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Determinants of customer price sensitivity: An empirical analysis

1. INTRODUCTION

In late 2007, a subprime crisis was triggered in the United States of America, creating one of the most severe financial crises. Globalization quickly brought the crisis to the European economies, creating problems in financial markets and enormous mistrust due to the uncertainty and incapacity to develop medium- to long-term action plans.

In this sense, the insurance sector plays a major role in leveraging the economies of many countries, providing stability and confidence in markets (e.g., buying sovereign debt). In the specific context of the industries operating within services (e.g., utilities, healthcare, financial services, insurance, etc.), the relationship between consumers and organizations is very dynamic (Bolton and Lemon, 1999).

Many factors influence the buying decisions of customers and price sensitivity in the insurance industry, including premiums (Barroso and Picón, 2012; Rai and Medha, 2013), intermediary recommendations (O'Loughlin and Szmigin, 2007; Robson and Sekhon, 2011; Brophy, 2013a), involvement (Zaichkowsky, 1988; Datta, 2003), and pricing strategies such as price bundling (Weston, 2007, as cited in Brophy, 2014b).

Related to premiums, Barroso and Picón (2012) found that the price paid for insurance products is very important with regard to a Spanish insurance customer's perception of time, money, or the effort involved in switching. Related to that, Rai and Medha (2013) found that premiums play an important role in the loyalty of insurance customers. Along these lines, the present article aims to measure the importance that Portuguese insurance customers give to premiums.

Related to insurance distribution, an intermediary's recommendation plays an important role in insurance sales (see O'Loughlin and Szmigin, 2007; Robson and Sekhon, 2011; Brophy, 2013a). Because in Portugal insurance intermediaries are market leaders in terms of sales (see Table 1), this investigation analyzes the importance of intermediary recommendations in a customer's buying decision process.

Table 1: Structure of insurance distribution channels in 2013 (Portuguese Association of Insurance, 2014)

Concerning consumer involvement, the literature states that customers having a greater involvement with a product are less sensitive to price (see Zaichkowsky, 1988; Datta, 2003). In this context, this investigation analyzes how different levels of financial involvement (low or below average vs. high or above average) actually affect consumer price sensitivity.

Another factor that affects consumer price sensitivity is loyalty. Several studies show that loyal customers are very important because they contribute to increasing corporate profits (Reichheld and Sasser, 1990; Bennett and Rundle-Theile, 2005; Rauyruen and Miller, 2007), they spend more than nonloyal customers (Russell-Bennett, McColl-Kennedy and Coote, 2007), and also because they tend to be less sensitive to price (e.g., Ramirez and Goldsmith, 2009; Yoon and Tran, 2011; Roy, 2012), with special relevance in the insurance industry (O'Loughlin and Szmigin, 2007; Robson and Sekhon, 2011; Brophy, 2011; Rai and Medha, 2013; Brophy, 2013a; Brophy, 2013b). Because the insurance sector has one of the highest churn rates (Jacada, 2008; Deloitte, 2012; Soeini and Rodpysh, 2012), the present paper also investigates and compares the price sensitivity of loyal customers vs. nonloyal consumers.

Finally, the present paper also explores the possible benefits of implementing a price-bundling strategy in the insurance sector; specifically, combining home insurance (noncompulsory) with auto insurance (compulsory).

Therefore, the main contribution of this study is to bridge a gap in the service marketing literature related to the insurance industry that is less studied, i.e., consumer price sensitivity. For example, the role played by customer loyalty behaviors or even the role of bundling strategies in consumer price sensitivity is a less-studied issue in the insurance industry. One of the reasons leading to the low number of studies that focus on this issue is the strict regulation insurance premiums (especially motor insurance) in some countries (see Cummins and Tennyson, 1992; Tennyson, 1997; Weiss, Tennyson and Regan, 2010; Derrig and Tennyson, 2011; Brophy, 2012).

Regulation of premiums for automobile insurance

Automobile insurance is compulsory in countries such as the United States of America, United Kingdom, Germany, France, Spain, and Portugal. This being the case, and using the words of Weiss, Tennyson, and Regan (2010):

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> Automobile insurance is a compulsory purchase for most drivers in the United States and represents a significant expense for many. Partly because of this, many states regulate automobile insurance prices. Although there are several stated goals of automobile insurance regulation, the objective of much rate regulation is premium affordability.

In this sense, regulators intend to achieve adequate automobile insurance rates, i.e., "that insurance is readily available in the market, but not so high that insurance is unaffordable to drivers" (Weiss, Tennyson, and Regan, 2010). However, it is frequent that this regulation process produces a significant adverse impact on insurance costs (see Tennyson, Weiss, and Regan, 2002; Derrig and Tennyson, 2011). But, according to Llewellyn (1999, as cited in Brophy, 2014a), the reasons for regulation of financial services are as follows:

- To sustain systemic stability; □
- To maintain the safety and soundness of financial institutions; and □
- To protect the consumer. □

In this context, the level of auto insurance premium regulation strongly influences an insurer's degree of freedom when determining premium levels. However, the insurance sector in Portugal does not have such strict regulations. Only recently, the former Portuguese Institute of Insurance changed its designation to Portuguese Insurance and Pensions Funds Supervision Authority (Autoridade de Supervisão de Seguros e Fundos de Pensões). This change to "supervisory authority" is being perceived by insurers and intermediaries as an indication of the power of regulation, because of the severe financial crisis of the last years. This supervisory authority bases its regulation on having a minimum premium, to maintain the safety and soundness of the financial institutions, i.e., the insurance industry as a whole.

In short, the objectives of this paper are twofold:

- To measure the importance of certain attributes on the global purchasing behavior process of insurance customers (studied attributes are premiums,

insurers, intermediary recommendation, and price-bundling strategies). This is a very important issue for actuaries, as they have to understand the importance or contribution of a specific goal to the overall decision (Brockett and Xia, 1995).

- To study the effect of bundling strategies on retention of customers, on the one hand, and on attracting new customers, on the other.

2. THEORETICAL FRAMEWORK

2.1. Pricing and Price Sensitivity

Pricing has been a much-discussed subject over the past few decades for two reasons. First, because of its direct impact on the revenues of enterprises; and second, because it is difficult to estimate (Ferrell and Hartline, 2005). On this last issue, not every consumer is willing to pay the same price for a given product, which increases the difficulty of setting the "right price" (Ramirez and Goldsmith, 2009).

Consequently, it is important to understand how consumers react to different prices and which are the relevant factors affecting those reactions. According to Ferrell and Hartline (2005), pricing strategy involves both market acceptance and the overall profits of companies. The more information managers have about ratings and the reactions of consumers over the price, the higher the success in responding to the goals of corporate profitability (Ramirez and Goldsmith, 2009). Two important concepts arise in this context as follows:

- Price elasticity is an aggregate measure related to the market as a whole and does not inform how individuals or specific groups (clusters) react to a certain price. Economists consider price elasticity an essential element (Ramirez and Goldsmith, 2009).
- Price sensitivity reflects how consumers feel about paying a certain price for a product. In addition, individual reactions to price are very useful for marketing purposes (Goldsmith and Newell, 1997).

Managers need detailed information about the elements that influence consumer price sensitivity in order to understand how to increase product attractiveness without reducing the selling price (Ramirez and Goldsmith, 2009) or to be able to compensate

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for a price increase with a reinforced mix of alternative attributes valued by consumers. Ramirez and Goldsmith (2009) propose a model to measure price sensitivity based on four elements as follows:

I. The perceived similarity between brands

Perceived similarity between brands can be defined as the consumers' global perception that differences between products of different brands are small (Iyer and Muncy, 2005). The more different a brand is perceived, the more consumers are willing to pay more for a product of a certain brand (the opposite also occurs). In this context, consumers become more sensitive to price (less willing to pay a price) when they perceive few differences between brands (Light, 1997).

Given the exploratory nature of this study, it is unclear whether this element is critical in the case of the Portuguese insurance sector. Also, because auto insurance is compulsory and there is a standard core (after decree-law no. 72/2008, April 16th), it seems that insurer brands are perceived with great similarity. In addition, the results of this study confirm that brand (insurer) is not a significant attribute for consumers.

II. Innovative consumers

Innovative consumers always want the latest products (Goldsmith and Hofacker, 1991) and they also use products more frequently, researching a greater amount of information about a product category (Goldsmith, 2000; Goldsmith, 2002). Several studies show a negative correlation between innovation and price sensitivity (Goldsmith and Newell, 1997).

In the context of this study, the level of innovation of auto insurance in Portugal is virtually nonexistent. In this regard and in order to maximize the parsimony of the methodology used, the authors decided not to incorporate this element in this investigation. Also, innovation does not seem to be significant in auto insurance because there is an automatic repurchase due to the compulsory nature of this product.

III. Involvement with the product

The more involved consumers are with a product, the less sensitive they are about price (Zaichkowsky, 1988; Datta, 2003). However, involvement is a multidimensional

construct, based on cognitive and affective dimensions (Richins, Bloch, and McQuarrie, 1992). A person can present different kinds of involvement as follows:

- With advertisements (Krugman, 1977);
- With products (Hupfer and Gardner, 1971);
- With purchase decisions (Clarke and Belk, 1978).

Involvement can also be analyzed from a different level, specifically between customers and firms (Goodman *et al.*, 1995). Also, highly involved individuals invest more time and energy in their relationship with a firm. According to Knox and Walker (2003), customer involvement affects the final decision during the purchasing procedure, and the more involved customer tends to be more loyal. According to Russell-Bennett, McColl-Kennedy, and Coote (2007) "the level of involvement determines the level of decision importance in the purchasing process, and business customers are likely to display attitudinal loyalty for high involvement purchases". For example, "price endings" can decrease high-price perception (see Shoemaker *et al.*, 2003; Chang and Chen, 2014; Choi *et al.*, 2014). According to Rao and Kartono (2009, p.30), customer involvement is also related to the degree of customer involvement with the pricing decision:

> When firms know where their customers come from and are more confident about their projected sales figures, they can more easily set a price that is more acceptable to customers and at the same time minimizes risks to profitability. Accordingly, in terms of respondent characteristics, the higher the degree of involvement of the respondent with the pricing decision, the more likely it is for the firm to practice perceived value pricing, since this method requires a more flexible approach to pricing.

In this study, authors use this measure of customer involvement, concretely, the financial involvement of customers with pricing decisions.

Hypothesis 1: *Customers with a higher financial involvement with products are less price sensitive.*

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IV. Brand loyalty

Jacoby (1975) defines loyalty as a higher probability of a consumer purchasing products from a particular brand, resulting in consistent purchase behavior over time (see also Dick and Basu 1994; Rauyruen and Miller, 2007). This scenario affects both sales volumes of companies as well as profits (Bennett and Rundle-Theile, 2005). Customer retention is more positive to profits than market share or even scale economies (Reichheld and Sasser, 1990). On the contrary, nonloyal consumers tend to switch brands as a result of either the desire for variety or the chase for promotional incentives (Yoon and Tran, 2011).

Several studies show that loyal customers are less sensitive to price (Brown, 1974; Krishnamurthi and Raj, 1991; Yu and Dean, 2001; Bloemer and Odekerken-Schröder, 2002; Rowley, 2005; Ibrahim and Najjar, 2008; Gázquez-Abad and Sánchez-Pérez, 2009; Ramirez and Goldsmith, 2009; Yoon and Tran, 2011; Li, Green, Farazmand, and Grodzki, 2012; Roy, 2012). Loyal insurance customers are also less sensitive to price (O'Loughlin and Szmigin, 2007; Robson and Sekhon, 2011; Brophy, 2011; Rai and Medha, 2013; Brophy, 2013a). As mentioned by Yoon and Tran (2011), loyal consumers are insensitive to the preferred brand's price.

According to Reichheld and Teal (1996), loyal customers are important in terms of customer relationship activities, value creation programs, and marketing strategies. Also, loyal customers are likely to purchase more frequently, try the firms' other products, and bring new customers to the firm (Li et al., 2012).

In this sense, the authors investigated whether loyal insurance customers really are less sensitive to price.

***Hypothesis 2**: Loyal customers are less price sensitive.*

In this context, this study analyzes whether a price-bundling strategy can decrease consumer price sensitivity.

2.2. Bundling

There are many other elements that affect consumer price sensitivity and the market share of brands (see Tung *et al.,* 1997). So, will discounts reduce consumer price sensitivity? From the perspective of retailers, revenues are more "closely linked to overall category sales than to the sales of any particular brand" (Raju, 1992). According to Schultz (1990, as cited in Raju, 1992), many of the promotional programs that lead to brand switching are of little use to the retailer. Still, bulky categories or categories with high competitiveness exhibit significantly lower variability in sales (Raju, 1992). This could probably be the case in the insurance industry. However, there are different kinds of price promotions such as:

- The magnitude of the discounts (see Golabi, 1985; Assunção, and Meyer, 1990); and
- The frequency of the discounts (see Assunção and Meyer, 1990).

Adams and Yellen (1976) define bundling as the act of selling goods in packages. Later, Guiltinan (1987) added to the definition of bundling the idea of selling products and services in one package for a "special price." The basic principle of bundling strategies comes from pioneering works of mental accounting (see Thaler, 1985) as well as framing effects (Kahneman and Tversky, 1979). According to Sheikhzadeh and Elahi (2013), bundling strategies are mainly used in three situations:

- As a tool for price discrimination;
- As a cost-saving mechanism; and
- As a means of entry deterrence.

Many sectors are using bundling strategies, such as telecoms, machine tools, electronic components, chemical substances, and travel companies bundling flights, rental cars, accommodations, and events (Johnson *et al.*, 1999). It is a strategy that is increasingly utilized (Dolan and Simon, 1996; Naylor and Frank, 2001). Stremersch and Tellis (2002) presented two different bundling strategies:

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a) Product bundling – based on the principle of products that are complementary. For example, Microsoft sells the Microsoft Office software as a bundle, including Word, Excel, and PowerPoint (Gerdeman, 2013). In the economic literature the terms frequently used are "tying strategy" or "tying arrangements" (see Ferrell and Hartline, 2005, p. 286).

b) Price bundling – selling at least two products separately without integration (see also Rao and Kartono, 2009, p. 15). As mentioned by Brito and Vasconcelos (2015), bundled discounts provide purchasers with the opportunity to pay less for a bundle than the sum of the prices of the bundled products when purchased separately. Consumers are therefore faced with the choice between meeting all their requirements by buying a package at a discounted price, or purchasing items individually *à la carte*.

   In this context, Guiltinan (1987) presents two different types of price bundling:

   i. Mixed-joint bundling – there is a reduction when at least two products are purchased simultaneously but customers do not know to which one the reduction has been applied (see also Avlonitis and Indounas, 2006; Gilbride *et al.*, 2008).
   ii. Mixed-leader bundling – there is a reduction on a leader product's price if one customer buys another product (see also Gilbride *et al.*, 2008).

As pointed out by Johnson *et al.* (1999), bundled discounts increase consumer willingness to recommend and repurchase intention, i.e., loyalty behaviors. According to Harris and Blair (2012), from the retailer perspective, if consumers fail to process information about a bundle discount, optimal bundle pricing may be affected. So, why in our study did we choose car insurance as a more relevant product over home insurance? According to Yadav (1994), consumers evaluate bundled products based on an anchoring and adjustment model. In practice, customers anchor their evaluations by analyzing which product is the most important, and then they adjust their preference

considering the less important product(s). In the specific case of the Portuguese insurance sector, car insurance is the product most relevant to customers (APS, p.4, 2013) and it is compulsory. In this context, insurers make a great effort regarding the sale of home insurance. Similarly, Weston (2007, as cited in Brophy, 2014b) used motor and health insurance as the anchor products, and home insurance had a significant discount.

Therefore, the authors argue that bundling strategies could play an important role as an integrated strategy (see O'Loughlin and Szmigin, 2005), as well as increasing sales, especially to loyal customers. As Berry (2000, as cited in O'Loughlin and Szmigin, 2005) indicated, service companies should consciously pursue distinctiveness in performing and communicating service, connect emotionally with customers and internalize the brand for service providers in order to build retention and loyalty with customers. Berry also states that although the study of financial services has been more studied in the last few decades, it continues to pose challenges for marketers as an academic area of research.

In this context, the authors argue that bundling strategies allow insurers and intermediaries to increase customer retention (loyalty) by increasing their satisfaction.

Morwitz *et al*. (1998) analyzed the effect of prices on price perceptions and repurchase intentions.[1] For other examples in this field see Brough and Chernev (2012). It is also interesting to note that consumers present different reactions between partitioned and nonpartitioned or combined prices (Guiltinan, 1987; Chakravarti *et al.*, 2002; Janiszewki and Cunha, 2004; Xia and Monroe, 2004; Bertini and Wathieu, 2008).

This paper then also studies the following additional hypotheses:

> ***Hypothesis 3:*** *Loyal customers are more sensitive to price bundling strategies than nonloyal customers.*
>
> ***Hypothesis 4:*** *Partitioned prices have better acceptance than combined prices.*

3. METHODOLOGY AND DATA

[1] Morwitz *et al*. (1998) presented products to consumers as follows: i) combined price – telephone for $82.90, including shipping and handling; ii) partitioned price – telephone for $69.95 plus $12.95 surcharge for shipping and handling. The results showed that when using partitioned price, repurchase intentions were higher and price perceptions were lower.

3.1. Sample

According to the Portuguese Association of Insurance (APS, 2013), in 2013, there were 79 insurance companies operating in Portugal, 11,180 employees, and 24,624 insurance intermediaries. The top 10 most representative brands operating in Portugal are Fidelidade-Mundial, Ocidental Vida, BES Vida, Santander Totta Seguros, BPI Vida, Império Bonança, Allianz Portugal, Açoreana, AXA Portugal, and Tranquilidade.

Data were collected from 455 insurance customers (60.2% men; 39.8% women[2]), ages between 19 and 80 years (mean=43.79; standard deviation=12.159). A simple random sample was performed and the sample error was ±4.59% (p=q=50), with a confidence level of 95% (k=2 sigma). Analyzing the sample by age group:

- 11.6% of the sample was between 18 and 29 years old;
- 43.7% was between 30 and 44 years old;
- 37.7% was between 45 and 64 years old;
- 5.1% was between 65 and 74 years old;
- 1.9% was 75[3] years old or more.

3.2. Data collection

The procedure for collecting data for this study encompassed two important stages as follows:

Stage 1: The information was collected through personal interviews, using an *ad hoc* questionnaire developed specifically for this research. Interviews took approximately 20 minutes each to be completed and they were conducted during July 2013. These data were used to test hypotheses 1, 2 and 3.

Stage 2: In order to test hypothesis 4, we returned to 42 of the 455 respondents of Stage 1, asking them if they would buy a bundled product (price bundling). From those:

i. We presented a bundling strategy with partitioned price to 22 individuals.

[2] According to the European Commission (2004, 2011), there should be no gender discrimination in insurance pricing.

[3] In Portugal, there is no age limit to buy car insurance. The unique condition is to have a driving license.

ii. And a combined price to 20 other individuals.

In both stages, the authors received the support of several multibrand insurance intermediaries as far as data collection was concerned. In addition, and in order to prevent any bias in data, we trained all the managers responsible for collecting data, especially concerning Conjoint Analysis. This way, (multibrand) intermediaries knew how to correctly collect data through a simulated sale with Conjoint Analysis.

3.3. Attributes' selection

In order to select the most relevant attributes for Portuguese insurance customers, we performed a pilot study based on a qualitative approach (we conducted three focus groups with both customers and intermediaries). The results obtained show that "the intermediaries' recommendation," "price,[4]" and "insurer/brand" were the most relevant attributes for Portuguese customers.

3.4. Procedure

A Conjoint Analysis with Full Profile (FP) was performed in order to achieve the conditions most similar to a selling environment (other investigations used the same logic, e.g., Gareth, Levin, Chakraborty, and Levin, 1990). According to Green and Srinivasan (1978), Conjoint Analysis is "a decompositional method that estimates the structure of a consumer's preferences given his/her overall evaluations of a set of alternatives that are previously specified in terms of levels of different attributes". Conjoint analysis is a very interesting technique for evaluating and analyzing consumer preferences regarding products or services (Varela, Picón and Braña, 2004; Dominique-Ferreira, Rial and Varela, 2012).

Authors considered the possibility of using a choice-based conjoint. However, intermediaries who participated in data collection indicated that the FP option would mimic in a better way the decision-making process of customers. Also, other studies support good performance from FP predicting consumer preferences (Molin, Oppewal, and Timmermans 2000; Oppewal and Klabbers, 2003). In the specific case of pricing

[4] Respondents were informed about covers associated with each level of the attribute premium.

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studies, Conjoint Analysis is one of the most popular methods in marketing for measuring willingness to purchase (Jedidi and Jaspal, 2009, p. 42).

Therefore, the subjects were asked to sort the cards based on their preferences. This procedure is called Full Profile, with simulated stimuli and sort cards – sequence. The selected attributes were:

Table 2: Attributes and corresponding levels

To achieve the Conjoint Analysis we selected these four attributes with different levels for each (2×4×4×2). From the 64 possible combinations, we used an orthogonal fractional factorial design, selecting 16 and two holdout cards, which were eventually used in the data collection (with an *Orthoplan* procedure of the SPSS software). We built 18 cards, each one representing one of the 18 combinations of attribute levels.

Because we performed a *post hoc* segmentation (see Green, 1977; Wind 1978; Picón, Varela, and Real, 2005), the Clustering Algorithm was applied to the output of the Conjoint Analysis. Therefore, we carried out a two-stage clustering, starting with a hierarchical method (Euclidean distance) and Ward's (1963) linkage method (the most popular method in the social sciences; see Picón, Varela, and Real, 2005, p. 430). Then we used the iterative k-means clustering, which is considered more reliable than the conventional single-stage procedures (see Picón, Varela, and Real, 2005).

3.5. Methods and results

The study of consumer preferences was performed through Conjoint Analysis. These results are presented in Section 4.1. Market segmentation was performed through Cluster Analysis and analysis of variance (ANOVA), presented in Section 4.2.

Testing of Hypotheses 1, 2, and 3 was performed using the Mann-Whitney U test, whereas testing of Hypothesis 4 was performed using Fisher's Exact Test (due to sample size). Consequently, consumer price sensitivity is the dependent variable.

In Section 4.3.2., the authors used the Variation Attributed to the Change (based on the ideal product and the anti-ideal product obtained from Conjoint Analysis results) in order to estimate the gain or loss when changing levels of attributes. This methodology has been developed in recent years by USC-PSICOM (e.g., ACEMEU®). This methodology (see Rial, Dominique-Ferreira and Varela, 2011; Dominique-Ferreira, Rial

and Varela, 2012) consists in: i) first, "calculating the overall utility for all profiles from the most preferred option to the least preferred one; ii) next, "from the global utilities, it is necessary to estimate the gain or loss when changing a particular stimulus as a proportion of the Maximum Loss of Utility (MLU), that is, the difference between the overall utility of the ideal stimulus (the most preferred) and the anti-ideal (least preferred) one".

Finally, the traditional formula to estimate price elasticity of demand was used in Section 4.4.

4. RESULTS

4.1.Results of Conjoint Analysis

The model fit was very high, so we can conclude that validity of the results is high (Pearson's R=0.999; Kendall's Tau=0.983). The most important attribute was the price, with an importance of 77.901%. The second most relevant attribute was the bundled discount with an importance of 8.496%. Recommendation had an importance of 7.523%, and brand seemed to be the least important attribute of the four (6.081%).

Graph 1: Importance of attributes

Concerning the levels of the price attribute, the preferred one was, as expected, 150€ (u=4.448). However, we would like to note that paying 50€ more, i.e., 200€ (u=1.560) presents a positive part-worth. The levels 250€ and 300€ present negative part-worths (u=−1.377 and −4.631, respectively).

Bundled discounts are important for customers (u=0.495). Regarding the recommendation attribute, customers actually gave preference to products recommended by intermediaries (u=0.438).

Concerning the brand attribute, Açoreana seemed to be the preferred brand (u=0.340). Fidelidade-Mundial is the only other brand that presented a positive utility (u=0.143). Allianz and Tranquilidade had negative part-worths (−0.113 and −0.369, respectively).

4.2. Customer buying decision process

The results of a two-stage cluster analysis show the existence of four clusters regarding the customer buying decision process. The following tables (Tables 3 and 4) show the

initial and final centers of clusters. It seems that there are no important variations between both solutions.

Table 3: Final Cluster Centers

Table 4: Iteration history[5]

Nevertheless, clusters are clearly differentiated (see Table 5). Clusters 2 and 3 are the most different, mainly because of the importance given to price. Clusters 1 and 4 are the least different, mainly because they vary almost exclusively in bundling strategy.

Table 5: Distances between final cluster centers

Finally, in the following table it is possible to see the results of the ANOVA. Price is the attribute that most distinguishes clusters [F_{Price}=470.722, significance (Sig)=0.000].

Table 6: ANOVA

- Cluster 1 – 8.4% of the sample ("Guided by intermediaries and price") - These customers gave great importance to the recommendation of intermediaries (43.01%) and price (32.74%).
- Cluster 2 – 72.8% of the sample ("Shop around customers") - Customers who gave almost all the importance to price (74.93%).
- Cluster 3 – 10.6% of the sample ("Loyal to insurance companies") - These customers paid attention to the insurance company/brand (58.36%) and price (28.15%). They seem to be loyal customers.
- Cluster 4 – 8.2% of the sample ("Seek for advantages") - Finally, customers in Cluster 4 gave importance to bundling strategies (43.95%) and price (32.69%).

These results are interesting because they allow us to better understand how customers perceive insurers. Results show that 89.4% of customers support their buying decisions on price, intermediary recommendations, and other advantages. This is very important

[5] Convergence achieved due to no or small change in cluster centers. The maximum absolute coordinate change for any center is 0.000. The current iteration is 4. The minimum distance between initial centers is 59.351.

to insurers in terms of business negotiation strategies, e.g., because they highlight that intermediaries play a key role in selling.

4.3.Analysis of the hypotheses

4.3.1. Purchase involvement

Hypothesis 1: Customers with greater financial involvement with products are less price sensitive.

In order to make the analysis clearer, we decided to divide the sample into two groups:

- Group 1: Customers who pay more than the average price (higher involvement).
- Group 2: Customers who pay less than the average price (lower involvement).

Consumers who have a higher involvement give more importance to brand, less importance to price, and a little more importance to intermediary recommendation, and they are much more sensitive to price bundling (see Table 7). We can assume that these customers need to base the purchase decision on a larger number of elements in order to mitigate its associated risk.

Table 7: Part-worths based on financial involvement

Our data are not normally distributed (Shapiro-Wilk statistic=0.981; p=0.009 and 0.848; p<0.001, for low involvement and high involvement, respectively).

Table 8: Tests of Normality

Therefore, we performed the Mann-Whitney U Test (significance=0.006), indicating that the null hypothesis must be rejected. If we consider the price bundling attribute, the differences between customers with higher involvement and customers with lower involvement (significance=0.044) are statistically significant.

Therefore, hypothesis 1 (customers with greater financial involvement with products are less price sensitive) is accepted.

4.3.2. Customer loyalty

Hypothesis 2: Loyal customers are less price sensitive.

Hypothesis 3: Loyal customers are more sensitive to price bundling strategies than nonloyal customers.

Loyal customers give more importance to the brand (insurer) and less importance to price and intermediary recommendation. Also, loyal customers give much more importance to price bundling (Table 9).

Table 9: Attributes' importance of loyal vs. nonloyal customers

Table 10: Part-worth comparison between loyal and nonloyal customers

Table 11: Tests of Normality

A Mann-Whitney U Test was performed, and the output indicates that the null hypothesis must be retained (Sig=0.381). However, this result does not mean that there are no relevant differences between Groups 1 and 2 (see Table 10). Therefore, statistically, it is not possible to accept Hypothesis 2 (loyal customers are less price sensitive).

If we consider the price bundling attribute, there are significant differences between loyal and nonloyal customers (Sig=0.007). Loyal customers give much more importance to price bundling than nonloyal customers. Therefore, Hypothesis 3 (loyal customers are more sensitive to price bundling strategies than nonloyal customers) can be accepted.

Based on partial utilities, we estimated a gain or loss when changing a particular product. Therefore, we needed to estimate the global utility of the actual product (U_A) and the global utility of the simulated product (U_B), as well as the proportion of the Maximum Loss of Utility (MLU), that is, the difference between the global utility of the ideal product and the anti-ideal global utility. This index is called the Variation Attributed to Change (VAC), with a mathematical expression given by:

$$VAC = \frac{(UA - UB) \text{ x } 100}{MLU}$$

Simulations presented in Table 12 (only for loyal customers) show some examples of how it is possible to improve a product's preference through different situations. Specifically:

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- Example 1: If Açoreana maintains its price and intermediary recommendation and offers the bundled product, this would represent an increase of 9.63% in consumer preferences.
- Example 2: If Fidelidade-Mundial would like to get customers from Açoreana, this would be possible just by offering the bundled product.
- Example 3: If Açoreana matched Tranquilidade's simulated product and offered the bundled product, it would be possible to increase its product attractiveness by approximately 25%.
- Example 4: Açoreana could almost equal consumer preference for the same product even if it charged 50€ more just by offering the bundled product.

Table 12: Characteristics of the simulated products

We present examples of simulated products for illustrative purposes only. The most interesting aspect of these analyses is that insurers could make some prediction of how specific customers would react to new products based on different criteria (gender, age, consumption patterns, loyalty behaviors, purchase involvement, etc.).

4.3.3. Price bundling and price perception

Hypothesis 4: Partitioned prices have better acceptance than combined prices.

To analyze the best option to present price, we used a sample of 42 customers. Our results show that 61.9% would accept the bundle option. Regarding price perception analysis, our results show that a partitioned price strategy has a little more acceptance than a combined (or nonpartitioned) price: 52.4% and 47.6%, respectively. Because our n<50, we used the Shapiro-Wilk statistic, and the P value was significant (<0.001 on both), suggesting that our data are not distributed normally (see Table 13). As shown in Table 14 – using Fisher's Exact Test – we cannot reject the null hypothesis.

Statistically, Hypothesis 4 cannot be accepted. However, in terms of business strategy, these differences should not be ignored, as is clear from the results in the next section.

Table 13: Tests of Normality

Table 14: Fisher's exact test

4.4. The effect of price bundling on the demand function

In the second stage of the study, we analyzed the potential interest of a bundling strategy in the insurance sector. The 42 customers of the second sample were divided into two groups as follows:

1. Group 1 (n=24): we asked customers from this group how they would react to a bundling strategy presented by their actual insurer.
2. Group 2 (n=18): these customers were asked if they would accept a bundling strategy from another insurer.

The average price paid by these customers was €303[6]. The bundled strategy supposes an increase of €30 over the base price, i.e., 333€[7]. From the 24 customers in Group 1, 18 would finally accept the bundled offer. This represents 75% acceptance. In this case, price elasticity of demand[8] is 4.205, i.e., customers are sensitive to this price bundling. From the 18 customers of Group 2, eight (8) would accept the bundled offer, i.e., a 44.4% acceptance. In this case, price elasticity of demand is 4.644. In practical terms:

1. Market with the actual logic (without the price bundling): 303€×24[9]=7272€
2. If customers are offered a price bundling:
   a. Actual customers: 333€×18[10]=5994€
   b. Customers from other firms: 333€×8[11]=2664€
   c. And customers with previous conditions (without price bundling): 303€×6[12]=1818€

Under the new conditions (price bundling), this market has a maximum potential of €10476 (R_A 5994+R_B 2664+R_C 1818). Comparing the actual market with the new

[6] Actual price – P1
[7] Price under the conditions of price bundling – P2
[8] Traditional formula was used: $\frac{\%\ CQD}{\%\ CP}\%$
Where CQD is the percentage of change in quantity demanded and CP is the percentage of change in price
[9] Actual quantity – Q1
[10] Quantity accepting price bundling from one firm – Q2
[11] Quantity accepting price bundling from other firms - Incorporated in Q2
[12] Quantity only accepting product under actual conditions – Q3

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possible one (with price bundling), the loss is €4482 (10476-5994). Graphical representation offers a more intuitive understanding.

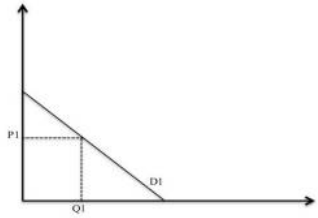

Illustration 1: DF under actual conditions

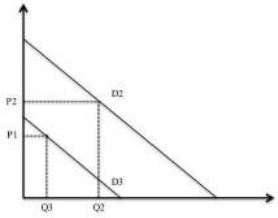

Illustration 2: DF under price bundling conditions

5. DISCUSSION AND CONCLUSIONS

Consumer price sensitivity has been a much-discussed subject because it has a direct impact on a firm's profits as well as on consumer satisfaction and loyalty behavior. Price sensitivity is affected by many elements, such as the perceived similarity between brands (Light, 1997; Iyer and Muncy, 2005), involvement with products, brand loyalty, and bundling strategies.

In this study, we only considered car insurance customers. And in this sector, it is not uncommon for Portuguese customers to forget the name of their insurer (brand). Therefore, we can say that there is a perceived similarity between brands, and this could explain why insurer brand is the less important attribute [Importance (IMP) =6.081%]. Further, intermediary recommendation is even more important for customers (Imp=7.523%), making marketing management even more difficult for insurers. In this sense, insurers should improve their support and partnership with intermediaries as mentioned by Hawksby (2015). This would benefit both – insurers and intermediaries – as a win-win solution, improving loyalty programs, e.g., through bundling strategies, which turns out to be the second most important attribute for customers (Imp=8.496%).

In this study we considered a price bundling strategy, specifically, a mixed-leader bundling (Guiltinan, 1987; Brito and Vasconcelos, 2015). Results show that 61.9% (approximately two out of three customers) of our sample would accept the bundle proposed, with the main product being auto insurance and home insurance being the product that would receive the reduction.

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On price presentation we did not find significant differences whether the price was partitioned or whether it was combined (acceptance percentage of 52.4% and 47.6%, respectively). Our results share some similarities with those obtained in other studies (Drumwright, 1992; Mazumbar and Jun, 1993; Morwitz *et al.*, 1998).

In the Portuguese insurance sector, bundling can be considered as a tool for price discrimination and as a cost-saving mechanism (see Sheikhzadeh and Elahi, 2013). Price discrimination because of this kind of bundling allows a reduction in the perceived price. It is a cost-saving mechanism because it may bring new customers and also because of the indirect impact that this practice has on loyal customers. Regarding bundling as a means of entry deterrence (Nalebuff, 2004 as cited in Sheikhzadeh and Elahi, 2013), we also think that this strategy may be consistent with the reality of the Portuguese insurance sector because in the last couple of months some international players were making an effort to enter the Portuguese insurance sector. The insurance industry is currently a difficult market, i.e., *higher insurance premiums; more stringent underwriting criteria, which means underwriting is more difficult; reduced capacity, which means insurance carriers write less insurance policies; and less competition among insurance carriers* (PSA Insurance and Financial Services, 2013). Therefore, in this context, bundling strategies could play an important role in product and service differentiation instead of traditional price discounts.

As far as price sensitivity is concerned, our results suggest that loyal customers give less importance to price when compared to nonloyal customers (Imp=75.829% and Imp=80.836%, respectively). However, we did not achieve significant statistical differences for this topic. Therefore, brands and intermediaries must be aware that, although loyal customers are "tolerant" to some price oscillation, they still give great importance to price. This may reinforce the idea that firms (insurers and intermediaries) may be more likely to be successful in increasing their revenues through bundling strategies than by simply increasing price. This result, together with the result of cluster analysis (Cluster 3 "loyal to insurers") and with the fact that the insurance sector has one of the highest turnover rates (Jacada, 2008; Deloitte, 2012; Soeini and Rodpysh, 2012), seems to indicate that more loyalty programs could be developed. In this context, the authors suggest an increase of contractual time for loyal customers. For example, instead of the standard 12-month contract, it could be interesting to develop long-term

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agreements with loyal customers of 3 years with some benefits, such as more coverage, freezing the price of auto insurance during the 3 years, increase cross-selling offers (e.g., auto insurance, home insurance, and health insurance). It could also be important to treat those customers as a cluster with differentiated services. For example, having an integrated advisory service based on a dedicated online Web service platform, an account manager (as in banking), and a specialized salesperson in order to convert a standard transactional sale to a customer relationship marketing, i.e., CRM (Sheth, 2002; Baron, Warnaby, and Hunter-Jones, 2014). Customer relationship profitability arises through the acquisition and retention of high-quality customers with low maintenance costs and high revenue (Anderson and Mittal, 2000). Therefore, distribution channels could play an important role knowing what strategies to apply to loyal customers (similar results were obtained by Li *et al*., 2012). These strategies could also be applied to customers who have a higher financial involvement because they give less importance to price and more importance to intermediary recommendation and they are much more sensitive to price bundling. Nevertheless, we suggest that insurers and intermediaries should preferably present first products with more coverage and services associated (e.g., online Web service platform, account manager) to prevent customers comparing products with low prices (in line with Gázquez-Abad and Sánchez-Pérez, 2009 work). Actually, "insurance companies face technological uncertainty that comes from how big data and analytics investments will drive revenue" (Dyer, Furr, and Lefrandt, 2014), so this online Web service platform could play an important role in customer relationship management. Cross-selling could also be a relevant strategy for these customers as a way of optimizing the wallet share of insurers and intermediaries.

Our sample in the experimental stage (the above-mentioned second stage) is relatively small. In future research it would be important to have a larger sample in order to take more general conclusions, minimizing a firm's risks before any commercial program. Or it would be interesting to make a first selective approach to market based on each customer's buying profile. Intermediaries could play an important role giving qualitative feedback on how customers react to bundling strategies and what could be other anchor products and complementary products. It would also be interesting to have the collaboration of an actuary in order to carry out more precise analysis of premium estimation of bundling strategies. In particular, it would be important to test different

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anchor products as well as different bundling combinations. It would also be interesting to study the ideal number of products that would compose the bundling strategy, for example, two anchor products and a price discount in the third product or different percentages of price discounts in the two associated products (e.g., home insurance and health insurance). Moreover, it could be relevant to consider life insurance products as part of a bundling strategy. It would also be interesting to study whether there is any benefit in applying the bundle discount to the anchor product instead of applying it to the accessory product. Finally, and depending on the characteristics of consumers in each country, it could be important to perform a stratified random sampling.

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Author Biographies:

Sérgio Dominique-Ferreira is doing a PhD program in Management and Marketing at the University of Porto, Adjunct Professor ate the Polytechnic Institute of Cavado and Ave. His research topics are marketing and management.

Helder Vasconcelos is : is a Professor of Economics of the University of Porto, Member Board of ANACOM (Regulator of the Communications Sector in Portugal), Research Associate of CEF.UP (Centre for Economics and Finance, University of Porto) and Research Affiliate of CEPR (Centre for Economic Policy Research, London). His

research topics are industrial organization, competition policy (antitrust policy) and regulation.

João Proença is the Rector of the Universidade Europeia – Laureate International Universities and Chief Academic Officer of the Laureate International Universities for Portugal, Researcher of the Advance, CSG-Research in Social Sciences and Management of the University of Lisbon, Professor of Management of the University of Porto. His research topics are marketing and management.

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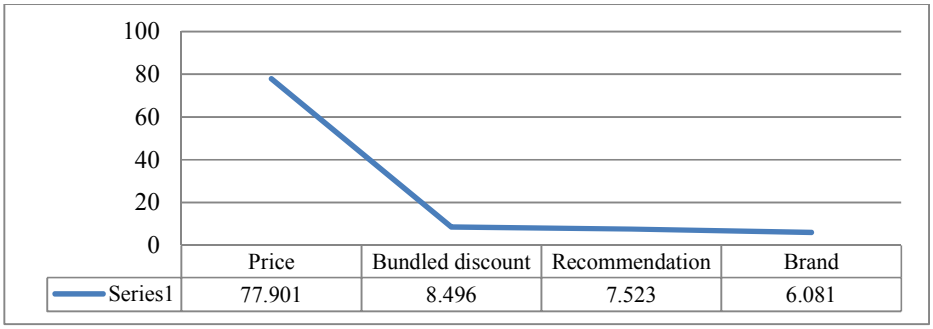

Graph 1: Importance of attributes

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Structure of distribution channels		
	Non life (%)	Life (%)
Intermediaries	89.7	95.3
Tied and captive agents	17.1	77
Brokers	17.6	1
Multi-brand intermediaries	54	17.3
Reinsurance	0	0
Of which: banks	16.1	76.7
Of which: postal	0	8.3
Direct Sell	9.8	4.5
Office	8.1	4.5
Internet	0.3	0
Phone	1.5	0
Others	0.5	0.2

Table 1: Structure of insurance distribution channels in 2013 (Portuguese Association of Insurance, 2014)

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Attribute	Levels
Recommended by intermediaries	• Yes • Opinion omitted
Price (Premium)[1][2]	• 150€ - Standard product through regulation (after the decree-law no. 72/2008, April 16th) • 200€ - the same coverage as the option of 150€ and vehicle occupants insurance • 250€ - the same coverage as the option of 200€ and auto glass insurance • 300€ - the same coverage as the option of 250€ and theft coverage
Brand (insurer)	• Brand A (Fidelidade-Mundial) • Brand B (Açoreana) • Brand C (Allianz) • Brand D (Tranquilidade)
Price bundling Home insurance with a promotional discount (for just 30€)	• Yes • No

Table 2: Attributes and corresponding levels

[1] Premium includes salesperson compensation (national standard) and standard claims handling costs
[2] No deductible (except for the theft coverage)

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	Cluster			
	1	**2**	**3**	**4**
Brand	14,80	11,70	**58,36**	14,83
Price	**32,64**	**74,93**	**28,15**	**32,69**
Intermediary's recommendation	**43,01**	5,81	8,05	8,53
Price bundling	9,54	7,55	5,45	**43,95**

Table 3: Final Cluster Centers

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Iteration	Change in Cluster Centers			
	1	2	3	4
1	4,584	,898	2,639	5,161
2	3,907	,476	,755	1,054
3	,892	0,000	1,523	1,088
4	0,000	0,000	0,000	0,000

Table 4: Iteration history[3]

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[3] Convergence achieved due to no or small change in cluster centres. The maximum absolute coordinate change for any centre is .000. The current iteration is 4. The minimum distance between initial centres is 59.351.

Cluster	1	2	3	4
1		56,443	56,186	48,716
2	56,443		66,143	55,920
3	56,186	**66,143**		58,292
4	**48,716**	55,920	58,292	

Table 5: Distances between final cluster centers

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	Cluster		Error			
	Mean Square	df	Mean Square	df	F	Sig.
Brand	24186,641	3	70,955	353	340,871	,000
Price	45825,056	3	97,350	353	470,722	,000
Intermediary's recommendation	12443,860	3	50,484	353	246,491	,000
Price bundling	11904,601	3	46,947	353	253,573	,000

Table 6: ANOVA

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	Group 1	Group 2
Brand	9,179	4,830
Price	69,698	82,110
Intermediary's recommendation	8,718	7,072
Price bundling	12,406	5,989

Table 7: Importance based on financial involvement

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	Kolmogorov-Smirnov (Lilliefors Significance Correction)			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Low involvement	,092	199	,000	,981	199	,009
High involvement	,134	103	,000	,848	103	,000

Table 8: Tests of Normality

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	Loyal	Nonloyal
Brand	7,833	5,645
Price	75,829	80,836
Intermediary's recommendation	6,704	11,289
Price bundling	9,634	2,230

Table 9: Attributes' importance of loyal vs. nonloyal customers

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		Loyal	Non-loyal
Brand	Açoreana	,468	,048
	Tranquilidade	-,458	,105
	Allianz	-,180	-,403
	Fidelidade-Mundial	,171	,250
Price	150	4,375	4,613
	200	1,550	1,661
	250	-1,341	-1,532
	300	-4,584	-4,742
Intermediary recommendation	Recommended	,396	,653
	Recommendation hidden	-,396	-,653
Price bundling	With bundled discount	,569	,129
	Without bunded discount	-,569	-,129
	Constant	8,500	8,500
	Ideal product	14,308	14,145
	Anti-ideal product	2,493	2,573

Table 10: Part-worths' comparison between loyal and nonloyal customers

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	Kolmogorov-Smirnov (Lilliefors Significance Correction)			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Nonloyal	,264	32	,000	,881	32	,002
Loyal	,222	201	,000	,839	201	,002

Table 11: Tests of Normality

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Brand	Price	Intermediary's recommendation	Price bundling	Global Utility	VAC
Açoreana	150€	Yes	No	13,169	Benchmark 1
Açoreana Example 1	150€	Yes	Yes	14.308	+9.63%
Fidelidade-Mundial Example 2	150€	Yes	Yes	14,011	+7.12%
Tranquilidade	200€	Hidden	No	8,627	Benchmark 2
Açoreana Example 3	200€	Yes	Yes	8,591	+24.17%
Açoreana Example 4	250€	Yes	Yes	8,591	-0.31%

Table 12: Characteristics of the simulated products

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		Kolmogorov-Smirnov[4]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Price bundling	Partitioned price	,383	22	,000	,628	22	,000
	Combined price	,413	20	,000	,608	20	,000

Table 13: Tests of Normality

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[4] Lillierfors Significance Correction

Chi-Square Tests					
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	,155[5]	1	,694		
Continuity Correction[6]	,006	1	,940		
Likelihood Ratio	,155	1	,693		
Fisher's Exact Test				,758	,470
Linear-by-Linear Association	,151	1	,697		
N of Valid Cases	42				

Table 14: Fisher's exact test

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[5] 0 cells (0,0%) have expected count less than 5. The minimum expected count is 7.62.
[6] Computed only for a 2x2 table