^* \right\} - \min \left\{ \beta_{km}^* \right\} \right) = 1$, and higher positive values indicate higher preferences for the specific attribute levels, while more negative values indicate stronger aversions.

To assess the RI of different attributes along with the economic consequences for changing attribute levels, we investigate two additional metrics (see Braun et al., 2016). The first metric is the individual RI

$$RI_{ik} = \frac{\max_{m=1, ..., M_k} \{\beta_{ikm}\} - \min_{m=1, ..., M_k} \{\beta_{ikm}\}}{\sum_{j=1}^{K} \left(\max_{m=1, ..., M_j} \{\beta_{ijm}\} - \min_{m=1, ..., M_j} \{\beta_{ijm}\}\right)},$$
(4)

which on a scale from zero to 100% measures how much the k-th attribute contributes to the product's overall utility for individual i.

The second metric is the MWTP, where $MWTP_{ik}(m_1, m_2)$ describes the potential in- or decrease of utility in monetary terms for individual *i* when attribute *k* is changed from level m_1 to level m_2 (see Braun et al., 2016). This metric requires that one attribute, for example, k = 1, is the product's price with numerical price levels $p_1, p_2, ..., p_{M_1}$. Then, the MWTP for any attribute $k \neq 1$ is defined by (see Braun et al., 2016)⁵

$$\text{MWTP}_{ik}(m_1, m_2) = \frac{\max_{m=1, \dots, M_1} \{p_m\} - \min_{m=1, \dots, M_1} \{p_m\}}{\max_{m=1, \dots, M_1} \{\beta_{i1m}\} - \min_{m=1, \dots, M_1} \{\beta_{i1m}\}} \cdot (\beta_{ikm_2} - \beta_{ikm_1}).$$
(5)

3 | SURVEY DESIGN

To investigate customers' purchase preferences for company characteristics of life insurers, we conduct two CBC analyses, one for annuities and one for term life insurances. In the following subsections, we describe the considered company characteristics of life insurers used as attributes in the CBC analyses and discuss the survey design as well as the sample selection.

3.1 | Attributes and levels

Many aspects can influence customers' purchase behavior for life insurance products, like product characteristics or the way the contract is concluded, but also the perception of the insurer itself. In this study, we focus on the latter and include the life insurer's financial

⁵Note that the definition of the MWTP in Equation (5) has some limitations as also pointed out by Braun et al. (2016): It relies on the assumption of no market competition and a linearly decreasing utility in price (see Orme, 2001). While it is possible to embed parameter constrains in the HB estimation procedure to ensure a monotonically decreasing utility in price for all individuals (as done in Braun et al. (2016)), we refrain from doing so to avoid overseeing any violation of scope sensitivity in our results. Instead, as a robustness check, we analyze the consistency of our results on a subsample restricted to those respondents, whose estimated utilities monotonically decreased in price.

strength, sustainability, and service quality (all specified by ratings) as attributes in our CBC analyses, which are commonly provided by online aggregators. For example, the ranking of annuity offers on Germany's largest aggregator www.check24.de is based on a tariff rating that is transparently displayed and also includes different ratings of the life insurer.⁶

With respect to financial strength, the US aggregators www.insure.com or www.quotacy. com provide A.M. Best credit ratings of life insurers as a decision support. Similarly, www. check24.de displays annuity offers along with insurers' financial strength ratings, which are computed based on several financial indicators, like net return or solvency ratio. In contrast to the credit ratings of A.M. Best, ranging from A++ to B+, www.check24.de uses the five easy-to-understand verbal ratings excellent, very good, good, average, and below average. Therefore, we follow www.check24.de and use these five verbal ratings for the life insurer's financial strength in our CBC analyses, in contrast to previous research which used classic credit ratings in CBC analyses (see Lee et al., 2019; Shu et al., 2016).

In addition to financial strength, www.check24.de provides sustainability ratings of insurers, which consider environmental, social, and governance criteria. Particularly in the European Union, this topic becomes more relevant, as new regulatory reporting requirements are introduced, especially in the financial industry sector (see, e.g., Gatzert et al., 2020). For example, the sustainability ratings displayed by www.check24.de also take into account public available information about the life insurers' investment decisions in accordance with the EU taxonomy for sustainable activities (see Regulation (EU) 2020/852) as well as the Sustainable Finance Disclosure Regulation (see Regulation (EU) 2019/2088). Therefore, we include an insurer's sustainability rating as a second attribute in our CBC analyses with the same five levels as for financial strength.

As a third attribute, we consider a life insurer's service quality rating, which is commonly provided by aggregators based on rankings or customer reviews. For example, www.insure.com provides J.D. Power's rating for customer satisfaction and the average number of customer complaints registered by the NAIC. Similarly, www.check24.de uses various factors like comprehensibility of contract information or processing time for applications to compute their own service quality rating for life insurers. Analogously to the insurer's financial strength and sustainability rating, we include the service quality rating with the same five levels in our CBC analyses.

Next to different ratings of a life insurer, we also consider the touchpoints between insurer and policyholder, where digital applications can increase customer satisfaction (see Eckert et al., 2022). One touchpoint is the insurer's sales channel, which was included by Braun et al. (2016) in their CBC analysis for term life insurance with the two levels "online" and "in person," but turned out to be the least relevant attribute. Further, they observed that more customers preferred the sales channel to be in person, indicating that in life insurance, where product complexity is higher, many customers may prefer personal advice. However, COVID-19 changed the digital life of society, pushing the digital transformation also in the insurance industry. Therefore, as a last attribute related to the insurer, we include the type of customer touchpoint. In contrast to Braun et al. (2016), we use the three levels "only online," "only in person," and "online or in person" to include insurers with multiple channels, and mention additional touchpoints with policyholders addressed in Eckert et al. (2022) apart from

⁶Note that for term life insurance, www.check24.de focuses more on product-related attributes and currently only provides service quality ratings of the life insurer.

the sales channel, that is, customer advice, contract conclusion, policy modification, or the event of damage.

The product's price is the final attribute in our CBC analyses. This results in more realistic purchase situations and allows transforming part-worth utilities into economic values given by the MWTP (see Equation (5)). For both contract types, we use the responses of an initially asked screening question to assign each survey participant to one of five age groups with specific price levels based on real quotes from www.check24.de (see also Braun et al. (2016) for a similar approach).⁷ We thereby split the lower half of the age-specific price ranges in five equally distanced prices and use these as attribute levels (see Table A1 in the Appendix).⁸

3.2 | Product-specific questionnaires

For both insurance products (annuity and term life insurance), we conducted a separate CBC analysis, keeping the general product complexity as low as possible by not considering embedded options or guarantees, as our focus is on firm attributes. Further, we restricted our survey to immediate annuities, which are sold against single up-front premiums. For term life insurances, we followed Braun et al. (2016) and considered monthly premiums, since <1% of all term life insurance contracts were sold against single premiums in Germany in 2021 (see www. gdv.de). The survey's general set-up builds on Gatzert and Hanika (2023). Each survey participant processed only one CBC analysis to avoid behavioral biases. The questionnaires started with the screening question about age to display more realistic, age-specific price levels (see Section 3.1). Afterward, an introductory text guided the participants into a product-specific purchase situation. For the immediate annuity, the introductory text built on Fuino et al. (2020), where we included some additional information about the general product characteristics⁹:

"Imagine you are about to retire and want to invest some part of your savings in an immediate annuity that provides an annuity payment of $500 \in$ every month from now on, as long as you are alive. For this product you have to pay a single up-front premium. The premium amount depends on the specific product, which is offered by insurers with different characteristics. In each of the following 12 scenarios, please select the product that you prefer most."

The purchase situation for the term life insurance was motivated by an empirical study of Swiss Re (2013), showing that most people owning life insurance are married, have children, and make more money than their partner. Conversely to the immediate lifelong annuity, we stated a fixed contract term of 20 years for the term life insurance. This represents the default

⁷Note that additional characteristics of survey participants (e.g., job or being a smoker) would be required for an accurate underwriting. Therefore, the observed relevance of price and the values of the MWTP could potentially be biased and should be interpreted with care.

⁸We use the lower half of the offered price range, as our survey does not embed additional options or guarantees, in contrast to the products offered on www.check24.de.

⁹The text for the term life insurance and original wordings in German are provided in the Appendix (see Tables A2 and A3).

value at Germany's largest aggregator www.check24.de, is the most common term according to a survey conducted by Milliman (2021), and ensured that the children mentioned in the initially described purchase situation reach full age before the contract maturity. The death benefit was set to 100,000€ as in Braun et al. (2016). As both purchase situations describe a specific stage of life (near retirement for annuity or young adult for term life insurance), the problem of respondents imagining themselves at a different age than their current one could arise. To reduce this problem, we restricted the age of survey participants to 25-44 (60-79) years for the questionnaire on term life insurances (immediate annuities).

After the introductory text, 12 selection tasks had to be completed (see Figure 1). Each selection task displayed three alternatives for the respective type of contract offered by a different life insurer. The participants were asked to select the most preferred alternative or choose the no-buy option. The alternatives were specified by the firm attributes explained in Section 3.1, and differed in their random composition of attribute levels. The composition followed a fractional factorial choice design to ensure balance and minimal overlap between the displayed attribute levels. To avoid effects resulting from the presented ranking, the vertical order of the firm attributes randomly differed between the respondents. At the bottom of the screen, we added short explanations for the attributes (see Tables A4 and A5 in the Appendix). After the 12 selection tasks, we included two additional questions, where the survey participants had to indicate on a scale of 1 to 7 how well they could put themselves in the introductory described purchase situation and how comprehensible the selection tasks were. The questionnaires concluded with socio-economic questions about the participants' gender, education, job, wage, and previous experience with life insurance products.

Which of the following 20-year term life insurance policies with a death benefit of 100,000€ would you choose?



3.3 | Survey implementation and sample

Both CBC analyses were created and conducted with the survey platform Conjointly, which provides specialized software tools for marketing research with a particular focus on conjoint analyses (see www.conjointly.com). To ensure high-quality responses, we cooperated with a German service provider to access an online survey panel with rigorous quality control (see https://www.consumerfieldwork.com/esomar28.htm).¹⁰ To ensure that the survey participants used a screen large enough to see all attributes and descriptions at the same time without having to scroll, and to further reduce the likelihood of possible distractions, respondents were only allowed to process the survey with desktop computers, laptops, or tablets.

In the survey about term life insurance (annuity) 715 (663) individuals participated. From these, 55 (27) were excluded due to an incomplete survey, 29 (12) due to poor quality,¹¹ and 30 (26) due to the same IP address or browser cookie as another participant, leading to 601 (598) respondents. Two multinomial logit models (see Equation (2)) were fitted with HB methods. Both models obtained a strong fit with a McFadden's pseudo R^2 of 68.5% (72.8%) for the survey on term life insurance (annuity). Finally, we only analyzed the results of those respondents who indicated with a score of at least four out of seven that they could put themselves in the introductory described purchase situation and understood the selection tasks. This resulted in another 58 (69) excluded participants for term life insurances (annuities). Therefore, the results in the following section are based on $n_s = 543$ responses for the survey on term life insurances (49.0% female, average age 36.1 years), and $n_R = 529$ responses for the survey on annuities (55.0% female, average age 66.4 years). In our survey about term life insurance, the youngest (oldest) participant was 25 (44) years old and most participants were employed (76.1%), selfemployed (6.4%), or students (5.3%). In the survey about annuities, the youngest (oldest) participant was 60 (79) years old and most participants were retired (59.9%), employed (26.7%), or self-employed (7.0%). The distribution of participants' monthly net income and highest educational degree covers a wide range and is given in Table A6 in the Appendix.

As this group of survey participants may differ (e.g., in sociodemographic characteristics) from real-world purchasers of life insurance products, potential sampling bias could be present. Review articles demonstrate that sociodemographic characteristics such as age, gender, income, and education can significantly influence life insurance purchase decisions (see Alexandrova & Gatzert, 2019; Zietz, 2003). Most of the reviewed articles find a positive impact of higher income and education level on the demand of life insurance products. The impact of other factors appears to be less clear. For example, gender can have a complex and sometimes ambiguous effect on annuitization decisions (see Alexandrova & Gatzert, 2019).

A large-scale survey involving 8510 individuals across the EU found that men aged 50–59 years from the upper middle class with annual income exceeding 80,000 Euro are most likely to own life insurance (see Swiss Re, 2013). However, differences exist between purchasers of term life insurance and immediate annuities. An annuity buyer study conducted in the

¹⁰The panel comprises voluntary members whose identities are verified through their bank account information; they receive approximately 1–2 email invitations for surveys per month, which include information about the estimated survey length and their exact remuneration in Euro for successfully finishing the survey, but no information about the topic of the survey. Inactive members and members having a bad data history get automatically removed from the panel.

¹¹Conjointly automatically marks responses as poor quality, if the survey or conjoint tasks are completed too quickly, duplicate responses are provided, or too little scrolling and mouse movement are detected.

United States by LIMRA (2016) revealed that single premium immediate annuities are more frequently bought by females (54%) compared to males (46%), at an average age of 72 years. Conversely, a US survey study about term life insurance sales conducted by Milliman (2021) found that the average issuer age (weighted by face value) for term life insurance is 40 years, with males comprising 64% of sales.

While our survey sample accounts for age differences between the two product types, it does not capture other socio-demographic characteristics. As a result, our findings may be distorted and should be generalized with caution. To address this issue and further investigate the impact of socio-demographic characteristics on customer preferences, we conduct several robustness tests for specific subgroups of participants in Section 4.4.

4 | EMPIRICAL RESULTS

In this section, we present the results of our CBC analyses. We investigate customers' preferences for company characteristics of life insurers given by normalized level preferences, the RI of attributes, and the MWTP (see Section 2.3). Finally, we perform various robustness checks, to assess the plausibility and coherence of our results.

4.1 | Preferences for attribute levels

As a first result, Figure 2 shows the average normalized part-worth utilities β_{km}^* (see Equation (3)) for the different firm attribute levels used in both CBC analyses. Higher positive values indicate stronger average preferences for the respective attribute levels, while more negative values indicate stronger average dislikes. For the life insurer's financial strength, sustainability, and service quality, it can be seen that better ratings result in higher average preference levels. The largest difference between two consecutive ratings is at the lower end of the rating levels (below average vs. average) and then decreases continuously for successively better ratings. This pattern is consistent for all three ratings and for both contract types, and it is particularly pronounced for the attribute financial strength. It indicates that it is more important for an average customer that the life insurer is not ranked at the bottom of a rating than that the life insurer is placed at the top of a rating.

Consistent with economic expectations, average preferences decrease for higher premium levels. Compared to the ratings, this decrease is more linear. The difference between the lowest and highest premium level is 24.7% points in case of term life insurance, but only 21.1% points in case of the annuity, indicating that the insurance premium plays a more important role when purchasing term life insurance in our CBC setting.

While the results shown in Figure 2 are very similar for both contract types, differences exist regarding the type of customer touchpoint. For term life insurance, the lowest preference can be seen when the interaction with the life insurer is only possible in person, but for annuities when it is only possible online. In both cases, the most preferred attribute level is the multichannel "online and in person." Compared to the other attributes, the range of the average preferences for the type of customer touchpoint is relatively small, that is, from -3.0% to 3.2% (-4.4% to 3.9%) in case of the term life insurance (annuity). This suggests that the type of customer touchpoint is more relevant when purchasing an annuity than when purchasing term

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FIGURE 2 Average normalized preferences for the different attribute levels β_{km}^* (see Equation (3)) with 95% confidence intervals for term life insurance and annuity. The black whiskers represent 95% confidence intervals for the average normalized part-worth utilities β_{km}^* , estimated by bootstrapping under the empirical distribution function of β_{ikm} (i.e., the estimated values of β_{ikm} are treated as data) with 2500 replicates. They define the range in which β_{km}^* is expected to lie with 95% probability, given the empirical distribution function of β_{ikm} .

life insurance in our CBC setting, but is generally less relevant compared to the other attributes under consideration.

To test whether the increase in utility for better ratings of the life insurer is statistically significant, we performed various paired *t* tests. In contrast to the average normalized partworth utilities β_{km}^* shown in Figure 2, we focused on the by model assumption normally distributed part-worth utilities β_{ikm} for testing. Table 1 shows the difference in the means of the part-worth utilities $\bar{\beta}_{km} = 1/n \cdot \sum_{i=1}^{n} \beta_{ikm}$ for two consecutive ratings of the life insurer's financial strength, sustainability, or service quality along with the *t* statistics and *p* values. Similar to Figure 2, mean differences between the part-worth utilities for two consecutive

TABLE 1 Results of one-tailed paired t-tests for the difference between mean part-worth utilities of different levels $\bar{\beta}_{km} = 1/n \cdot \sum_{i=1}^{n} \beta_{ikm}$ regarding financial strength, sustainability, and service quality for term life insurance and annuity.

	Term li	fe insurance	e	Annuit	y	
Alternative hypothesis	Diff.	t	p Value	Diff.	t	p Value
Financial strength						
$ar{eta}_{ ext{excellent}} > ar{eta}_{ ext{very good}}$	0.177	10.511	<0.0001***	0.109	4.694	< 0.0001***
$ar{eta}_{ m very\ good} > ar{eta}_{ m good}$	0.678	22.701	< 0.0001***	0.825	27.800	< 0.0001***
$ar{eta}_{ ext{good}} > ar{eta}_{ ext{average}}$	1.603	36.001	< 0.0001***	1.755	39.930	<0.0001***
$ar{eta}_{ m average} > ar{eta}_{ m below\ average}$	3.972	41.054	<0.0001***	3.206	46.473	<0.0001***
Sustainability						
$ar{eta}_{ ext{excellent}} > ar{eta}_{ ext{very good}}$	0.003	0.125	0.4503	0.232	12.237	< 0.0001***
$ar{eta}_{ m very\ good} > ar{eta}_{ m good}$	0.432	15.403	< 0.0001***	0.190	7.716	<0.0001***
$ar{eta}_{ m good} > ar{eta}_{ m average}$	0.269	11.166	< 0.0001***	0.633	20.713	<0.0001***
$ar{eta}_{ ext{average}} > ar{eta}_{ ext{below average}}$	1.492	28.234	<0.0001***	1.132	30.607	<0.0001***
Service quality						
$ar{eta}_{ ext{excellent}} > ar{eta}_{ ext{very good}}$	0.201	11.309	< 0.0001***	0.008	0.443	0.3288
$ar{eta}_{ m very\ good} > ar{eta}_{ m good}$	0.364	13.935	< 0.0001***	0.443	15.690	< 0.0001***
$ar{eta}_{ ext{good}} > ar{eta}_{ ext{average}}$	0.815	24.298	< 0.0001***	0.810	20.934	< 0.0001***
$ar{eta}_{ m average} > ar{eta}_{ m below\ average}$	2.364	39.913	< 0.0001***	2.203	39.860	< 0.0001***

Note: Test results are calculated based on the empirical distribution function of β_{ikm} (i.e., the estimated values of β_{ikm} are treated as data).

***indicates significance at the 1% level.

ratings increase for increasingly worse ratings, which also applies for the corresponding t statistics. All differences are statistically significant (p-value < 0.0001) with two exceptions. For the term life insurance, the difference between the life insurer's sustainability ratings "excellent" and "very good" is only 0.003 (p-value = 0.4503). Similarly, for the annuity, the difference between the life insurer's service quality ratings "excellent" and "very good" is 0.008 (p-value = 0.3288). Therefore, in both cases, the hypothesis that the mean of the part-worth utilities is larger for the rating "excellent" than for the rating "very good" is not supported. Since the sum of all p values of the univariate tests serves as an upper bound for the p value of jointly testing the pairwise differences, we find support that the average part-worth utilities increase with better ratings of the life insurer except for the cases where the univariate tests fail, that is, the sustainability rating (term life insurance) and the service quality rating (annuity).

Additionally, we conducted paired *t* tests to separately investigate the mean differences between the part-worth utilities for two consecutive premium levels and between the single and multichannel customer touchpoint. Here, all differences were statistically significant (p-value < 0.0001), supporting the hypotheses of a strictly decreasing utility for higher

premium levels and a higher utility when the customer touchpoint is possible online and in person (see Tables A7 and A8 in the Appendix).

4.2 | Average and individual RI

To assess the relevance of the different company characteristics of a life insurer, Figure 3 shows the average RI (see Equation (4)), explaining how relevant a specific attribute is for an average customer when purchasing term life insurances or annuities, respectively. Since the RI of the premium could potentially be underestimated as the CBC analyses are not incentivecompatible and should be interpreted with care (see Section 2.1), we focus on the preference order for the life insurer attributes: It can be seen that the financial strength is the most important life insurer attribute for both contract types. This mostly results from the very strong dislike to a life insurer's financial strength rating of "below average" (see Figure 2). The second most relative important life insurer attribute for an average customer is the service quality, followed by sustainability. The least relative important attribute is the type of customer touchpoint.

While the order of the average RI of the five attributes is equal for both contract types, the figures still differ.¹² The largest difference exists for the type of customer touchpoint. For term life insurance, the average RI is 8.09%, which is clearly below the other attributes. For the annuity, it is 12.67% and, therefore, almost as relevant as the life insurer's sustainability rating (average RI of 12.91%). The second largest difference between the two contract types is the average RI of the premium, which is approximately 3% points higher for the term life insurance than the annuity.

To investigate whether these product-related differences in the average RI of attributes are statistically significant, we run five separate tests. Since the number of participants and therefore the sample size differs between the two contract types, we conduct two-sided Welch *t* tests (see Table 2). As already seen in Figure 3, the largest differences in the average RI exist for the type of customer touchpoint and the premium. Both differences are statistically significant (p-value < 0.01), suggesting that the average RI of the type of customer touchpoint and the premium strictly differ in our CBC setting, when purchasing an annuity or when purchasing a term life insurance. Regarding the premium as well as the life insurer's financial strength and sustainability, the differences in the average RI are not statistically significant, suggesting that the RI for these attributes are about equal for customers in our CBC analyses when purchasing a term life insurance or when purchasing an annuity.

To assess the extent of heterogeneity in customers' preferences in the context of a purely exploratory analysis, Figure 4 shows the distribution of the individual RI RI_{ik} for the five different attributes for term life insurance and annuity. The largest heterogeneity is observable for the premium, which is more pronounced for term life insurance (coefficient of variation: 0.593) than annuity (coefficient of variation: 0.565). As both distributions are right-skewed, this explains the higher RI of the premium for term life insurance in Figure 3. Furthermore, the right skewness indicates that for some customers, the premium is considerably more important

¹²Note that the comparisons between both product types might not hold with the same generality in a different purchase setting, as product-specific preferences for attributes not included in our CBC analyses could influence the results.



FIGURE 3 Average relative importance (RI) (see Equation (4)) of the life insurer attributes with 95% confidence intervals for term life insurance and annuity. The black whiskers represent 95% confidence intervals for the average RI estimated by bootstrapping under the empirical distribution function of β_{ikm} (i.e., the estimated values of β_{ikm} are treated as data) with 2500 replicates. They define the range in which the average RI is expected to lie with 95% probability, given the empirical distribution function of β_{ikm} .

Alternative hypothesis	Difference	t	p Value
Financial strength			
$\bar{RI}_{term \ life} eq \bar{RI}_{annuity}$	0.009542	1.490071	0.136502
Sustainability			
$ar{RI}_{ m term\ life} eqar{RI}_{ m annuity}$	0.005707	1.475442	0.140389
Service quality			
$\bar{RI}_{term \ life} eq \bar{RI}_{annuity}$	0.002688	0.673671	0.500672
Type of touchpoints			
$ar{RI}_{ m term\ life} eqar{RI}_{ m annuity}$	-0.045831	-9.359220	< 0.00001***
Premium			
$ar{RI}_{ m term\ life} eq ar{RI}_{ m annuity}$	0.027894	3.113671	0.001898***

TABLE 2 Results of two-sided Welch *t* tests for differences between the average RI of attributes $\overline{RI}_k = \sum_{i=1}^n R_{ik}$ (see Equation (4)) for term life insurance and annuity.

Note: Test results are calculated based on the empirical distribution function of β_{ikm} (i.e., the estimated values of β_{ikm} are treated as data).

Abbreviation: RI, relative importance.

***indicates significance at the 1% level.

than for the average customer. Similar results can be seen for the type of customer touchpoint, but to a lower extent and reversed with respect to the contract type. Here, the coefficient of variation is 0.081 for the term life insurance and 0.127 for the annuity.

Regarding the service quality, the distributions of both contracts are approximately symmetric with similar means (see also Figure 3). However, the distribution for term life insurance Risk Management and Insurance Review $-\mathbf{W}$



FIGURE 4 Kernel density plots for the individual relative importance (RI) (see Equation (4)) of the different life insurer attributes for term life insurance and annuity.

is broader (coefficient of variation: 0.196), while the distribution for the annuity is more peaked (coefficient of variation: 0.193). This suggests that customer preferences regarding the life insurer's service quality are more inhomogeneous in case of the term life insurance compared to the annuity in our CBC setting. The distributions of sustainability are right-skewed and similar for both contract types. The distribution for term life insurance is broader (coefficient of variation: 0.135) with a more pronounced right tail compared to the annuity (coefficient of variation: 0.129), explaining the slightly higher average RI seen in Figure 3. Regarding financial strength, a broader distribution can be seen for the term life insurance (coefficient of variation: 0.323) than for the annuity (coefficient of variation: 0.313). Furthermore, these are the only left-skewed distributions, indicating that for both contracts a considerable segment of customers values the life insurer's financial strength less than the average customer.

To exploratively investigate this specific segment of customers, Figure 5 shows the distributions of the individual RI of the life insurer's financial strength for specific subgroups, determined by the respondents' gender, education, and monthly net income.¹³ For term life insurance, the left part of Figure 5 illustrates that the customer segment with the lower RI of financial strength is more pronounced for males, nonacademics and individuals with a lower net income. While males are often assumed to be less risk-averse, this also suggests that individuals with higher education are less likely to ignore the life insurer's financial strength in their decision-making. Similar effects (but to a lesser extent) can be seen for the annuity.

4.3 | MWTP

In this section, we investigate the economic consequences for a life insurer in terms of the MWTP if ratings for a specific attribute or the type of customer touchpoint are changed. Given

¹³Section 4.4 provides statistical evidence of potential differences in the RI between these customer subgroups for all attributes.



FIGURE 5 Kernel density plots of the individual relative importance (RI) (see Equation (4)) of the life insurer's financial strength for term life insurance and annuity for different subgroups.

Equation (5), a specific attribute level (a reference point) must be defined for each attribute, which serves as the benchmark based on which individuals evaluate the other levels. The MWTP then explains how much more or less customers are willing to pay if the given attribute is changed from this reference point to another level. As reference points, we use the attribute level "good" for the ratings of the life insurer and "only in person" for the type of customer touchpoint, representing an expected status quo. The customers' median MWTP is shown in Figure 6 for the age groups 35–39 years (term life insurance) and 65–69 years (annuity).¹⁴ Improving the life insurer's rating results in a successively higher median MWTP, while a decrease results in a successively lower MWTP. This holds true for both contract types and for all three ratings (financial strength, sustainability, service quality). If the type of customer touchpoint is changed from "only in person" to "online and in person," the median customer is willing to accept a higher premium for term life insurance and the immediate annuity.

¹⁴Since we state age-specific premiums in our surveys (see Section 3.1), we also compute the MWTP separately for each age group to improve the interpretability of the results. The results for the other age groups are provided in the Appendix (see Figures A1–A3). See Table A1 in the Appendix for the corresponding range of price levels.



FIGURE 6 Median marginal willingness to pay (MWTP) (see Equation (5)) in \in for different firm attribute levels with 95% confidence intervals for term life insurance and annuity. The figure shows the median MWTP for the specific age groups of 35–39 years (term life insurance) and 65–69 years (annuity) for specific reference points (labeled on the y-axis) describing how much more or less the median customer is willing to pay if an attribute is changed from the given reference point to the other levels. The black whiskers represent 95% confidence intervals for the median MWTP estimated by bootstrapping under the empirical distribution function of β_{ikm} (i.e., the estimated values of β_{ikm} are treated as data) with 2500 replicates. They define the range in which the median MWTP is expected to lie with 95% probability, given the empirical distribution function of β_{ikm} .

Switching the type of customer touchpoint to "only online" results in a positive MWTP for the term life insurance, but in a negative MWTP for the annuity due to customers' reversed preferences of this attribute level (see Section 4.1).

Regarding the extent of economic consequences, the values of the MWTP reveal that the potential amount of premium in- or decrease is highest for the life insurer's financial strength, followed by service quality, sustainability, and type of customer touchpoint, analogously to the RI of the attributes (see also Figure 3). Moving the ratings from the reference value "good" down to "average" ("below-average") has a clearly more pronounced negative economic impact than the positive economic impact of moving the ratings from "good" up to "very good" ("excellent") would be. This observation is consistent among all three ratings and both contract types, and is particularly more pronounced for the life insurer's financial strength. These results

indicate that life insurers should be more concerned with getting downgraded to a particularly bad rating than trying to obtain a particularly good rating. This seems to be even more relevant against the empirical observations of, for example, Eling and Schmit (2012), showing that a downgrade of an insurer's financial rating results in an observable decrease in premium growth in subsequent years, while a rating upgrade leads to less clear reactions in premium growth.

4.4 | Robustness checks

While the increasing average part-worth utilities for better ratings of the life insurer, the decreasing average part-worth utilities for higher prices, and the highest average part-worth utility for the multichannel online and in person (see Section 4.1) already demonstrate the plausibility of our fitted choice models, we conducted several additional robustness checks.

Since we did not include any parameter constraints in our choice models to avoid concealing any violation of scope sensitivity in the results, the estimated part-worth utilities were not strictly decreasing in price for all survey participants. Therefore, we analyzed our results additionally only for those survey participants with strictly decreasing part-worth utilities in price. For the standardized level preferences and the MWTP, we observed similar results. Only the values for the financial strength rating "excellent" became slightly smaller than for the rating "very good" in the case of the annuity. Regarding the RI, we observed a higher relevance of the premium for both contract types (annuity and term life insurance) in this subsample. While for the annuity the previously observed preference order remained the same, for term life insurance the premium become relative more important than the insurer's financial strength. Furthermore, we observed a statistically significant difference in the average RI for the life insurer's service quality (p-value = 0.076), with a higher RI of 18.43% for the annuity compared to a RI of 17.60% for the term life insurance. As additional robustness checks, we analyzed our results for (1) all survey participants regardless of their self-assessment related to the perception of the purchase setting and the selection tasks, and (2) only those survey participants who stated that they either own or plan to purchase term life insurance or annuity insurance. In both cases, we observed no relevant impact on the results.

To assess the robustness of the identified preference order for the analyzed attributes, we calculated and compared the RI between different subsamples given by the participants' gender, age, education, and income. Tables 3 and 4 show the average RI for these subsamples along with the p values of Kruskal–Wallis tests for testing whether the medians of the RI are equal for the respective subgroups.¹⁵ As a first result, it can be seen that the preference order is very consistent among all subsamples, that is, the insurer's financial strength is the relative most important attribute, followed by the premium, the service quality, sustainability, and the type of customer touchpoint. The only exception is that the type of customer touchpoint is more important than the insurer's sustainability in case of older or high educated annuity purchasers.

For both contract types, the premium is relatively more important for males, while the insurer's service quality, sustainability, and type of customer touchpoint are relatively more important for females. In case of the annuity, the RI of the premium is higher for respondents with a high or low income compared to the respondents with a medium income, which is

¹⁵Note that we had to exclude 48 (52) additional respondents in this analysis, who decided to not answer at least one demographic question from the survey about term life insurance (annuities).

				Service							
Attribute level	Num	Financial strength (fs)	Premium (pr)	quality (sq)	Sustainability (su)	Touchpoint (tp)	<i>p</i> Value (fs)	<i>p</i> Value (pr)	<i>p</i> Value (sq)	<i>p</i> Value (su)	<i>p</i> Value (tp)
Overall	495	0.321	0.269	0.194	0.135	0.081					
Gender											
Female	239	0.322	0.253	0.199	0.140	0.086	0.874	0.011^{**}	0.053*	0.012^{**}	0.033**
Male	256	0.320	0.284	0.188	0.130	0.077					
Age											
25-34	179	0.314	0.253	0.206	0.144	0.083	0.364	0.082^{*}	0.004^{***}	0.075*	0.839
35-44	316	0.326	0.278	0.187	0.130	0.080					
Education											
Low	23	0.306	0.259	0.194	0.152	0.089	0.467	0.352	0.514	0.155	0.378
Medium	244	0.325	0.262	0.198	0.136	0.079					
High	228	0.319	0.277	0.188	0.132	0.083					
Income											
Low	45	0.331	0.249	0.202	0.141	0.077	0.114	0.194	0.750	0.734	0.398
Medium	313	0.326	0.266	0.195	0.134	0.080					
High	137	0.308	0.283	0.189	0.135	0.085					
<i>Note:</i> Survey pidiploma, and to more a high invresectively. Te	articipants o "high edu come. The st results	are assigned to "low acation" if they hold <i>p</i> values indicate th are calculated based	v education" if th an academic deg e results of Krush on the empirical	ey hold a lower ree. A monthly r cal-Wallis tests f distribution fur	secondary school diplo net income of below 150 or differences in the m nction of $\beta_{i,m}$ (i.e., the e	ma, to "medium edu 00€ represents a low i edian between the gr estimated values of β	ication" if the ncome, of 15(oups, where ²	y hold a higl 0€ to below *, **, *** indi I as data).	ıer secondary 3000€ a medi cate significa	y school or h ium income, nce at 10%, '	igh school and 3000€ or %, 1% levels,
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Abbreviation: RI, relative importance.

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Attribute level	Num	Financial strength (fs)	Premium (pr)	Service quality (sq)	Sustainability (su)	Touchpoint (tp)	<i>p</i> Value (fs)	<i>p</i> Value (pr)	<i>p</i> Value (sq)	<i>p</i> Value (su)	<i>p</i> Value (tp)
Overall	477	0.335	0.241	0.193	0.128	0.125					
Gender											
Female	260	0.336	0.224	0.202	0.130	0.133	0.657	0.015**	0.000***	0.476	0.084^{*}
Male	217	0.337	0.262	0.182	0.127	0.116					
Age											
69-09	355	0.338	0.247	0.194	0.128	0.120	0.854	0.263	0.353	0.991	0.034^{**}
70-79	122	0.339	0.226	0.189	0.128	0.140					
Education											
Low	87	0.302	0.236	0.203	0.140	0.119	0.335	0.193	0.091^{*}	0.002^{***}	0.663
Medium	269	0.315	0.236	0.193	0.131	0.125					
High	121	0.314	0.256	0.186	0.115	0.129					
Income											
Low	73	0.317	0.258	0.187	0.122	0.116	0.768	0.024^{**}	0.031^{**}	0.324	0.221
Medium	313	0.310	0.230	0.197	0.131	0.131					
High	61	0.318	0.265	0.181	0.123	0.113					
<i>Note</i> : Survey pi diploma, and to more a high ino	articipants , "high edu come. The	are assigned to "low ication" if they hold <i>p</i> values indicate the	education" if th an academic deg results of Krus	hey hold a lower gree. A monthly kal-Wallis tests	r secondary school diplent net income of below 15 for differences in the m	oma, to "medium edu 00€ represents a low j aedian between the gr	acation" if th income, of 15 roups, where	ey hold a hi 00€ to belov *, **, *** inc	gher seconda v 3000€ a mec licate signific	ry school or h lium income, ance at 10%, <u>5</u>	igh school and 3000€ or %, 1% levels,

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respectively. Test results are calculated based on the empirical distribution function of β_{lom} (i.e., the estimated values of β_{lom} are treated as data).

Abbreviation: RI, relative importance.

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reversed for the RI of an insurer's service quality. Furthermore, the respondents' education statistically significantly influences the RI of an insurer's sustainability (p-value = 0.002), whereby the median RI decreases for a higher education. Finally, the median RI of the insurer's sustainability is statistically significantly higher (p-value = 0.004) for younger individuals than older individuals in case of the term life insurance, which could be explained by younger individuals being more concerned and sensitized toward the topic of sustainability.

5 | SUMMARY

In this paper, we examine customer preferences when purchasing life insurance products. In contrast to previous research, we focus on firm characteristics of life insurers (namely financial strength, sustainability, service quality, and type of customer touchpoint) rather than product attributes. Furthermore, we study product-specific differences in customer preferences for these firm attributes by comparing the purchase situation of term life insurances with immediate lifelong annuities. For both contract types, we run a separate CBC analysis with German respondents. We estimate the participants' part-worth utilities for the different attribute levels and study three different metrics: the average normalized preferences for attribute levels, the RI of attributes, and the MWTP. The results are analyzed and statistically tested for specific preferences in attribute levels as well as product-specific differences. We acknowledge that this approach has limitations: A missing incentive-compatibility and potential survey sample bias could lead to distorted results. Consequently, our findings should be generalized with caution. Nevertheless, given the complexity of designing an incentive-compatible experiment in life insurance which accounts for life insurer characteristics, we believe our approach is appropriate to gain insight on this topic. Additionally, while sample bias is an inherent challenge, we conducted several robustness checks which suggest the plausibility and coherence of our results.

Consistent with economic and behavioral expectations, we find that customers' average part-worth utilities increase for better ratings of the life insurer, independent of the attribute or contract type. Thereby, differences in part-worth utilities are more pronounced between two lower consecutive ratings than between two higher consecutive ratings, indicating that insurers should place more emphasis on avoiding bad ratings. These observations also materialize in economic values, where the analysis of the MWTP shows that a change in a life insurer's attribute level can result in considerable economic consequences, which is particularly pronounced for the life insurer's financial strength. However, accounting for customers' asymmetric preferences, it seems to be more important for life insurers to avoid average or belowaverage ratings rather than to compete for the best ratings in the market.

The average normalized preferences for attribute levels are similar for both contract types. Only a pure "online" contact between insurer and policyholder is preferred over a pure "in person" contact for term life insurance, which is reversed for the annuity. Our results further show that the relative most important life insurer attribute is financial strength followed by service quality, sustainability, and type of customer touchpoint. This preference order is the same for both contract types and robust among different subsamples given by the participants' gender, age, education, and income. The extent of the average RI of some attributes differs statistically significant between term life insurance and annuity, whereby especially the type of customer touchpoint (online vs. in person) seems to be more important when purchasing an annuity in our CBC setting. In summary, our empirical results suggest that customers take life insurer firm attributes into account when making their purchase decision, but the relevance of different attributes varies. Most customer preferences are similar for the two investigated types of contracts, but differ in specific aspects. One major finding is that it is more important for a life insurer to avoid being at the lower end of a ranking, and that especially the life insurer's financial strength is a very important firm attribute for customers, also as compared to other firm attributes.

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APPENDIX A

Price levels for an	nuities in € (single	premium)					
Age group	Very low	Low	Medium	High	Very high		
60–64	120,000	126,000	132,000	138,000	144,000		
65–69	110,000	115,000	120,000	125,000	130,000		
70–74	90,000	94,500	99,000	103,500	108,000		
75–79	85,000	87,500	90,000	92,500	95,000		
Price levels for term life insurances in € (monthly premiums)							
Age group	Very low	Low	Medium	High	Very high		
25–29	3.00	4.50	6.00	7.50	9.00		
30-34	4.00	6.00	8.00	10.00	12.00		
35-39	5.00	7.50	10.00	12.50	15.00		
40-44	8.00	12.00	16.00	20.00	24.00		

TABLE A1 Price levels used in the CBC analyses.

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Abbreviation: CBC, choice-based conjoint.

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Original wording in German	English translation
Stellen Sie sich vor, Sie stehen kurz vor dem Ruhestand	Imagine you are about to retire and want to
und wollen einen Teil Ihres angesparten Vermögens in	invest some part of your savings in an
eine Sofortrente investieren, bei der Sie ab sofort jeden	immediate annuity that provides an annuity
Monat eine Rentenzahlung in Höhe von 500€ erhalten,	payment of 500€ every month from now on,
solange Sie am Leben sind. Hierfür müssen Sie eine	as long as you are alive. For this product you
einmalige Prämie zahlen. Die Höhe der Prämie hängt vom	have to pay a single up-front premium. The
konkreten Produkt ab, und wird von	premium amount depends on the specific
Versicherungsunternehmen mit unterschiedlichen	product, which is offered by insurers with
Merkmalen angeboten. Wählen Sie bitte in den folgenden	different characteristics. In each of the
12 Szenarien jeweils dasjenige Produkt aus, das Ihnen am	following 12 scenarios, please select the
ehesten zusagen würde.	product that you prefer most.

TABLE A3 Described purchase situations in the term life insurance survey.

Original wording in German	English translation
Stellen Sie sich vor, Sie sind die hauptverdienende Person in einer festen Partnerschaft mit Kindern. Um Ihre Familie finanziell abzusichern, möchten Sie eine Risikolebensversicherung mit einer Versicherungsleistung von 100.000€ abschließen. Diese wird Ihren Hinterbliebenen ausgezahlt, wenn Sie innerhalb des vertraglich festgelegten Zeitraums von 20 Jahren versterben. Hierfür müssen Sie eine monatliche Prämie zahlen. Die Höhe der Prämie hängt vom konkreten Produkt ab, und wird von Versicherungsunternehmen mit unterschiedlichen Merkmalen angeboten. Wählen Sie bitte in den folgenden 12 Szenarien jeweils dasjenige Produkt aus, das Ihnen am ehesten zusagen würde.	Imagine you live in a stable partnership with children and you have a higher income than your partner. To financially protect your family, you would like to purchase a term life insurance contract with a death benefit of 100,000€. The death benefit will be paid to your surviving relatives if you die within the contractually defined period of 20 years. For this product you have to pay a monthly premium. The premium amount depends on the specific product, which is offered by insurers with different characteristics. In each of the following 12 scenarios, please select the
	product that you prefer most.

Premium type	Original wording in German	English translation
Monthly premium	Die monatliche Prämie gibt den Betrag an, den Sie jeden Monat über den vertraglich festgelegten Zeitraum von 20 Jahren bzw. bis zum Versicherungsfall an den Versicherer zahlen müssen.	The monthly premium indicates how much you have to pay every month to the insurer over the contractually defined contract term of 20 years or until the insured event occurs.
Single premium	Die einmalige Prämie gibt den Betrag an, den Sie zu Beginn einmalig an den Versicherer zahlen müssen.	The single premium indicates how much you have to pay to the insurer at the beginning of the contract.

TABLE A4 Description of the price attributes used in the CBC analyses.

Abbreviation: CBC, choice-based conjoint.

Attribute	Original wording in German	English translation
Financial strength	Die Bewertung der Finanzstabilität gibt an, wie hoch die Reserven und die Ertragsstärke des Versicherers sind. Sie erklärt deshalb, wie sicher Sie sich sein können, dass Ihre Versicherungsansprüche gezahlt werden können oder nicht.	The financial strength rating provides information about the insurer's reserves and profitability. It, therefore, explains how likely it is that your insurance claims can be paid by the insurer or not.
Sustainability	Die Bewertung der Nachhaltigkeit des Versicherers gibt an, wie groß der unternehmerische Beitrag des Versicherers in den Bereichen Umwelt, Soziales und Unternehmensführung ist.	The sustainability rating of the insurer indicates the amount of the insurer's corporate contribution in the environmental, social, and governance areas.
Service quality	Die Bewertung der Servicequalität des Versicherers gibt an, wie gut dessen Serviceleistungen in Bezug auf Verlässlichkeit, Geschwindigkeit, Einfühlvermögen, Kompetenz und Erscheinungsbild sind.	The service quality rating of the insurer indicates how satisfactory its services are in regard to reliability, responsiveness, empathy, competence, and appearance.
Type of customer touchpoint	Die Form des Kundenkontakts gibt an, wie Kundenberatung, Vertragsabschluss, Anpassungen des Vertrages sowie Schadenabwicklung durchgeführt werden können.	The type of customer touchpoint indicates how customer advice, contract conclusion, contract modifications, and claims processing can be carried out.

FABLE A5	Description of the life	e insurer attributes	used in the	CBC analyses.
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Abbreviation: CBC, choice-based conjoint.

TABLE A6	Number of	respondents	depending or	n monthly net	income and	educational	degree.
		1	1 0	<i>,</i>			0

Income	Annuity	Term life insurance
Below 1000€	73 (13.8%)	45 (8.3%)
1000€ up to below 3000€	315 (59.5%)	314 (57.8%)
3000€ or more	91 (17.2%)	139 (25.6%)
Chosen not to answer	50 (9.5%)	45 (8.3%)
Education		
Lower secondary school	95 (18.0%)	27 (5.0%)
Medium or higher secondary school	293 (55.4%)	258 (47.5%)
Academic degree	136 (25.7%)	255 (47.0%)
Chosen not to answer	5 (0.9%)	3 (0.5%)

 $\bar{\beta}_{\text{high}} > \bar{\beta}_{\text{very high}}$

1.174

20.049

p_{km}	$P_{km} = P_{km}$ for term ine instrained and animally.									
	Term li	Term life insurance			Annuity					
Alternative hypothesis	Diff.	t	p Value	Diff.	t	p Value				
$\bar{\beta}_{ m verylow} > \bar{\beta}_{ m low}$	0.459	9.519	<0.0001***	0.489	9.677	< 0.0001***				
$ar{eta}_{ m low} > ar{eta}_{ m average}$	0.977	20.319	<0.0001***	0.719	12.596	<0.0001***				
$\bar{\beta}_{\rm average} > \bar{\beta}_{\rm high}$	1.475	29.914	< 0.0001***	1.046	21.008	< 0.0001***				

< 0.0001***

TABLE A7 Results of one-sided paired t tests for the difference between mean part-worth utilities of different premium levels $\bar{\beta}_{km} = 1/n \cdot \sum_{i=1}^{n} \beta_{ikm}$ for term life insurance and annuity.

Note: Test results are calculated based on the empirical distribution function of β_{ikm} (i.e., the estimated values of β_{ikm} are treated as data).

30.768

***indicates significance at the 1% level.

1.505

TABLE A8 Results of one-sided paired t tests for the difference between mean part-worth utilities of different levels $\bar{\beta}_{km} = 1/n \cdot \sum_{i=1}^{n} \beta_{ikm}$ regarding the type of customer touchpoint for term life insurance and annuity.

	Term life	insurance		Annuity		
Alternative hypothesis	Diff.	t	p Value	Diff.	t	p Value
$\bar{\beta}_{\text{online+person}} > \bar{\beta}_{\text{online}}$	0.601	22.559	<0.0001***	1.358	25.455	< 0.0001***
$\bar{\beta}_{\text{online+person}} > \bar{\beta}_{\text{person}}$	1.110	23.931	<0.0001***	0.560	8.367	< 0.0001***

Note: Test results are calculated based on the empirical distribution function of β_{ikm} (i.e., the estimated values of β_{ikm} are treated as data).

***indicates significance at the 1% level.

< 0.0001***

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FIGURE A1 Median marginal willingness to pay (MWTP) (see Equation (5)) in \in for different attribute levels with 95% confidence intervals for term life insurance and annuity. The figure shows the median MWTP for the specific age groups of 40–44 years (term life insurance) and 60–64 years (annuity) for specific reference points (labeled on the y-axis) describing how much more or less the median customer is willing to pay if an attribute is changed from the given reference point to the other levels. The black whiskers represent 95% confidence intervals for the median MWTP estimated by bootstrapping under the empirical distribution function of β_{ikm} (i.e., the estimated values of β_{ikm} are treated as data) with 2500 replicates. They define the range in which the median MWTP is expected to lie with 95% probability, given the empirical distribution function of β_{ikm} .



FIGURE A2 Median marginal willingness to pay (MWTP) (see Equation (5)) in \in for different attribute levels with 95% confidence intervals for term life insurance and annuity. The figure shows the median MWTP for the specific age groups of 30–34 years (term life insurance) and 70–74 years (annuity) for specific reference points (labeled on the y-axis) describing how much more or less the median customer is willing to pay if an attribute is changed from the given reference point to the other levels. The black whiskers represent 95% confidence intervals for the median MWTP estimated by bootstrapping under the empirical distribution function of β_{ikm} (i.e., the estimated values of β_{ikm} are treated as data) with 2500 replicates. They define the range in which the median MWTP is expected to lie with 95% probability, given the empirical distribution function of β_{ikm} .



FIGURE A3 Median marginal willingness to pay (MWTP) (see Equation (5)) in \in for different attribute levels with 95% confidence intervals for term life insurance and annuity. The figure shows the median MWTP for the specific age groups of 25–29 years (term life insurance) and 75–79 years (annuity) for specific reference points (labeled on the y-axis) describing how much more or less the median customer is willing to pay if an attribute is changed from the given reference point to the other levels. The black whiskers represent 95% confidence intervals for the median MWTP estimated by bootstrapping under the empirical distribution function of β_{ikm} (i.e., the estimated values of β_{ikm} are treated as data) with 2500 replicates. They define the range in which the median MWTP is expected to lie with 95% probability, given the empirical distribution function of β_{ikm} .