

# Price sensitivity testing as a basic tool for strategic pricing decisions

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## Abstract

**Background:** Data-driven decisions in each functional area of management, through all of the strategic levels, in the present time of dynamic changes in geopolitical and market conditions are necessary to achieve corporate (economic and social) goals, in line with securing future business success and sustainability. Because of this business need, we will focus in our research paper on price management, which can be seen as a supportive tool for strategic decisions, where competent decisions should be based on data-driven pricing decisions.

**Purpose:** The aim of the research study is to identify what price consumers are prepared to pay for a new food product in a relatively saturated foreign market. The research study was conducted in the milk chocolate bar market segment.

**Study design:** We applied the van Westendorp price sensitivity test to identify the range of acceptable prices for a product that is willing to enter a new foreign market. For this purpose, we used a milk chocolate bar product currently unknown in the Slovak market.

**Findings:** In addition to the van Westendorp price sensitivity measurement, we used a non-parametric Mann Whitney U test to confirm the hypothesis that chocolate tasting will increase the likelihood of customers to pay a higher price for the tested product. The hypothesis mentioned above was statistically confirmed.

**Limitations:** It is necessary to monitor customer reactions to a given price level and be prepared to optimize it. We did not address this part of the analysis in identifying a price that would be acceptable to consumers in terms of value perception, due to the scope of the study.

## Keywords

strategic decisions; pricing; price sensitivity; van Westendorp price sensitivity measurement; reference price

## Introduction

Chocolate production has a long history in Slovakia (the first factory was established in 1896). The turnover of the cocoa and chocolate manufacturing industry in Slovakia increased by 13 million euros in 2019, adding it up to the total turnover amount of 132 million euros in 2019

(Statista, 2019). Since 2017, we have seen a growing trend in the chocolate industry. Total consumption of chocolate and chocolate confectionery in Slovakia only in 2020 fell by an average of 900 grams (20.9%) per capita (Datacube, 2022). According to the final data of the Slovak Statistical Office, each Slovak ate 3.4 kg of chocolate confectionery, while the year before it

was 4.3 kg. The highest per capita consumption of chocolate was achieved in Slovakia in 2007, 2012 and 2014, when each citizen, regardless of age, consumed on average between 5.1 and 5.4 kg of chocolate or chocolate confectionery per year. Considering the rich history of chocolate and chocolate confectionery production in Slovakia and at the same time its popularity in consumption, which is also documented by the above short statistical overview, we decided to test the price sensitivity of chocolate consumers on a selected sample of respondents to acquire information about the acceptable consumer price for a 100 g pack of chocolate.

Setting the right price for the products is an application skill that every price and revenue manager should possess. According to the marketing researchers (Chhabra, 2014; Voros, 2019; Lipovetsky, Magnan & Zanetti-Polzi, 2011) the pricing decision is a substantial component of the marketing mix, and the price is the one that has a significant impact on customer loyalty and serves as a means of expressing quality (Makasi & Govender, 2014; Rao, 2005; Feenstra & Romalis, 2014).

The pricing process consists of activities such as obtaining and preparing price-relevant data, creating an institutionalized pricing process, pricing decision making, and the concept of systematic price adjustment, with the aim of creating an optimal price-setting process (Sato, 2019; Dutta, Zbaracki & Bergen, 2003). The determination of the specific price of a product must not only consider the costs of the business (Farm, 2020), but must also ensure its profitability (Balcioglu & Varol, 2022; Liozu & Hinterhuber, 2021). According to the pricing theory, four different approaches and their combinations can be applied in the pricing process – cost-based oriented, demand-oriented, competition-oriented, value-based oriented and their combinations (Smith, 2012; Schindler, Parsa & Naipaul, 2011; Bickhoff, Hollensen, & Opresnik, 2014). Although the most widely used approach is the cost-based pricing, it does not allow companies to achieve the top line revenue growth strategies (Mattos, Oyadomari & Zatta, 2021; Nejad, 2013; Krämer & Schmutz, 2020; Guerreiro & Amaral, 2018). Despite the fact that several authors have documented the existing positive relationship between value-based pricing and company performance (Liozu, 2017; Huefner, 2017; Provines, 2017), this pricing approach is scarcely used and is not widespread in corporate practice

(Steinbrenner & Turčínková, 2021). Value driven approach is based on defining and calculating the value customers' experience as a utility from a product (Jing & Lewis, 2011; Smith & Colgate, 2007). Utility is defined in microeconomic theory as the level of satisfaction a consumer gains from consuming a unit of a product (Besanko, Braeutigam & Gibbs, 2020). Depending on the volume of consumed units, utility increases, but the increments of utility, i.e., the consumer's satisfaction rates from the consumption realized, gradually decrease as consumption increases. This phenomenon is called diminishing marginal utility in micro-economic theory (Martin, 2019).

## 1. Literature review

The topic of consumer price sensitivity to a particular product category can be analysed from several perspectives. From a managerial perspective, we talk about the so-called price sensitivity, which is affected by many factors such as the level of purchase involvement, bundled discounts, and brand loyalty (Dominique-Ferreira, Vasconcelos & Proença, 2016; Arce-Urriza, & Cebollada, 2009; Pir & Derinozlu, 2020), age and gender (Valjaskova, Kral & Kliestikova, 2020), or consumer's local identity (Gao, Zhang & Mittal, 2017). Customer acceptance of bundled discounts has been strongly influenced by brand loyalty.

The price sensitivity of the consumer has always been a worldwide phenomenon addressed by marketing managers as well as researchers (van Westendorp, 1976; Slaba, 2021; Sathyanarayana & Heydt, 2013). This construct expresses the economic perception of a product value, perceived by customers, which can be considered as the fences of customer segments (Munnuka, 2005; Kim, Blattberg & Rossi, 1995; Sendegeya, Lugujo, Da Silva, Soderc & Amelin, 2009; Nicolau, 2009; Salamandic, Alijosiene & Gudonavičienė, 2014; Wakefield & Inman, 2003). It also affects consumer decision-making, from the perspective of the probability, what price they are willing to pay for a premium or innovative product (Zheng, Li, Fang & Zhang, 2021). The price sensitivity measurement has been a common approach to defining consumers' willingness-to-pay and assessing their knowledge about price (Salamandic et al., 2014; Danes & Lindsey-Mullikin, 2012). Nevertheless, it has faced criticism regarding its mathematical interpretation as well as its usefulness in brand management. From another point of view price sensitivity can be seen as a level at which and how consumer

behaviour can be influenced by the price of a product or service (Goldsmith & Newell, 1997; Mauricio, Deliza & Nassu, 2022).

The van Westendorp model as a frequently used tool for determining price sensitivity, provides estimates of the range of acceptable prices that potential buyers would be willing to pay by defining the upper and lower price level (Harmon, Unni & Anderson, 2007). It also refers to the difference between the point of marginal cheapness and the point of marginal expansion. This means how far a product's sales can be affected by price (Hartono, Salendu & Gatari, 2020).

According to the realised research, lower-income customers were more price-sensitive than higher-income ones (Hsieh & Chang, 2004). This would imply systematic differences in consumers' reactions to prices across formats and emphasizes the importance of a properly implemented price strategy and pricing in the company.

Equally important is the perception of customer preferences in terms of value, which is expressed through the customer's cognitive responses (Harmon et al., 2007). The buyer's tendency is to compare a product's value with that of a reference product. This cognitive process results in the recall of subconsciously stored information about the value called the reference price (Lastner, Fennell, Folse, Rice & Porter, 2019; Chandrashekar, 2011; Zhang & Chiang, 2020). This refers to a price that a consumer thinks of as an appropriate price for the product (Lewis & Shoemaker, 1997).

If the buyer perceives the price to be too high compared to the utility achieved, this results in a rapid decline in demand (Harmon et al., 2007).

The simple and low-cost applicability of the Van Westendorp price sensitivity model for food products has been demonstrated by several studies (Weinrich & Gassler, 2021; Ghali-Zinoubi & Toukabri, 2019; Anastasiou, Anastasiou, Keramitsoglou, Kalogeras, Tsagkaraki, Kalatzi & Tsagarakis 2017). Authors Stolz, Stolze, Hamm, Janssen and Ruto (2011) emphasized that organic food marketing should consider the price sensitivity of parts of occasional organic consumers and increase the perceived price-performance ratio of organic products communicating quality attributes. According to Scholz and Kulko (2022), freshness largely determines consumers' willingness to pay and price sensitivity. The use of the price sensitivity tool in price management brings for the pricing of a perishable product, which food products are, considerable positives.

## 2. Methods

The aim of our research study was to determine the price interval of a new food product (milk chocolate bar), which is not yet available on the Slovak market. By means of a price sensitivity test (van Westendorp price sensitivity test) we found out what price consumers would be willing to accept a new food product in our relatively new market segment of milk chocolate bars. For the purpose of the research study, we used a product unknown on the market in the country (Slovakia), coming from another country within a group of the countries of the European Union (Austria Hauswirth).

The price of the Hauswirth milk chocolate bar was compared with the following brands of milk chocolate bars – Lindt, Figaro, Ritter Sport, and with traditional Slovak milk chocolate Deva. Four competing products were visually presented to the respondents, with the intention of recalling the internal reference price, which is basically based on the past prices paid for the brand (Kumar, Hurley, Karande & Reinartz, 1998; Peschel, Zielke & Scholderer, 2022). In the following step, a group of respondents was asked to taste the chocolate, providing a framework for the external reference information (Nieto-García, Muñoz-Gallego & González-Benito, 2017; Zimri, Zamri & Aziz, 2012).

The original research sample (N = 372 respondents) consists of people (male N= 164; Female N= 208), aged 20 to 25. The respondents come from different regions of Slovakia (western, southern, central, northern, and eastern). The researchers ensured the objectivity of the measurement by using electronic data collection instruments to avoid influencing participants. The participants were briefed in writing by one researcher. Then, a statistical sample was randomly generated in the STATA software. We analysed consumer preferences at different price levels of a product using van Westendorp Price Sensitivity Meter (van Westendorp, 1976; Ceylana, Koseb & Aydin, 2014), which allows us to identify what price a consumer is willing to pay for a product. The above test is used to anticipate the expected value of a product and its usefulness to the consumer based on price perceptions of fairness and convenience of the purchase activity. The aim of the test was to identify the limit prices of the product that, on the one hand, motivate the consumer to undertake a purchase activity and, on the other hand, discourage him from undertaking a purchase activity.

The test itself consists of the following questions (Weinrich & Gassler, 2021):

- At what price would you consider the product so expensive that you would decide not to buy it? The product and service are too expensive;
- At what price would you start to doubt the quality of the product? The product and service are too cheap;
- At what price would you consider the product expensive but would still be willing to consider buying it? The product and service are expensive, it represents the upper limit of the price;
- At what price would you consider the product a bargain? The product and service are cheap, it represents the lower limit of the price (Stelick, Sogari, Rodolfi, Dando & Paciulli, 2021).

The result of the application of the van Westendorp price sensitivity test is a price interval ensuring that the price of the product or product innovation is set at a level acceptable to the consumer and thus achieving the desired sales volume and revenue. By applying the price sensitivity test, a company can identify the price levels listed below – point of marginal cheapness (PMC), point of marginal expensiveness (PME), optimal price point (OPP), indifference price point (IPP) and the range of acceptable prices (RAI) (Lewis & Shoemaker, 1997; Raab, Mayer, Kim, & Shoemaker, 2009).

*The point of marginal cheapness* reflects the price level at which the reduction in sales volume and revenue caused by the deterioration in the quality of the product and service is not offset by an increase in the sales volume of the product and service by consumers who consider this price level to be a bargain purchase.

*The point of marginal expensiveness* reflects the price level of a product and service that consumers consider to be unreasonable in relation to the perceived value or expected level of the cost of creating the product and providing the service.

*The optimal price* point expresses the price level for which the equilibrium consumer perception of the product as cheap and expensive at the same time holds. In this sense, a numerically equal group of consumers consider the product demanded to be too expensive and an equally numerically large group of consumers consider the price of the product to be too cheap.

*Indifference price point* reflects numerically equally sized groups of consumers who, on the one hand, think that the product is expensive and, on the other hand, consider the demanded product to be cheap. In terms of consumer perception, it is a purchase activity that matches the consumer's expectations in terms of value and that the consumer evaluates as relevant and successful. Empirical analysis has shown that the indifference price (IDP) (Çolak & Koşan, 2021), which presents either the median price paid by consumers, or the price of the product of a market leader, can vary for various sub-markets as price-conscious customers (people who buy cheap products and people who buy expensive products and brands). A general price anchoring point in a market exists and many people who buy more expensive brands or product types are fully conscious of doing so (van Westendorp, 1976).

The range of acceptable prices represents all prices that are acceptable to consumers (Harmon et al., 2007). Beyond its boundaries are the extremes where, on the one hand, consumers perceive a product to be so cheap that they would not buy it themselves, or, on the other hand, so expensive that they would not undertake purchasing activity anyway.

The indisputable advantage of this method is its simplicity, variability, and the possibility of linking it to other types of research tasks. On the other hand, the main disadvantage of the application of the test can be considered as the fact that it determines the price of each product in isolation, i.e., without interaction with competing products. For this reason, we extended the van Westendorp test to include another test criterion in the experiment, namely the gender of the respondents. At the same time, we set the testing in a situation where we provided respondents with frames of reference (Florack, Egger & Hübner, 2020; Teskey & Masson, 2017). The first frame of reference was competitive best-selling milk chocolates on the Slovak market, which were visually presented. Another parameter that influences customers' purchasing behaviour is the taste of the product, in this case the taste of Hauswirth milk chocolate bar (Szolnoki, Hoffmann & Herrmann, 2011). By tasting the tested chocolate, we established another frame of reference.

In the research process, measurement accuracy (objectivity) was ensured through electronic data collection tools to avoid influencing the research subject (Auerbach & Silverstein, 2003). Subsequently, the validity and reliability of the

questionnaire were tested (Jones et al., 2015; Kennedy, Kichler, Seabrook, Matthews & Dworatzek, 2019). The Cronbach's alpha was used to measure the internal consistency of the questionnaire's items among the respondents. The value  $\alpha = 0.71$  was obtained for a sample of 372 respondents. This value represents a marginal level of internal consistency (Leong & Austin, 2006).

**Table 1** Reliability of the price sensitivity test

Cronbach's Alpha	Number of items
.71	5

Source: the authors

Afterwards, we observed systematic differences among the responses of the participants, who tasted the milk chocolate and those who did not, in the variable Price. The following hypotheses were tested:

H1: Respondents who tasted the chocolate are willing to pay a statistically significant higher price for this chocolate than respondents who did not taste the chocolate.

H0: There is no statistically significant difference between the two groups (tasted or without tasting) in willingness to pay. A non-parametric test, the Mann-Whitney U test, was

applied to confirm the hypothesis that if the two groups have the same mean. To express the strength of the above-mentioned divergence we applied the statistical parameter effect size designed for the Mann Whitney U test, which can be calculated as follows (Mann & Whitney, 1947):

$$r = \frac{Z}{\sqrt{N}}$$

The acquired data were cleaned and statistically analysed using the STATA statistical software. Hypotheses were tested at a significance level of  $\alpha \leq 0.05$ .

### 3. Results and discussion

We decided to apply the van Westendorp price sensitivity test and demonstrate its importance and use in value-based pricing by setting a price of a new product line of milk chocolate bar, which is currently not available on the domestic (surveyed) market. The focus of the research experiment is to acquire information on the price sensitivity of customers for the product in a saturated market segment. Four price levels were observed in the research survey.

**Table 2** Descriptive table for price levels (in euro)

Variable	N	Mean	Std Dev	Variance	Kurtosis	Skewness	Min	Max	IQR	Median
tooExpensive	372	2.73	1.79	3.21	8.14	2.03	.70	10.00	1.5	2.245
tooCheap	372	.53	.266	.071	10.48	2.06	.00	2.00	.21	.50
Expensive	372	1.76	.99	.99	11.03	2.01	.50	9.00	1.08	1.50
Cheap	372	.95	.44	.19	6.08	1.59	.20	3.00	.34	.90

Source: the authors

Based on the descriptive statistical results we can say that the average price point of the milk chocolate bar Hauswirth perceived by respondents as "too Expensive" is  $M = 2.73$  (with variability  $SD = 1.79$ ). The minimum price the consumers are willing to pay in this price level is 0.70 euros; on the other side, the maximum price for milk chocolate will be stopped on the price level of 10.00 euros. The average "Expensive" price, which represents a realistic purchase, reached the value of  $M = 1.76$  euros ( $SD = .99$ ) and the price interval is in the range of  $Min = 0.50$  euros to  $Max = 9.00$  euros. The average price of the milk chocolate perceived as "Cheap" ( $M = .95$ ,  $SD = .44$ ) and "too Cheap" ( $M = .53$ ,  $SD = .266$ ) did not exceed 1 euro. Respondents who perceived the price of chocolate as "Cheap" and therefore a bargain would pay a maximum price of 3 euros. Ideally, it should be 20

cents. Respondents who perceived the price of the chocolate bar as suspiciously cheap ("too Cheap") to the extent that they distrusted its quality would pay a maximum of 2 euros.

The monitored statistical sample shows the highest positive value of the skewness in the variable price "too Cheap" (Skewness = 2.06), which provides the information on a larger representation of respondents with lower values of this price level. There are also more respondents with a lower value of perceived price level as "Cheap" (Skewness = 1.59). Then we can say that examined data represent a substantially skewed distribution. Based on the data about kurtosis, we found how the values of the variables are concentrated around the average. The price level "Cheap" shows the lowest positive value for the kurtosis coefficient ( $\gamma = 6.08$ ), which refers to the leptokurtic, what means

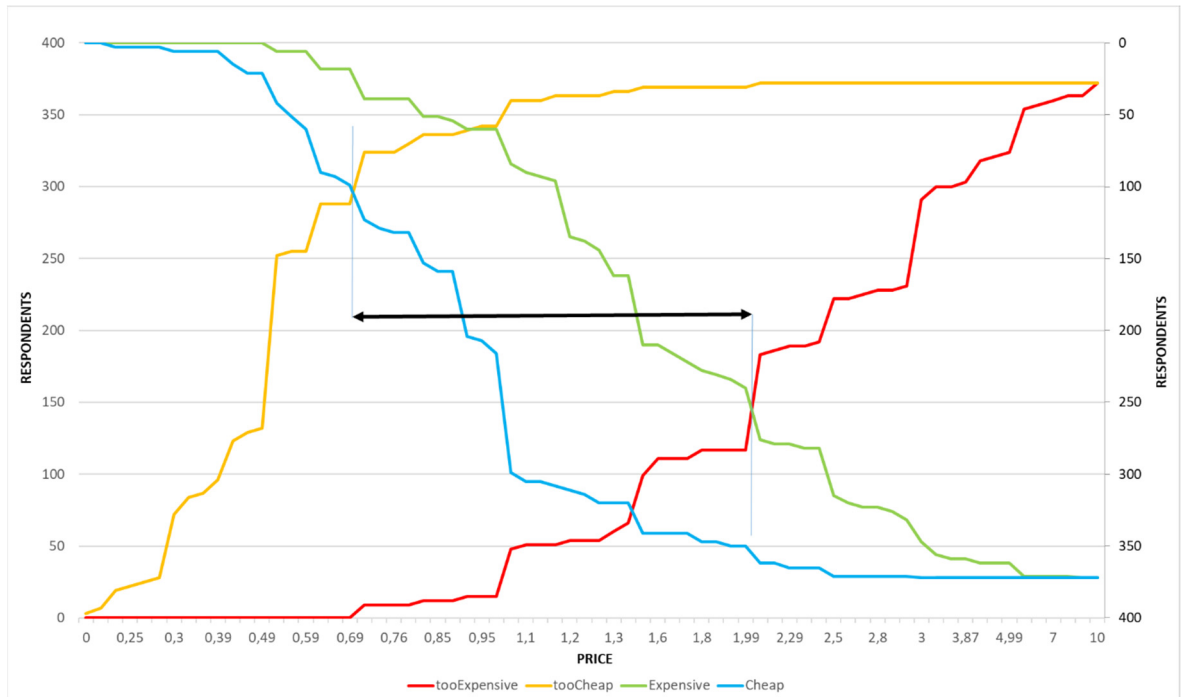
that there are more chances of outliers. In addition, the price level "Expensive" shows the same tendency ( $\gamma = 11.03$ ). Both price levels "too Cheap" ( $\gamma = 10.48$ ) and price level "too Expensive" ( $\gamma = 8.14$ ) are also positive, giving a clear concentration around the average, although with different variability.

The van Westendorp price sensitivity measurement was applied to identify the range of acceptable prices that would meet consumer expectations in terms of target orientation with respect to the quality of milk chocolate and is capable to determine the market price of the product in our market segment. Respondents were asked the following open-ended questions:

- At what price would you consider Hauswirth chocolate a bargain? (cheap)
- At what price would you consider Hauswirth chocolate so expensive that you would decide not to buy it? (too expensive)

- At what price would you start to doubt the quality of Hauswirth chocolate? (too cheap)
  - At what price would you consider Hauswirth chocolate expensive, but you would still be willing to consider buying it? (expensive)
- (Tarne, Lehmann & Kantner, 2019; Diamantopoulos, Matarazzo, Montanari & Petrychenko, 2021).

In the figure below, we present the results of the measured values from the survey, which allow us to identify and describe the consumer's perception of sensitivity to a change in the price of the product (Thomadsen, Rooderkerk & Amir, 2018). The range of acceptable prices represented by the four price levels is indicated graphically by the black line, the "tooCheap" and "Cheap" price curves at the intersections with the "Expensive" and "tooExpensive" curves form the boundaries of the interval of acceptable prices.



**Figure 1** The range of acceptable prices (in euro)  
 Source: the authors

The yellow curve in the figure above represents the price levels for which respondents considered Hauswirth milk chocolate bar so cheap that they would refuse to buy it because they doubted its quality. Potential customers would opt for an available competing product or might delay their purchase decisions because they would doubt the quality of the chocolate at a given price level. As can be seen from the figure above, all customers

consider the marginal price of Hauswirth milk chocolate bar to be 0.00 euros. This fact means that none of the respondents would be willing to consume Hauswirth chocolate bar even if it was offered free of charge. Of all the respondents, only 0.81% would still consider a price of 0.10 euros to be acceptable; all the others would no longer buy this type of milk chocolate bar for the reasons presented above. On the other hand, at a price

increase of 0.39 euros, about a quarter of all respondents, i.e. 25.81 %, answered that they would consider the tested type of chocolate bar so cheap that they would refuse to buy it. The cut-off price at which no consumer would consider Hauswirth milk chocolate bar to be inadequately cheap is 0.69 euros.

The blue curve represents the price levels for which consumers consider buying Hauswirth milk chocolate bar to be a bargain purchase. The consumer perceives the realisation of the purchase decision in the form of obtaining additional satisfaction. Satisfaction is formed by the positive expected differential value that the consumer perceives with respect to the price of the reference product. Thus, a positive disparity is created between the consumer's expectations and the reality of what he or she receives by buying Hauswirth milk chocolate bar for a particular price level. The consumer's perception of a positive differential value with respect to the product purchased creates the prerequisite for customer loyalty.

The analysis of the measured values presented in Figure 1 shows that all respondents perceive the price of Hauswirth milk chocolate bar at 0.00 euros to be cheap. Gradually as the price increases, for example at a price of 0.50 euros, approximately 88.71% of the respondents consider the product to be cheap, i.e. the price to be paid by the consumer for this product is still considered to be a bargain compared to the competing products available. On the other hand, for 1.50 euros for milk chocolate bar, only 8.33 % of the respondents consider this price level to be a bargain. Thus, a purchase that brings a positive differentiation effect to the consumer. The threshold price before identifying the positive differentiation effect obtained by buying Hauswirth milk chocolate bar is the price at 1.40 euros. At this price, 13.98 % of the respondents evaluate the purchase of chocolate bar as profitable, i.e. with a potential gain for the consumer. From a price of 1.40 euros, none of the consumers surveyed would rate the purchase of Hauswirth milk chocolate bar as a bargain purchase, i.e. a purchase with a positive impact on the consumer.

The green curve in the figure presented above indicates the price level for which respondents considered the price of Hauswirth milk chocolate bar to be expensive. The expression expensive does not depict a situation where consumers reject the product because of its high price but indicates that consumers perceive a negative differentiation

value. We interpret this fact to mean that the consumer considers the price he must pay with respect to the available competing products to be disproportionate compared to the effect he obtains by carrying out the purchase activity. We say that the consumer's expectations and assumptions did not meet with the reality given by the market and the price of the tested product on the market. The disparity between expectations and reality may be so strong that the company may not be successful in penetrating the market. The negative perception of inadequate and unfair pricing of the product by the customer may be so significant that he decides not to undertake purchasing activity, which will negatively affect the sales and the bottom line of the company in question.

The analysis of the measured values shows that all respondents consider the sale of Hauswirth milk chocolate bar for more than 8.00 euros to be expensive. On the other hand, if the tested chocolate bar sample cost less than 2.00 euros, all respondents of the implemented questionnaire survey would not consider it expensive. Based on the above, we assume that they would consider Hauswirth milk chocolate bar as cheap or too cheap. Gradually, as the price drops, for example at a price of 1.70 euros, approximately 40.32 % of the respondents surveyed do not consider the tested product to be expensive. These consumers perceive that the type of product mentioned corresponds to the price set by the market or the company offering the product. The group of consumers identified above consider this price to be reasonable in view of the satisfaction effect obtained. On the other hand, at a price of 2.50 euros for Hauswirth milk chocolate bar, only 15.32 % of the respondents consider this price level to be reasonable, 84.68 % of them consider the price to be unreasonable, i.e. expensive. Despite this fact consumers are considering buying the tested product. The threshold price before the identification of a negative differentiation effect is the price at the level of 2.00 euros. At this price, only about a quarter of the respondents, i.e. 25.81% of them evaluate such a purchase as reasonable. At a price exceeding 2.00 euros, none of the customers would probably be willing to pay and carry out the purchase activity of Hauswirth milk chocolate bar.

The last criterion evaluated was the price, which is unacceptable from the consumer's point of view for Hauswirth milk chocolate bar. In the figure above, these price levels are represented by the red curve. The price at which consumers consider Hauswirth milk chocolate bar to be

unreasonably expensive is 10.00 euros. At this price none of the respondents would be willing to pay the price for this product, so this price sales would reach zero (Peschel et al., 2022). This price level represents a prohibitive price of the demand.

Before gaining a deeper insight into the respondents' perception of the product, we introduced a frame of reference in the testing, which was a taste of the tested chocolate bar. The aim was to determine whether the taste of milk chocolate bar could be a good differentiator for higher or lower price sensitivity. The first group has tasted milk chocolate bar, the second did not.

Systematic differences among respondents were analysed through the non - parametric testing of the Mann Whitney U test. The selection of the applied test was conditional on meeting the conditions for the use of parametric tests. The variable on which the two groups were compared is an interval. Simultaneously, independence of measurement was ensured as described in the research design. The Kolmogorov-Smirnov test was used to test the data distribution normality.

**Table 3** Kolmogorov-Smirnov test for prices

		<i>tooExpensive</i>	<i>tooCheap</i>	<i>Expensive</i>	<i>Cheap</i>
<i>N</i>		372	372	372	372
<i>Most Extreme Differences</i>	<i>Absolute</i>	.25	.24	.27	.30
	<i>Positive</i>	.25	.24	.25	.30
	<i>Negative</i>	-.16	-.19	-.27	-.17
<i>Kolmogorov-Smirnov Z</i>		5.10	4.96	5.54	6.20
<i>Asymp. Sig. (2-tailed)</i>		.000	.000	.000	.000

Source: the authors

The significance level of the p-value for all interval parameters of price is lower than .05, meaning that the test is statistically significant and so the assumption of normally distributed data is disrupted (Remenova & Jankelova, 2019). As the p-values obtained from Levene's test is significant ( $p < 0.05$ ), we conclude that the data is not normally distributed. Therefore, Mann-Whitney U test is appropriate for analysing our two samples. The Shapiro-Wilk W test, based on the assumption of data normality, confirmed the same results (Cheap ( $W=.611$ ,  $p\text{-value} = .000$ ), Expensive ( $W=.37$ ,  $p\text{-value} = .000$ ), too Cheap ( $W=.50$ ,  $p\text{-value} = .000$ ), too Expensive ( $W=.76$ ,  $p\text{-value} = .000$ )).

The results of both tests indicated a violation of the conditions for parametric testing, so we used the non-parametric Mann Whitney U test to find out

the difference between the two groups of respondents. We were interested in whether respondents who tasted the milk chocolate bar are willing to pay a higher price for this chocolate than respondents who did not taste it. The following hypotheses were tested:

$H_1$ : Respondents who tasted the chocolate are willing to pay a statistically significant higher price for this chocolate than respondents who did not taste the chocolate.

$H_0$ : There is no statistically significant difference between the two groups (tasted or without tasting) in willingness to pay.

In the following tables, we present results for two groups. Group 1 represents those who had tested the chocolate bar. Group 2 consists of those respondents who did not taste chocolate bar.

**Table 4** Ranks and Test Statistics for Price "Cheap" by Taste of chocolate bar

Variable taste of chocolate bar	OBS	Rank sum	Adj. variance	Mean	Median	Z	p-value	Effect size
group 1 - yes	272	51688.5		.95	.9			
group 2 - no	100	17689.5		.95	.9			
total	372	69378	833349.43	.95	.9	1.05	.29	-

Source: the authors

On average, the respondents' group no. 2, which did not taste the chocolate would pay the same, "Cheap" price ( $M = .95$ ) for our product as

the group no. 1, - those who have tasted the chocolate bar ( $M = .95$ ). At the average price value "Cheap"  $M = .95$  the variation range showed a



value of 2.8 with the lowest value of 0.2 euros. Within the range of values in this price category, we were interested in the value of the interquartile range, which was  $IQR = .34$ . The quartile deviation and the coefficient of quartile deviation were also analysed to define the absolute and relative measures of dispersion ( $QD = .17$ ;  $CQD = .204$ ). We were also interested in the value of the Mode of each of the four price categories under study. Respondents in the "Cheap" category were most likely to pay 1 euro for milk chocolate bar (Mode = 1).

Despite the higher average price, the mean of group no. 1 is not statistically significantly higher than of group no. 2. Based on the results of non-parametric testing, we reject the alternative hypothesis and accept the null hypothesis because the respondents who have tasted the chocolate are not willing to pay a statistically significant higher price for this chocolate bar ( $p > .001$ ) than those who did not taste it.

**Table 5** Ranks and Test Statistics for Price "tooCheap" by Taste of chocolate bar

Variable taste of chocolate bar	Obs	Rank sum	Adj. variance	Mean	Median	Z	p value	Effect Size
group no. 1 - yes	272	52691		.55	.5			
group no. 2 - no	100	16687		.48	.5			
total	372	69378	813831.88	.53		2.176	.0296	.112

Source: the authors

As it turned out from the second price level analysis, the respondents' group no. 2, who did not taste the chocolate bar, would pay a lower price ( $M = .48$ ) in the price category "too Cheap" for our product than group no. 1 ( $M = .55$ ). Therefore, we can confirm that the mean of group no. 1 is statistically significantly higher than of group no. 2 ( $p$ -value = .0296). Based on the results of non-parametric testing, we reject the null hypothesis and accept the alternative hypothesis because the respondents who did not taste the chocolate bar are willing to pay a lower price for this chocolate bar than those who have tasted it. The strength of the difference has been calculated using the effect size (ES) formula, which determines the degree of association between the groups. According to Cohen (1988), our results of  $ES = .112$  reports weak association.

The variance margin of the price category 'too cheap' showed a value of 2 at zero lowest value, while the average price of milk chocolate in this category was  $M = .53$ . Within the range of values in this "too Cheap" price category, we were interested in the Interquartile range, which reached the level of  $IQR = .21$ . The quartile deviation and the coefficient of quartile deviation were also analysed to define the absolute and relative measures of dispersion ( $QD = .105$ ;  $CQD = .21$ ). We also looked at the amount paid for milk chocolate bar by respondents in the "tooCheap" category. Most often it was fifty cents (Mode = .50).

**Table 6** Ranks and Test Statistics for Price "Expensive" by Taste of chocolate bar

Variable taste of chocolate bar	Obs	Rank sum	Adj. variance	Mean	Median	Z	p value	Effect size
group no. 1 - yes	272	52534.5		1.81	1.5			
group no. 2 - no	100	16843.5		1.64	1.3			
total	372	69378	840675.35	1.76		1.970	.048	.102

Source: the authors

The price category labelled as "Expensive" had a higher mean value of 17 cents for respondents who have tasted chocolate bar ( $M = 1.81$ ). The mean for group no. 1 is statistically significantly

higher than for group no. 2. Therefore, based on the results of non-parametric testing, we reject the null hypothesis and accept the alternative hypothesis because there is statistically significant difference

between those two groups according to the price level.

At the mean value of the price "Expensive"  $M = 1.76$ , the variation margin showed a value of 8.5 at the lowest value of this price level, which is fifty cents. Because of the high variation margin, we calculated the Interquartile range, which for the "Expensive" price level was  $IQR = 1.108$ . The

Quartile Deviation and Coefficient of Quartile Deviation were also analysed in order to define the absolute and relative measure of dispersion ( $QD = .55$ ;  $CQD = .32$ ). For the price category "too Expensive", respondents reported that they most frequently would pay 1.5 euros for milk chocolate bar ( $Mode = 1.5$ )

**Table 7** Ranks and Test Statistics for Price "too Expensive" by Taste of chocolate bar

Variable taste of chocolate bar	Obs	Rank sum	Adj. variance	Mean	Median	Z	p value	Effect Size
group no. 1 - yes	272	53071		2.91	2.5			
group no. 2 - no	100	16307		2.2	2			
total	372	69378	834998.73	2.73	2.245	2.56	.01	.132

Source: the authors

Even for the price level marked "tooExpensive" respondents who have tasted chocolate bar would be willing to pay a higher price. Respondents without the option of tasting chocolate bar would on average pay 71 cents less for chocolate bar ( $M=2.2$ ) than those who have opportunity to taste the chocolate ( $M=2.91$ ). At the mean value of the "too Expensive" price level  $M = 2.73$ , the variance range showed a value of 9.3 at the lowest value of this price level  $Min = .70$  euros. Due to the high variation range, we have calculated the Interquartile range, at the price level "too Expensive" the  $IQR = 1.5$ . Quartile deviation and quartile deviation coefficient were also analysed to define absolute and relative measures of dispersion ( $QD = .75$ ;  $CQD = .33$ ). For the price category "too Expensive", respondents stated that the most frequently paid price for a milk chocolate bar was  $Mode = 2$  euros.

The mean for group no. 1 is statistically significantly higher than for group no. 2. Based on the results of non-parametric testing, we reject the null hypothesis and accept the alternative hypothesis because there is statistically significant difference between those two groups according to the price level ( $p = .01$ ).

## Conclusion

The objective of the research study was to highlight price levels and other factors that influence the consumer's purchase decisions. One such key factor is just the internal reference price of each respondent, which is based on the purchase already made in the past. An equally important factor is the perception of the taste of the product. We have incorporated the key frames of reference into the

study to gain deeper insights into the reasons for consumer decision making for a particular food product. At the same time, we highlighted the economic benefits of the frames of reference when testing the van Westendorp model. As the results of the analytical part of the study show, using the above price sensitivity test, we have identified a range of acceptable prices for a new food product based on customer perceived value. The price curves shown in Figure 1 "tooCheap" and "Cheap" at the intersections with the "Expensive" and "tooExpensive" curves form the boundaries of the range of acceptable prices.

The lower boundary price of the interval is the price that is the intersection of the "tooCheap" and "Cheap" curves. On the other hand, the marginal price of the upper part of the interval is the price that is the intersection of the "tooExpensive" and "Expensive" curves. At this price, consumers are not willing to accept a higher price. The price levels between these two marginal prices are evaluated by consumers as acceptable. For Hauswirth's new product milk chocolate bar, this range of acceptable prices is  $<0.69; 2.00>$  euros. The optimal price level is 0.99 euros.

The median value of each price level divided our respondents into equally sized groups. For the Price "tooCheap" category, half of the respondents would pay more than fifty cents; for the Price "Cheap" category, they would pay up to .90 euros. For the price category "Expensive", half of the respondents would not pay more than 1.50 euros for a Hauswirth milk chocolate bar. Within the last price level "tooExpensive", the category median was 2.245 euros.

As part of the study, we also investigated the effect of the frame of reference on respondents'

willingness to pay a higher price for the product if there will be opportunity to taste the product (chocolate bar). Chocolate taste possibility was applied as the reference frame. Respondents from the test group no. 1 were offered chocolate directly during testing. A bar of chocolate was opened directly in front of them so that they could smell and taste it. Through a non-parametric Mann Whitney U test of the difference in means of the 2 groups, we investigated whether the group that tasted the chocolate would pay a higher price than the group that did not taste it. The hypothesis was confirmed.

### Managerial implication

From the managerial point of view, it is important to know which factors influence consumer behavior and to what extent. As presented and confirmed in this study, the key roles are played by customers' internal reference prices and the possibility to taste the product (milk chocolate bar). Outcomes of our research confirm that the use of analytical tools for the analysis of consumer behavior gives the company's management foundations for setting an appropriate pricing strategy that ensures higher revenues and profit. It also provides an answer to strategic questions about the appropriate level of price range a product entering an almost saturated foreign market.

### Limitation of the study

To determine the price of milk chocolate bar, we applied a value-based pricing approach using the van Westendorp test, which provides an economic expression of the perceived value of the product to the consumer (Johansson & Andersson, 2012). The indisputable advantage of this method is its simplicity, variability, and the possibility of linking it to other types of research tasks. On the other hand, the main disadvantage of applying the test is that it determines the price of each product in isolation, i.e., without interaction towards competing products.

However, for the optimal pricing decision of the company, it is also necessary to consider the cost level of the price to ensure the desired profitability of the product. In defining the optimal price, it is important to express in relation to what the optimal price is pursued, what objective is desired to be met by the pricing decision.

It is also important to stress that the price sensitivity testing method used is one of the methods within the framework of the basic product

pricing approaches. Consequently, it is necessary to monitor customer reactions to a given price level and be prepared to optimize it. We did not address this part of the analysis in identifying a price that would be acceptable to consumers in terms of value perception due to the scope of the study. In conducting the research study, we focused solely on tracking the price of a product entering a saturated market segment. The prices of competing chocolates were not included in the study as the primary VW test does not allow for such an application. Since the topic of pricing is an extensive area of microeconomics, we see space for future research opportunities. Especially, in linking the ability to test price in relation to the company's intrinsic financial parameters regarding competing products that potential customers consider in the product purchase decision process and the amount of the benchmark value of the product being tested.

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### Authorship

K. R. and M. K. B. designed the study and acquired the data. K. R. and J. K. provided data cleaning and analysis of the data. The draft was prepared by K. R. and M. K. B.. K. R. was responsible for revising the manuscript for important intellectual content. All authors have read and approved the final version of the manuscript.

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