THE RELATIONSHIP BETWEEN INDIVIDUAL PRICE RESPONSE OF BEER CONSUMERS AND THEIR DEMOGRAPHIC/PSYCHOGRAPHIC CHARACTERISTICS

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1 Motivation

The knowledge of market behavior, especially, the knowledge of consumers’ responses to price (changes) is crucial for companies. The wrong prediction of price responses for a new product introduction or a product modification may result in extreme monetary losses, which may peril companies’ survival. The importance of this topic for both theoretical and practical purpose is well documented and several studies have broached consumers’ price responses. However, tiny focus was laid on variables, e.g., demographic or psychographic, that may affect the price reaction behavior of a consumer. Such factors, that influence the individual reaction on price changes, are important when the target audience exhibits a specific demographic or psychographic pattern. The evaluation of those factors will lead to a better understanding of the internal process on ”why” consumers react on price changes like they do.

2 Methods

To measure consumers’ reaction on price several tools, e.g., consumer survey, conjoint choice (CBC) analysis etc., are well established. (Breidert et al., 2006) While consumer surveys directly question respondents’ price limits, CBC analysis constitutes an indirect survey for measuring price responses. Several studies, which challenge both survey types, maintained the dominance of indirect approaches. (For a review of studies see Breidert et al., 2006.) However, conjoint choice methods are limited to some extend. Conjoint approaches link products to a specific utility, which is determined by product’s attributes. If price is considered as an attribute, one can estimate (part-worth) utilities for the considered price-levels. However, as pointed out by Breidert et al., 2006 ”By definition price does not have a utility, rather it reflects an
exchange rate between different utility scales.” (p. 15) Therefore, I will follow
the approach of Jedidi & Zhang, 2002 and focus on exchange rates for mea-
suring price responses. The exchange rate \((ER)\) of respondent \(i\) relates price
differences to utility differences and therefore displays the monetary value of
an utility unit.

\[
ER_i = \frac{p_1 - p_2}{\beta_{ip_1} - \beta_{ip_2}},
\]

where \(p_1\) and \(p_2\) denote price levels and \(\beta_{ip_1}\) and \(\beta_{ip_2}\) describe the associated
individual part-worth utilities of respondent \(i\). To achieve individual exchange
rates, one has to estimate individual part-worth utilities. This could be ac-
complished by using Hierarchical Bayesian (HB) techniques, which result in
CBC-HB-estimation. (A detailed description of CBC-HB-estimation is out of
scope of this contribution. The reader may be referred to articles of Andrews
et al., 2002 or Sawtooth Software Inc., 2009.)

Concerning the influence of psychographic variables on those individual ex-
change rates, I will focus on consumer’s personality as a specific aspect of psy-
chographic variables. To operationalized personality, the popular five-factor
model is used, which determines personality by five factors, i.e., extraversion,
neuroticism, conscientiousness, agreeableness and openness. (McCrae &
John, 1992) To measure how extravert etc. a respondent is, he/she self-reports
on rating scales within a personality test.

## 3 Application

To discover the relationship between individual price response and respon-
dent’s characteristics, the results of an empirical study were examined. The
empirical data set of 179 German respondents contains the results of a per-
sonality test (Saum-Aldehoff, 2012, pp. 189-198) and demographic questions
(gender, age, size of household) as well as the results of a conjoint choice ex-
periment. In the choice experiment the respondents were ask to choose their
preferred beer alternative out of 15 choice sets, respectively. Each beer alterna-
tive was explained by price per 0.5l (0.69€, 0.89€, 1.09€), alcohol level (0%,
4%, 8%), filling quantity (0.33l, 0.5l) and bottle color (neon-blue, transparent,
brown). Using CBC-HB estimation, individual part-worth utilities were esti-
mated. Furthermore, the results of the personality test were used to calculate
the levels of extraversion, neuroticism etc. The rating results for each factor
range between -20 and 20, where a high score for, e.g., extraversion signals a
high, e.g., extravert personality.

Due to problems in the calculation of exchange rates under consideration of
more than two price levels, I follow suggestions of marketing practitioners and focus on those two price levels, which seem most interesting. I decided to focus on the upper price levels, because of the inclusion of the 1€-threshold. On average, this trespass \((0.89 - to - 1.09€)\) results in higher utility losses in comparison to the \(0.69 - to - 0.89€\)-trespass. This leads to a more accurate/sensitive individual monetary utility value.

The calculation of individual exchange rates was conducted by formular (1). Subsequently, the respondents were clustered into high/low-groups for each personality factor, where the rating value “0” served as the distinctive criterion. Table 1 contains the respective group sizes as well as the F- and associated p-values resulting from one-way ANOVA. In this connection, the exchange rates served as dependent variables. Significant differences in exchange rates become obvious between the extraversion-groups \((p = 0.044)\), while no differences are displayed for the other personality factor-groups. The group of highly extravert respondents shows a higher exchange rate \((ER = 0.301)\) than the group of low extraverts \((ER = 0.169)\). This result could be further maintained by a positive, significant correlation \((r = 0.193, p = 0.010)\) between the individual exchange rates and extraversion values.

To examine connections between demographic consumer characteristics and exchange rates, one-way ANOVAs were conducted, too. While no significant differences in exchange rates \((F = 0.589, p = 0.623)\) become obvious between different age classes, gender differences exist \((F = 4.944, p = 0.027)\). Women \((n=79)\) yield higher exchange rates \((ER = 0.332)\) than men \((n = 100; ER = 0.192)\). As well, exchange rates differ significantly across different household-sizes \((F = 2.731; p = 0.045)\). Households with more than four members \((n = 7)\) yield significantly higher exchange rates \((ER = 0.569)\) than single-households \((n = 37; ER = 0.194; t = 2.498, p = 0.016)\) and 2-person-households \((n = 69; ER = 0.189; t = 1.788, p = 0.076)\). Furthermore, 3-or-

<table>
<thead>
<tr>
<th>Personality variables</th>
<th>low</th>
<th>high</th>
<th>F-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>extraversion</td>
<td>64</td>
<td>115</td>
<td>4.101</td>
<td>0.044</td>
</tr>
<tr>
<td>neuroticism</td>
<td>132</td>
<td>47</td>
<td>0.272</td>
<td>0.603</td>
</tr>
<tr>
<td>conscientiousness</td>
<td>15</td>
<td>164</td>
<td>0.084</td>
<td>0.772</td>
</tr>
<tr>
<td>agreeableness</td>
<td>13</td>
<td>166</td>
<td>0.024</td>
<td>0.877</td>
</tr>
<tr>
<td>openness</td>
<td>36</td>
<td>143</td>
<td>1.922</td>
<td>0.167</td>
</tr>
</tbody>
</table>
4-person-households \((n = 66)\) exhibit an exchange rate of 0.322 which differs significantly from that of 2-person-households \((t = 2.920, p = 0.005)\).

4 Conclusions

This contribution questioned the relationship between individual price response -measured by exchange rates - and beer consumers’ characteristics by using an empirical study. Cues were found, that demographic variables like gender and size of household as well as extraversion as a personality factor are linked to beer consumers’ price response behavior. Future research should extend this analysis to other product categories to examine generalizability.

References


