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ABHANDLUNG

## Price presentation and consumers' choice

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**Abstract** Currently, regulatory authorities and consumers ask for more cost transparency with respect to financial product components. In life insurance, for instance, the premium for products should be split in its components: A premium for death benefits, the savings premium, the cost of an investment guarantee, and the administration costs. In this regard, it is important for insurance companies and regulators to know to what extent the way of presenting the prices of an offer affects consumer evaluation of the product. Based on a paper by Huber et al. (How do price presentation effects influence consumer choice? The case of life insurance products. Working paper, 2011) as presented at the annual meeting of Deutscher Verein für Versicherungswissenschaft in 2011, this article presents the effects of different forms of presenting the price of life insurance contract components and especially of investment guarantees on consumer evaluation of this product. This is done by means of an experimental study using a representative panel for Switzerland and by focusing on unit-linked life insurance products. The findings reveal that, contrary to consumer products, there is no effect of price bundling and price optic on consumer evaluation and purchase intention for life insurance products. However, there is a significant moderating effect of consumer experience with insurance products on this relationship.

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**Zusammenfassung** Derzeit fordern Versicherungsaufsichtsbehörden und Konsumentenschützer verstärkt eine Kostenaufschlüsselung von Finanzprodukten bezüglich ihrer Produktkomponenten und deren Preise. Für Lebensversicherungsprodukte lässt sich beispielsweise die Gesamtprämie in eine Todesfallprämie, die Sparprämie, die Kosten für die gewährten Finanzgarantien und die Betriebskosten aufschlüsseln. Für Versicherungsunternehmen wie auch für die Aufsicht ist es wichtig zu wissen, inwieweit die Preisdarstellung eines Versicherungsprodukts die Bewertung des Konsumenten beeinflusst. Basierend auf dem Arbeitspapier von Huber et al. (How do price presentation effects influence consumer choice? The case of life insurance products. Working paper, 2011), das im Rahmen der Jahrestagung 2011 des Deutschen Vereins für Versicherungswissenschaft vorgestellt wurde, zeigt der vorliegende Beitrag anhand eines Experiments – unter Zuhilfenahme einer repräsentativen Stichprobe für die Schweiz – den Effekt verschiedener Formen von Preisdarstellungen von Versicherungsvertragskomponenten einer fondsgebundenen Lebensversicherung mit Investmentgarantie auf die Konsumentenbewertung des jeweiligen Produktangebots. Als Hauptergebnis der Analysen lässt sich festhalten, dass Preisbündelung oder Preisoptik bei fondsgebundenen Lebensversicherungsprodukten im Gegensatz zu Konsumgütern keinen Effekt auf die Produktbewertung des Konsumenten hat. Allerdings zeigt sich ein signifikanter Moderationseffekt bei Konsumentenerfahrung mit Versicherungsprodukten.

## 1 Introduction

In the competition between insurance companies with respect to gaining and keeping new customers, an attractive product design becomes increasingly important. Due to demographic change and a declining confidence in state-run pension schemes, this holds true in particular for the case of life insurance products. In this case, the product design could be enhanced by using marketing mix strategies. For instance, insurers can add certain product features to the base contract such as investment guarantees, or use different price presentation strategies. Especially as a consequence of the financial crisis of 2007–2009, investment guarantees in the savings part of a life insurance product or in unit-linked life insurance products in particular may be of substantial value for customers, as they ensure that at least a minimum amount is remunerated, even if the value of the mutual fund falls below a predefined guarantee level. Furthermore, as e.g. the case of the car industry shows, different price presentation formats might have a substantial impact on consumers' product evaluation and purchase intention. In this respect, current regulatory efforts in most countries of the European Union intend to require insurance companies to provide a more detailed price presentation, including administration costs, to their consumers.

Hence, in this paper, we summarize the main results of the study by Huber et al. (2011) by analyzing consumers' product evaluation regarding different forms of price presentation, namely price bundling and price optic. By using an experimental between-subject design with a representative sample for Switzerland, the paper examines whether different forms of price presentations—i.e. a single up-front

payment for the guarantee, monthly payments, or the guarantee price defined as an annual percentage of the value of the mutual fund,—or different forms of price bundling—i.e. showing the total price of the product versus viewing the prices of all individual product components (i.e., term life insurance costs, investment guarantee costs, and administration costs)—will influence consumers' product evaluation.

The remainder of the paper is structured as follows. Section 2 contains the theoretical background, the model framework, and the hypotheses based on the relevant literature. Section 3 presents the experimental study design, Sect. 4 discusses the main results, and Sect. 5 summarizes the findings and provides implications.

## 2 Theoretical background, model framework, and hypotheses

### 2.1 Framing and mental accounting

When making decisions and particularly regarding risky or probabilistic choices, individuals use different mental models, which often contradict the basic principles of expected utility theory (see, e.g., Tversky and Kahneman 1974). The literature stream based on the theoretical breakthrough of Kahneman and Tversky's prospect theory (Kahneman and Tversky 1979) examined this phenomenon in detail and detected many biases and heuristics (for an overview, see, for instance Camerer and Loewenstein 2003). In the case of presenting price information, especially framing, i.e., the reliance on how information is presented (Tversky and Kahneman 1981, 1986; Kahneman and Tversky 1984), and mental accounting, i.e., the dividing of current and future assets into separate, non-transferable portions (Thaler 1999), play an important role in the evaluation of product offers. Framing the same problem differently leads to different perceptions of the decision problem and evaluation of probabilities and outcomes (Tversky and Kahneman 1981). This irrational behavior also proves true in the financial decision making process with risky or probabilistic choices (Johnson et al. 1993; Wakker et al. 1997). Thus, presenting price information of the components of an insurance contract differently may lead to a different evaluation of the product, even though all products have identical present values.

Furthermore, mental accounting plays an important role in consumer evaluation of price information. Mental accounting builds upon the properties of prospect theory and its value function, introduced by Kahneman and Tversky's prospect theory (Kahneman and Tversky 1979; Tversky and Kahneman 1991, 1992). According to this value function, it predicts that gains (losses) have a higher (lower) value if separately presented, instead of in a combination (Thaler 1985, 1999). Thus, in the case of gains, consumers prefer to separate two positive events, thus obtaining several small gains rather than the whole sum. In the case of losses, consumers prefer one single loss rather than several small losses of the same amount. Particularly the latter has to be considered in the model framework, since premiums are assumed to be paid for insurance contracts (and especially for investment guarantees) are perceived more as losses than as gains or savings. This implies that consumers' evaluation of the product

offers should be more positive for products with a bundled price presentation than for products with a debundled price information, i.e., showing the prices of the several contract components.

The literature stream on price presentations shows that consumers are generally sensitive to price presentation effects and the framing of price information (partitioned vs. consolidated prices), see, for example, Bauer et al. 2006; Chakravarti et al. 2002; Drumwright 1992; Johnson et al. 1999; Puto 1987; Yadav and Monroe 1993. Thus, price presentation plays an important role in pricing policies regarding the subjective perception of consumers (Diller 2000; Diller and Herrmann 2003). Bundling, i.e., packaging two or more services or products, often for a special price (Guiltinan 1987), is used in many industries as a successful marketing strategy. Academic literature investigated mainly how products and services can be optimally combined (Hanson and Martin 1990; Bell 1986; Guiltinan 1987). Furthermore, psychological aspects have been examined, particularly regarding the evaluation process of bundled products, such as, for example, anchoring and adjusting models (see for example, Gaeth et al. 1991; Yadav 1994). The theoretical basis for the psychological research stream builds upon the above explained prospect theory and mental accounting and uses reference price concepts. Additionally, academic literature emphasizes the consumers' evaluation of bundled offers and the importance of price presentation and framing effects (Johnson et al. 1999; Mazumdar and Jun 1993; Yadav and Monroe 1993; Yadav 1994).

However, the research stream on price bundling often focuses on the effect of embedded price discounts and the perceived savings (for an overview, see, for example, Krishna et al. 2002). Chakravarti et al. (2002) and Morwitz et al. (1998) investigate the effects on consumers' evaluation of partitioned prices, i.e., of separate prices for each component (vs. consolidated prices, i.e., a single, equivalent price) and show that there is a lower price perception and a higher repurchase intention if price information is partitioned. Contradictory to these studies are the results of Beshears et al. (2010). Investigating retirement saving products, they find that an increase of cost transparency, which corresponds to partitioned price information, does not affect portfolio choice. Thus, the above findings may differ in the case of long-term saving products, such as, for example, life insurance products. However, aside from this study, little research has been conducted to investigate the role of price presentation and price bundling in long-term saving products, and particularly in unit-linked life insurance products and their effect on consumer evaluation. An overview of heuristics and biases for these products is presented by Benartzi and Thaler (2007).

Thus, in Huber et al. (2011), the aim is to investigate whether or not consumers' evaluations vary if the price information of a life insurance contract is differently presented and the sum of the bundled components and the total price are exactly equivalent. Hence, it is analyzed whether there is a price presentation format (regarding price framing, price bundling) that consumers prefer in the case of long-term saving products. In this context, the following hypotheses are assumed:<sup>1</sup>

H1a: Positive consumer evaluations of an investment product augment, as price information is bundled. This comprises (i) the perceived satisfaction with the

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<sup>1</sup> Here, only three out of eight hypotheses are presented; for the full study, we refer to Huber et al. (2011).

product and (ii) the perceived likelihood of recommending the product to other people.

H1b: Positive consumer evaluations of an investment product augment, as price information is abstract. This comprises (i) the perceived satisfaction with the product and (ii) the perceived likelihood of recommending the product to other people.

The alternative hypotheses predict that the bundling or abstracting of price information have no effect on consumer evaluations.

H2: Consumer experience with insurance or investment products moderates the effects of bundling on consumer satisfaction. Specifically experienced consumers are more satisfied if prices are presented as a bundle and less satisfied if the prices are presented unbundled, whereas less experienced consumers do not show different reactions to different price bundling presentations.

The alternative hypotheses predict that experience has no moderating effect.

### 3 Experimental study

#### 3.1 Experimental design, sample and measures

To test these hypotheses, an experimental design is used, out of whom two studies are presented in this short version (see Fig. 1). The overall experimental design consisted of an online survey (originally in German and French) in which the evaluation of the product cards has been embedded (see Huber et al. 2011). The sample of  $n = 647$  is representative for Switzerland regarding gender (male = 50.5%; female = 49.5%) and region (here only focusing the German (70.5%) and the French (28.6%) speaking part of Switzerland). Due to the calibration features, focus was laid on 25 to 35 year olds regarding the age of the participants. Thus, there is a subsample of around  $n = 55$  for each product card (see Table 1).

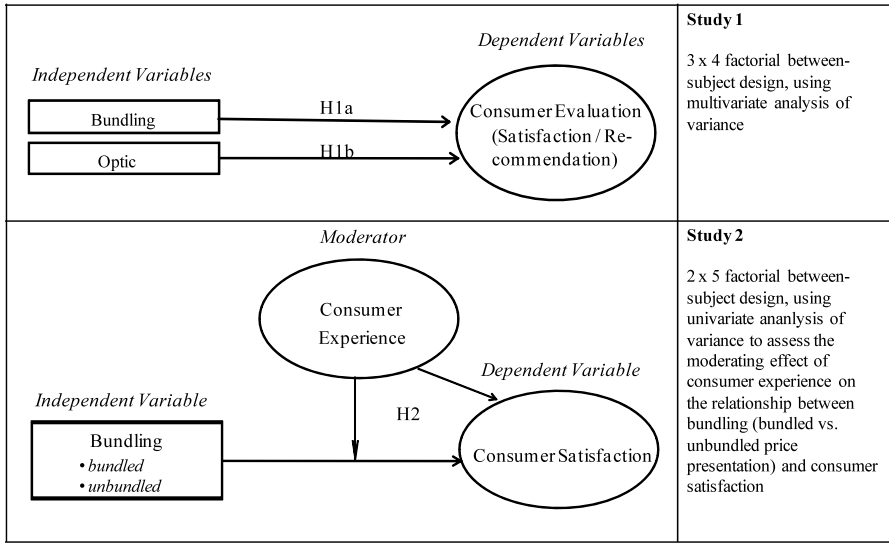
The survey was divided into two sections. In the first section, a product card has been shown to the participants for evaluation. Every subsample only received one product card for evaluation. The consumer evaluation included three dependent variables (see Johnson et al. 1999):

- the perceived satisfaction with the offer, measured on a 5 point scale from 1 (not satisfied) to 5 (satisfied),
- the likelihood of recommending the offer, measured on a 5 point scale from 1 (disagree) to 5 (agree),
- and the purchase intention, measured on a binary scale from 0 (no) to 1 (yes).<sup>2</sup>

In the second section of the survey, the moderating variable “consumers’ experience with financial and insurance products” has been measured, including multiple measures regarding:

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<sup>2</sup>For the analyses regarding purchase intention, please refer to Huber et al. (2011).



**Fig. 1** Model framework (short version, see Huber et al. 2011)

**Table 1** Calibrated premiums per product offer (payments per month if not stated differently; see Huber et al. 2011)

Price bundling factor	Price optic factor			
	No guarantee	Guarantee level: 12,000		
		Single up-front guarantee costs	Monthly guarantee costs	Guarantee costs in % of the annual fund value
Bundling ( $P$ )	Offer 1 100	Offer 4 100 + 644 in the first month	Offer 7 105	Offer 10 105 + 1% p.a.
Partial bundling	Offer 2	Offer 5	Offer 8	Offer 11
Base contract ( $P$ )	100	100	100	105
Inv. guarantee costs ( $P_G, a$ )	0	544 up-front	5	1% p.a
No bundling	Offer 3	Offer 6	Offer 9	Offer 12
Risk premium ( $P_D$ )	1	1	1	1
Savings premium ( $P_s$ )	91	91	91	96
Administrative costs ( $kP$ )	8	8	8	8
Inv. guarantee costs ( $P_G, a$ )	0	544 up-front	5	1% p.a

- expertise in general using the items of Mishra et al. (1993),
- expertise on a personal level using the items of Mitchell and Dacin (1996),
- expertise regarding the product prices using the items of Kopalle and Lindsey-Mullikin (2003).

These items have been adjusted to the insurance and financial product context and the scales have been unified to a five-point scale ranging from 1 (disagree) to 5 (agree).

### 3.2 Manipulation of the independent variables: modeling the unit-linked life insurance contracts and calibration features

Regarding the manipulations of the independent variables, two factors are used: The *bundling factor*, which consists of a single bundled price for the unit-linked life insurance product and the investment guarantee, a partially bundled price with separate prices for the base contract and the guarantee, and a debundled price presentation with separate prices for the guarantee, the risk premium, the savings premium, and the administration costs. The *optic factor* consists of a product without any guarantee (and thus, no guarantee costs; this product serves as contrast product), a product with an investment guarantee presented as single up-front guarantee cost, a product with monthly guarantee costs, and a product with guarantee costs as a % of the annual fund value. Thus, a 3 (bundling: bundled price vs. partially bundled price vs. debundled price)  $\times$  4 (price optic: no guarantee vs. guarantee with single up-front costs vs. guarantee with monthly cost vs. guarantee with costs in percent of the annual fund value) between-subject design is found, consisting of twelve different variations of price information (see Table 1).

To determine different price optic and bundling of investment guarantees in unit-linked life insurance policies, first, a unit-linked base contract without guarantee is modeled that contains a savings part invested in a mutual fund and a fixed death benefit  $D$  that is paid out if the policyholder dies during the term of the contract. In case of survival until maturity  $T$ , the policyholder receives the value of the mutual fund, which yields a stochastic payoff at maturity in case of the the base contract. For administration costs, a percentage  $k$  of the gross premium  $P$  is charged. The risk premium for the death benefit payment is denoted by  $P_D$  and subtracted from the gross premium. The remainder constitutes the savings part and is invested in the mutual fund. To ensure a minimum survival payoff, the base contract is then extended to further offer a constant guaranteed minimum payoff  $G_T$  for an additional guarantee price  $P_G$ . The total premium paid into the contract including the additional costs for an investment guarantee can thus overall be split up into four components (Table 1). A detailed and formal derivation of the prices can be found in Huber et al. (2011).

In calculating the contract features, an actuarial pricing approach is used for the base contract to determine the risk premium for the death benefit and the table of the German Actuarial Association DAV 2008 T for the mortality rates. Furthermore, for the underlying mutual fund, we refer to the model framework as described in Gatzert and Schmeiser (2009). The investment guarantee in the savings part is determined by using a risk-neutral valuation, assuming that the fair price is the reservation price for an insurance company. Due to different price presentation formats of the guarantee costs, an absolute amount is considered, using the gross premium (respectively the sum of the gross premiums) and an annual percentage fee, which in the present setting corresponds to a guaranteed interest rate of 1.68% on the savings part. Both fees are modeled such that the present values are identical. To summarize, it is ensured that

the guarantee costs are the same and only the price presentation differs (absolute costs as single and annual premium and annual percentage fee of the fund value) in order to isolate the effect of the price presentation on consumer choice.

For the empirical survey, the model is calibrated as follows: Contract duration  $T = 10$  years, age of the male insured  $x = 30$  years, the gross premium  $P = 100$ , administrative costs  $k = 8\%$ , and the guarantee  $G_T = 12,000$  (sum of gross premiums). The input parameters of the underlying mutual are based on Gatzert et al. (2011) (medium-risk fund), with  $\sigma = 8.61\%$ , a continuous riskless rate of return of  $r = 2.15\%$ , and the corresponding discrete riskless rate of  $r_D = \exp(r) - 1 = 2.17\%$ . To enhance the understandability of the product, monthly premiums are provided in the questionnaire and approximated by  $P^{\text{monthly}} = P^{\text{annual}}/12$ . The resulting prices regarding different types of price optic and price bundling for the different product offers are laid out in Table 1.

## 4 Results

*Study 1: Basic model using MANOVA* In the first study, multivariate analyses of variance (MANOVA) models are used to test the hypotheses regarding consumer evaluation, based on consumer satisfaction and likelihood of recommending. Hypothesis 1a predicts that consumer evaluation of the product augments as price information is bundled. MANOVA analyses show that there was no significant effect of the price bundling dimension on consumer evaluation, as  $F(df = 4, \text{error } df = 1270) = 0.363$ ,  $p = .835$ , using Pillai's trace criterion. This implies that there are no significant differences between bundled, partially bundled, and debundled price conditions regarding the satisfaction with the product and the likelihood of recommending. Thus, Hypothesis 1a has to be rejected.

Hypothesis 1b predicts that positive consumer evaluations of an investment product augment as price information is abstract. Pillai's trace does not show any significant differences between no guarantee cost, the initial up-front premium, monthly guarantee costs or guarantee costs as a percentage, regarding the satisfaction with the product and the likelihood of recommending,  $F(df = 6, \text{error } df = 1270) = 0.859$ ,  $p = .525$ . Therefore, Hypothesis 1b must be rejected as well. Furthermore, there is no interaction between price bundling and price optic,  $F(df = 12, \text{error } df = 1270) = 0.727$ ,  $p = .726$ , using Pillai's trace. Further, the between-subject effects also do not show a significant effect.

*Study 2: Moderated model* To understand the key drivers of different forms of price presentations on consumer evaluation, the model is reduced to its most basic components. Thus, for the independent variables, the "bundling" factor is reduced to the two extreme categories, namely 1 = unbundled price presentation and 2 = bundled price presentation.<sup>3</sup> Consumer satisfaction with the product serves as the dependent

<sup>3</sup>Similarly, the optic factor is reduced into two extreme categories, i.e. 1 = without guarantee and 2 = with guarantee. Similar results could be found for the 2 (bundling: unbundled vs. bundled)  $\times$  2 (guarantee: without guarantee vs. with guarantee) between-subject factorial design (see Huber et al. 2011).



variable. Furthermore, the model is extended by using experience as a moderator to gain further insight into the relationship between price presentation and consumer satisfaction. To derive this factor, a principal component analysis with orthogonal rotation on the collected items is conducted with respect to the participants' experience with insurance and financial products, resulting in a satisfactory reliability level of  $\alpha = .89$ . This factor is recoded on a five-point scale from 1 = 'less experienced' to 5 = 'very experienced' (for the full analysis, see Huber et al. 2011). Hypothesis 2 predicts that consumer experience with insurance or investment products will moderate the effects of bundling on consumer satisfaction. Specifically, experienced consumers will be more satisfied if prices are presented as a bundle and less satisfied if prices are presented unbundled, whereas less experienced consumers will not show different reactions to different price bundling presentations.

The results from this analysis reveal a statistically significant interaction between the bundling factor and the moderator experience ( $F_{\text{Interaction}}(df = 4) = 2.58$ ,  $p = .04$ ), thus confirming a moderating effect of experience on the relationship between bundling and consumer satisfaction. In addition, a simple effect analysis allows an assessment of the interaction term. Looking at the significant values for each simple effect, there is a significant difference between experienced and less experienced consumers for the unbundled price presentation ( $F(df = 4) = 2.23$ ,  $p = .07$ ) and no significant difference for the bundled price presentation ( $F(df = 4) = 1.6$ ,  $p = .17$ ). Similarly, a difference in consumer satisfaction between bundled and unbundled price presentation can be observed at levels 1, 3 and 5 of experience. Thus, the mean satisfaction for very experienced consumers is considerably lower for unbundled price presentation than for bundled price presentation, confirming Hypothesis 2. The results of the moderated model indicate that consumer experience with insurance or investment products contributes significantly to the relationship of price bundling and consumer satisfaction. Particularly, very experienced consumers are less satisfied with the product if prices are presented unbundled or additional investment guarantees are embedded. Further analysis are provided in Huber et al. (2011).

## 5 Implications and summary

Based at Huber et al. (2011), this paper examines whether consumer evaluation (satisfaction and recommendation) and purchase intention for investment guarantees embedded in unit-linked life insurance products depend on different forms of price presentation (bundling and optic) of the guarantee costs by means of an experimental study for a representative Swiss panel. The prices for the guarantees are calculated using risk-neutral valuation and the fair price is interpreted as a reservation price for an insurance company offering these kinds of guarantees to their consumers. In a next step, an analysis whether different forms of price presentations (i.e., single up-front payment for the guarantee; monthly payment; guarantee price as a percentage of the value of the mutual funds) influence consumers' decision and evaluation of the contract is obtained. In addition, different forms of product bundling with respect to the price presentation are considered. Here, products with identical present values are offered to the participants of the experimental study showing the overall price of the

product versus viewing the pricing of the different product components (term life insurance with risk premium and savings premium, investment guarantee in the savings part, administration costs).

In regard to price presentation, it turned out from the empirical analysis that neither price bundling nor price optic had a statistically significant effect on consumer evaluation, or on consumer purchase intention of the product. No statistically significant differences between the bundled, partially bundled and debundled pricing forms can be confirmed in this analysis. In addition, combinations of different forms of price optic (guarantee prices in different absolute and relative terms) had no substantial impact on the decisions of the participants. Hence, these findings differ in relation to the outcomes of similar empirical studies in the area of consumer goods (see, for example, Johnson et al. 1999).

However, consumers' experience with insurance or investment products turned out to be highly statistically significant predictors for explaining the relationship between the product offer with its price presentation and consumer evaluation of the product. Here, very experienced participants were less satisfied with a product if prices were presented unbundled or if additional investment guarantees were embedded, whereas the differences in product offer evaluations of less experienced participants were not significant.

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