

INDUSTRY-SPECIFIC FACTORS IMPEDING THE IMPLEMENTATION OF VALUE-BASED PRICING

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ABSTRACT

Value-based pricing (VBP) is often considered the most profitable pricing method. However, VBP is rarely implemented by companies. This research study asks the question Why? and investigates the obstacles to an implementation of VBP. The objectives of this paper are to provide an assessment of customer-based obstacles to implement VBP in four different German industries and to evaluate the degree of company-based obstacles by industry. For that purpose, 792 consumer questionnaires were collected and 20 expert interviews were conducted.

The results show that the technology industry is the German industry with the lowest obstacles, while the pharmaceutical industry experiences the strongest obstacles. The degree of obstacles varies significantly by industry.

This study contributes to theory by taking both a customer perspective and a business perspective towards VBP while identifying the degree of the obstacles to implement VBP by industry. This paper allows future researchers and business practitioners to assess the industry-specific obstacles and take appropriate measures to overcome them.

KEY WORDS

value, pricing, implementation, obstacles, strategy

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1 INTRODUCTION AND OBJECTIVE

Across the globe, there exists universal agreement that pricing is one of the most powerful revenue-generating strategies, but it is still underestimated in many cases (Baker et al.,

2010; Bruck, 2010). According to Simon and Fassnacht (2016), three main profit drivers exist, namely price, quantity, and costs. Price management is often referred to as a value-

and revenue-maximizing tool (Jommi et al., 2020). Overall, today's literature has shown a strong interest in the marketing mix and its implications for companies. Out of the factors of the marketing mix – product, price, place, promotion and people – the factor price has received the least research so far, despite the outstanding significance and impact it has on overall returns. Research has rather focused on the factors product, place, promotion, and people than on the factor price (Harvey, 1993; Harris, 1994; Rosenbloom et al., 1997; Baker et al., 2010; Bruck, 2010; Reynolds, 2018).

This seems an astonishing fact, as prices are the ubiquitous factor with practical interest by each company and each service-providing organization. In today's quickly changing market environments, adapting to new circumstances is crucial. Pricing power – being defined by Tacke et al. (2012, p. 2) as “the ability of a company to get the prices it deserves for the value it delivers to customers” is needed by companies to be able to respond to these changes. Within the approach of price determination, several different methods may be elaborated upon. The emerging pricing method value-based pricing has increasingly attracted researchers' attention in recent years (e.g. Hinterhuber, 2008a; Anderson et al., 2010; Hinterhuber and Bertini, 2011; Nagle et al., 2011; Hinterhuber and Liozu, 2012; Michel and Pfäffli, 2012; Töytäri et al., 2015; Töytäri et al., 2017; Nagle and

Müller, 2018; Reynolds, 2018). Particularly, the striking aspect of a low implementation rate of VBP among companies surfaced (e.g. Codini et al., 2012; Michel and Pfäffli, 2012; Töytäri et al., 2017). While literature has already explained some obstacles to its implementation, a cross-industry analysis of the barriers and an assessment of their weight was lacking. This was confirmed by Töytäri et al.'s (2017, p. 245) findings, who encouraged that “research could investigate several [...] industries” in the investigation of VBP obstacles.

Thus, the objective of this paper was to derive an evaluation of the industry-specific obstacles to implement VBP from both customer data and company data. First, a customer-based evaluation of the main obstacles to the implementation of VBP was conducted to identify the industries with the strongest and weakest barriers to implement VBP. Second, a company-based evaluation of existing barriers to implement VBP should lead to a detailed assessment of the degree of these barriers by industry and define whether they differ significantly or are rather similar. Therefore, two research questions were used for this research study which are stated as the following:

RQ₁: In which German industry are the customer-based obstacles to the implementation of value-based pricing the largest?

RQ₂: Are there significant differences between the obstacles in the industries analyzed?

2 LITERATURE REVIEW

2.1 Traditional Pricing Methods

Cost-based pricing is a pricing method where a desired profit amount or margin is added to direct and indirect costs of a product or service (Noble and Gruca, 1999; Shipley and Jobber, 2001). This method is also referred to as cost-plus pricing, mark-up pricing or target-profit pricing (Cannon and Morgan, 1990). Cost-based pricing reaps the benefits of reduced complexity in price determination as well as readily available information (Harmon et al., 2009). However, researchers Noble and

Gruca (1999) and Dutta et al. (2002) suggest that a customer-centric price determination method can be recommended in today's business environment. Cost-based pricing is rather company-driven, with a lack of customer value reflection (Guerreiro and Amaral, 2018, p. 394). Frohmann (2018, p. 75) further stated that if the expected profit margin based on overall costs is unreasonably high, market share and volume are lost to competitors.

A second and very widely used pricing method is competition-based pricing, where prices are determined by competitors' prices

on the market (Simon and Dolan, 1997; Roll et al., 2012; Simon and Fassnacht, 2008, 2016; Frohmann, 2018). According to Hinterhuber (2008a), competition-based pricing is the most relevant pricing method in B2C markets, mainly because the approach ensures the ability to constantly adapt prices based on average market prices. With increasingly transparent players on the market, observing and monitoring competitors' prices is strongly facilitated (Frohmann, 2018, p. 77). However, competition-based pricing can lead to dangerous spiral effects if one competitor starts with a price reduction. With suppliers underbidding themselves constantly, the whole industry may be led into lengthy price wars with reduced sales volumes for all market participants, often referred to as Game Theory in literature (Simon and Fassnacht, 2016; Frohmann, 2018; Dixit and Nalebuff, 2019).

2.2 Value-Based Pricing

Cannon and Morgan (1990, p. 22) defined value-based pricing or perceived-value pricing as an "approach (that) involves pricing on the basis of the monetary value a product has for target customers. It is a demand-oriented method which assumes that a firm can determine what people are willing to pay for a product and its various forms". Ding (2007, p. 386) explained the concept of it: "Value-based pricing is an important conceptual approach [...] that leverages the benefits of the service offering in order to match the buyer's willingness-to-pay with the value received". Garrison and Towse (2017, p. 2) stated that "the value of a good or service to an individual is what that individual would be willing to pay for it in monetary terms or give up in terms of other resources or time to receive it. [...] in market transactions, there may be a difference between what the individual would be willing to pay and the market price they face: that difference (if price is lower) is called the 'consumer surplus'". Garner et al. (2017, p. 5) mentioned that "VBP is a well-established pricing strategy for commodities. The basic idea behind this approach is that the price of goods

should reflect the value to the buyer rather than the actual costs of production plus a margin."

Over the last decades, research interest has been growing in this new pricing method. Slywotzky (1996) explained this growing attention with the belief that value-based pricing could lead to more successful pricing outcomes. Garrison and Towse (2017, p. 1) confirmed this finding by explaining that value-based outcomes and pricing "are high on the list of buzzwords". According to several researchers, this growing interest roots in the fact that VBP reaps the strongest benefits within pricing methods (e.g. Drummond and Towse, 2019). Blois and Ramírez (2006) and Gosselin and Bauwen (2006) mentioned that creating customer value is strongly connected to the achievement of strong business performance. This was confirmed by more recent research: Nagle and Müller (2018) stated that the customer perceived value should always be reflected in the pricing process of products or services.

Further, Eggert et al. (2006) explained that long-term success and survival are consequences to the creation of customer value. According to Anderson et al. (2010), value-based pricing is both favorable to the buyer and the supplier, creating a positive sum-game (Terho et al., 2012). A multitude of researchers further agreed that value-based pricing is the most profitable pricing method in today's business environment (e.g. Hünenberg and Hüttmann, 2003; Piercy et al., 2010). Moreover, value-based pricing is positively correlated with the success of new products, while there is no such positive correlation between the success of new products and cost- or competition-based pricing (Ingenbleek et al., 2003).

Additionally, "VBP helps to maximize value within the available budget" (Jommi et al., 2020, p. 15). Furthermore, it is likely that a higher customer perceived value and higher effectiveness with VBP can be achieved through digital marketing efforts (Reynolds, 2018). Another advantage of VBP is that the "VBP price would grant all the consumer surplus to the producer, which in theory provides optimal incentives for investment in R&D at the margin.

High expected returns may encourage multiple competitors of slightly differentiated products” (Danzon, 2018, p. 253).

As value-based pricing usually comes along with higher prices than cost- or competition-based pricing (Hinterhuber, 2008a), higher revenues often are the result. Therefore, it can be stated that the more a consumer is price-sensitive, the lower the chances for successful implementation of VBP. Drummond and Towse (2019, p. 945) concluded that “Value-based pricing (VBP) is considered by many to be far superior to most of the alternatives, such as uninformed price negotiations, or internal or external reference pricing. However, there are issues in the application of VBP, with differences of opinion about what constitutes ‘value’ and about the determination of the ‘cost-effectiveness threshold’ against which value is to be judged.”

2.3 Implementing VBP

When it comes to the implementation or usage of these pricing methods, several interesting results were found. In a study conducted by Horngren and Foster (1991), the researchers found that in the United States, a cost-based pricing approach was used by 46% of companies. Hinterhuber and Bertini (2011, p. 47) found that in a summary of all published research from 1983 to 2006 in business practice, 44% of companies employed a competition-based approach, while 37% used a cost-based approach. Only 17% of companies utilized customer value-oriented approaches such as value-based pricing. Thus, if academic theory suggests and researchers agree on the fact that value-based pricing is the most profitable, recommendable, and game-changing pricing practice, why have not more companies across industries implemented value-based pricing? What are the factors preventing it?

Researchers have already found some obstacles to the implementation of VBP (e.g. Hinterhuber, 2008a; Hinterhuber and Bertini, 2011; Nagle et al., 2011; Hinterhuber and Liozu, 2012; Michel and Pfäffli, 2012; Töytäri et al., 2015; Töytäri et al., 2017; Nagle and Müller,

2018; Reynolds, 2018). According to Forbis and Mehta (1981), VBP is a highly sophisticated pricing approach but complicated because of a high customer specificity. Several researchers stated that a value-based pricing approach is by far a more complex way to price products or services in comparison to other pricing methods (Nenonen and Storbacka, 2010; Liozu et al., 2012a; Töytäri et al., 2017).

Hinterhuber (2008a) and Hinterhuber and Bertini (2011) identified the main barriers in implementing VBP as the difficulties in assessing value, communicating value, market segmentation, sales force management and senior management support. Hinterhuber and Bertini (2011, p. 47) stated that “companies are frequently forced to revert to cost-based or competition-based pricing, simply because they do not have the tools to measure customer value reliably. In fact, it is not uncommon for marketing and sales teams to be uncertain of what value actually is. [...] Companies successful at implementing value-based pricing generally employ a series of rigorous empirical tools to reliably measure (and continuously track) customer value.” In another study, Nagle and Hogan (2007) mentioned two organizational barriers when implementing a different pricing method other than the one already established. These were the lack of willingness to accept changes in pricing decisions as well as the compensation dilemma among salespeople, where salesforce is often compensated by quantity sold or by volume, encouraging them to sell on low price, high quantity.

In a more recent study conducted by Töytäri et al. (2017), representatives from industrial markets and the technology industry were asked to define the barriers to the implementation of value-based pricing. The outcomes of their study were threefold: First, individually induced barriers such as the complexity of value quantification and the lack of experience or skills could be identified. Second, organizationally induced barriers such as the product-oriented sales culture and the lack of governance or tools were existent. Third, externally induced barriers such as a prevailing buying culture and incompatible time horizons were additional

factors impeding the implementation of VBP (Töytäri et al., 2017). Based on an extensive literature review by the authors, the fourteen most frequently known obstacles to implement VBP were the following:

- Customer's feeling of injustice (Michel and Pfäffli, 2012)
- Danger of customer loss (Dittmer, 2017)
- Different value perception of buyer and seller (Töytäri et al., 2017)
- Difficult market segmentation (Hinterhuber, 2008a; Hinterhuber and Bertini, 2011; Michel and Pfäffli, 2012; Töytäri et al., 2017)
- Difficulties in assessing the customer perceived value (Ramírez, 1999; Flint et al., 2002; Vargo and Lusch, 2004; Lindgreen and Wynstra, 2005; Kowalkowski, 2011; Dittmer, 2017)
- Difficulty in communicating the value of the product to the customer (Hinterhuber, 2008a; Hinterhuber and Bertini, 2011; Michel and Pfäffli, 2012)
- Habit of using traditional pricing methods (Hinterhuber, 2008a; Hinterhuber, 2008b; Indounas, 2009; Kurz and Többens, 2012; Liozu et al., 2012b; Töytäri et al., 2015; Liozu, 2017; Kienzler, 2018)
- High costs and complexity (Nenonen and Storbacka, 2010; Codini et al., 2012; Liozu et al., 2012a; Michel and Pfäffli, 2012; Töytäri et al., 2017)
- Lack of availability of suitable tools (Dutta et al., 2003; Tohamy and Keltz, 2008; Provines, 2010)
- Lack of experience and skills (Töytäri et al., 2017)
- Lack of motivation of the respective department (Nagle and Hogan, 2007; Töytäri et al., 2015; Töytäri et al., 2017)
- Lack of support from top management (Tohamy and Keltz, 2008; Hinterhuber, 2008a; Hinterhuber and Bertini, 2011; Liozu et al., 2012b; Liinamaa et al., 2016)
- Missing data (Töytäri et al., 2015; Kienzler, 2018)
- Product-oriented sales culture (Hinterhuber, 2008a; Hinterhuber and Bertini, 2011; Töytäri et al., 2017)

In the pharmaceutical industry, additional obstacles may even be added for consideration. In pharmacy, VBP epitomizes a “method of drug pricing in which the drug cost is based on the magnitude of benefit it provides to those who use it, and perhaps to society as a whole” (Shaker and Greenhawt, 2018, p. 2). As Garrison et al. (2019, p. 794) emphasized, the value can hardly be judged in therapeutics and treatments: “If a therapy ‘cures’ a disease that would be fatal in early childhood, an additional question emerges about the value of a full life.” This was confirmed by Drummond and Towse’s (2019, p. 945) research, who stated that VBP is inappropriate “in the pricing of treatments for ultra-rare diseases”. Garner et al. (2017, p. 5) confirmed this by stating that “in the context of pharmaceuticals there is no widely accepted definition of VBP.” Further, “VBP for pharmaceuticals has been for years considered superior compared with cost-plus methods of price determination” mainly because “it exhibits heterogeneous understanding” (Jommi et al., 2020, p. 15).

In a more recent investigation on newer obstacles to the implementation of VBP, four additional obstacles were found. These new obstacles are the non-holistic pricing approach, the fear to lose customers, the lack of value recognition and the inconsistency in execution (Steinbrenner, 2020).

2.4 Research Gaps

The main research gaps this study addressed were the lack of cross-industry focus of the impediments on VBP. Most of the currently available research was focused on the obstacles themselves without any scale or degree of their impact by industry. It would be interesting to identify the degree how strongly the barriers truly prevent or impede an implementation of VBP. Further, no available study has yet focused on the evaluation of an implementation of value-based pricing in German companies in particular. The German economy is of high relevance in Europe and an in-depth analysis of the German market with its industries may be needed. In addition, no available study has

yet focused on the consumer perspective and the business perspective of an implementation of value-based pricing simultaneously. Furthermore, very recent studies about the obstacles to implement VBP lack in literature. Most studies identifying the obstacles to implement VBP were published before 2017, making an updated

assessment highly necessary. This study addressed these research gaps by providing a holistic approach to identify and scale the industry-specific obstacles to an implementation of value-based pricing both from a customer-based and a company-based perspective.

3 METHODS AND MATERIAL

3.1 Methodology

As a methodological choice to this study, a mixed-methods research design has been used. On the one hand, a mono method quantitative design was taken by using a quantitative online questionnaire as a consumer study. On the other hand, by using a qualitative data collection method in conducting expert interviews, rather a mono method qualitative design was utilized, leading to a mixed-methods research design based on the definition of Saunders and Tosey (2013). The time horizon of this research study utilized both a cross-sectional as well as a longitudinal research approach.

3.2 Hypotheses

The hypotheses used for this research study and their connected research questions are stated below.

RQ₁: In which German industry are the customer-based obstacles to the implementation of value-based pricing the largest?

- H₀: The customer-based obstacles to an implementation of value-based pricing in the technology industry are higher than or the same as in other analyzed industries.
- H₁: The customer-based obstacles to an implementation of value-based pricing in the technology industry are lower than in other analyzed industries.

Research question RQ₁ will be responded to by using van Westendorp's Price Sensitivity Meter (van Westendorp, 1976).

RQ₂: Are there significant differences between the obstacles in the industries analyzed?

- H₀: There is no significant difference in the distributions of the obstacles between the industries analyzed.
- H₁: There is a significant difference in the distributions of the obstacles between the industries analyzed.

Research question RQ₂ will be responded to by using the statistical Kruskal-Wallis H test.

3.3 Industry Focus

The objectives of this study were to provide an evaluation of customer-based barriers to implement VBP as well as to derive an assessment of the degree or weight of the specific barriers by industry. Thus, four industries needed to be investigated in which barriers have already been identified by researchers. Therefore, the four industries investigated in this research paper were the technology industry, the travel & tourism industry, the retail and consumer goods industry and the pharmaceutical industry in Germany.

For each of these industries, one representative product was chosen. The prerequisite for this product was that each survey participant had already, at least once, purchased this product in the past. Therefore, specific products were chosen to increase the likelihood that all survey respondents were able to provide a response to the associated questions in the survey. For the technology industry, the smartphone was selected as the product with a very high likelihood that survey participants that use the online survey of this study were familiar with a device like a smartphone.

For the travel & tourism industry, the rental car was chosen. The idea was, again, to achieve a very high likelihood for previous experiences with the product among survey participants. For the retail industry, the winter coat was chosen for the German market, as it was very likely that every German citizen older than 18 years had purchased one in the past. Further, for the pharmaceutical industry, a basic representative product was used with the headache-relieving pills where, in our belief, the likelihood was the highest that each participant had bought some before.

The industry focus was chosen to be broad intentionally. This was done in order to be able to derive generalizable results and compare the obstacles in four completely unrelated industries and to see whether there are differences. A summary of the chosen German industries with previous research on the obstacles to implement VBP along with the representative product selected for this study is found below.

1. Technology industry (Töytäri et al., 2015; Liinamaa et al., 2016; Kienzler, 2018). Representative product in this study: Smartphone.
2. Travel & tourism industry (Collins and Parsa, 2006; Hung et al., 2010). Representative product in this study: Rental car (rental for 1 week).
3. Retail and consumer goods industry (Codini et al., 2012). Representative product in this study: Winter coat.
4. Pharmaceutical industry (Provines, 2010; Dittmer, 2017; Garner et al., 2017; Garrison and Towse, 2017; Danzon, 2018; Shaker and Greenhawt, 2018; Garrison et al., 2019; Parmar et al., 2019; Jommi et al., 2020). Representative product in this study: Headache-relieving pills.

3.4 Data Collection Methods

In order to respond to research questions RQ₁ and RQ₂, both quantitative and qualitative data were collected. The quantitative data was collected with an online questionnaire in a cross-sectional time horizon, addressing the consumer

perspective of prices in the four main industries investigated. In the online questionnaire survey, 792 German consumers responded, and a mixed form of quota sampling and convenient sampling was applied. The quantitative data was collected between October 2019 and February 2020. Consumers were asked about their willingness-to-pay for the selected product from each of the four industries. Questions were stated to ensure a proper analysis of their price sensitivity and willingness-to-pay based on van Westendorp's Price Sensitivity Meter (van Westendorp, 1976). The analysis for RQ₁ was conducted in SPSS Statistics v. 26 and Microsoft Excel 2016.

For RQ₂, the idea was to delve deeper into the daily business of pricing practitioners, to investigate realistic scenarios of the usage and implementation of VBP. According to Flick et al. (2008), qualitative data is most useful for analyzing the daily business of an interviewee. Thus, in the qualitative data collection process of this study, semi-structured expert interviews (SSI) were conducted, reflecting the advantages of flexibility during the interview to be open to unexpected topics or issues (Adams, 2015).

The qualitative data was collected in a longitudinal time horizon, as expert interviews were conducted over a time span of several months in a small number with constant adaptations of the expert interview guideline. This approach reflects a grounded theory methodology (Strauss and Corbin, 1994). The telephone interview approach was chosen due to the physical distribution of the interviewed pricing experts across Germany and because of mandatory limitations due to the corona virus precautions imposed by the German government in spring 2020. A purposive selection method was used to collect knowledge from pricing experts. In total, 20 pricing experts from four different industries were interviewed. The sample size 20 was utilized because responses started to repeat consistently after the first 10 to 12 interviews. Therefore, it was very likely to state that responses would even further repeat and overlap if more interviews had been conducted.

Tab. 1: Overview of interviewed experts

Expert	Industry	Company type	Company size by number of employees
1	Pharmacy	Consulting	50
2	Retail	Consulting	1,000
3	Technology	Industry	140,000
4	Retail	Consulting	600
5	Technology	Consulting	70
6	Technology	Consulting	40
7	Retail	Consulting	50
8	Technology	Consulting	20
9	Technology	Consulting	5
10	Travel & Tourism	Consulting	5
11	Travel & Tourism	Consulting	12
12	Pharmacy	Industry	75
13	Technology	Industry	25
14	Technology	Industry	10
15	Retail	Industry	1,500
16	Retail	Industry	105
17	Pharmacy	Industry	60,000
18	Travel & Tourism	Industry	1,500
19	Travel & Tourism	Industry	750
20	Pharmacy	Industry	120

Source: Authors' qualitative data collection ($n = 20$)

The pricing experts were partially from consulting companies with their clients being companies from one of the four industries, or directly pricing representatives from industrial companies from one of the four industries. An overview of the interviewed pricing experts with their industry, company type and size is shown in Tab. 1.

As one part of the interview, the experts were asked to evaluate the fourteen most significant obstacles defined in the literature review on a slightly adapted Likert scale from 1 (strongest obstacle) to 5 (weakest obstacle) based on their experience (Likert, 1932). This evaluation was a basic pillar in the response to RQ₂. The qualitative data was collected in German language, coded by topic and context in MAXQDA and then translated, based on the qualitative content analysis guideline by Mayring and Brunner (2009). The data analysis tools employed in the scope of this research study are described in the following chapter.

3.5 Data Analysis Tools

3.5.1 Data Analysis Tool for RQ₁

In order to respond to research question RQ₁, van Westendorp's price sensitivity meter was utilized (van Westendorp, 1976). By using van Westendorp's tool, the subsequent six values could be generated for each of the four products (Ceylana et al., 2014):

- Optimum price point (OPP, intersection of 'too cheap' and 'too expensive' curves),
- Indifference price point (IDP, intersection of 'cheap' and 'expensive' curves),
- Point of marginal cheapness (PMC, intersection of 'expensive' and 'too cheap' curves),
- Point of marginal expensiveness (PME, intersection of 'cheap' and 'too expensive' curves),
- Range of acceptable prices (ROAP, range between PMC and PME),
- Gap of IDP and OPP (range between IDP and OPP).

The following assumptions can be made based on van Westendorp's analysis:

1. The narrower the range of acceptable prices, the higher the price sensitivity is among the consumers for that product.
2. The closer the IDP and OPP are, the higher the price sensitivity is among consumers for that product (Reinecke et al., 2009).

It needs be stated that the two previously mentioned assumptions cannot be directly applied to all products from all industries by simply using the absolute numerical value because of potentially large initial price differences between, for instance, a smartphone and a pharmaceutical drug. The absolute value of a consumer's possible range of acceptable prices (ROAP) for a smartphone may be from €500 to €750, i.e., €250, while for the headache pills the ROAP may be from €10 to €15, thus, €5. This may lead to untruthful assumptions like a failed evaluation of price sensitivity between these two products.

Therefore, before creating any conclusive statement about a consumer's ROAP with absolute figures, the ROAP for each product needed to be put into relation. To achieve this, the authors created a relative range of acceptable prices (RROAP). This relative range simply represents the range of acceptable prices (ROAP), calculated as $PME - PMC$, but with an added denominator being the minuend, PME . Using the point of marginal expensiveness here creates the needed relation to be able to compare the ROAP of two or more products. Therefore, the authors derived the formula 1 stated below to address the first assumption from above:

$$RROAP = \frac{PME - PMC}{PME} \cdot 100 \quad [\%] \quad (1)$$

Next, assumption 2 needed to be addressed. For this assumption, the gap between IDP and OPP was calculated, but use of absolute figures could lead to the same issues as with assumption about RROAP (1). Therefore, the gap of IDP and OPP, calculated as $IDP - OPP$, needed to be put into relation as well by using the denominator being the former minuend,

IDP. Thus, the authors derived the formula stated below to address assumption RGIO (2):

$$RGIO = \frac{IDP - OPP}{IDP} \cdot 100 \quad [\%] \quad (2)$$

For each of the observed four products from the four different industries, both the RROAP and the RGIO were calculated in % and compared. To reduce complexity within this approach, the mean between RROAP (in %) and RGIO (in %) was taken for each product to give a final percentage value, the Mean Score of Relative Values (MSRV). Thus, the MSRV was calculated as:

$$MSRV = \frac{RROAP + RGIO}{2} \quad [\%] \quad (3)$$

3.5.2 Data Analysis Tool for RQ₂

Research question RQ₂ was focused on the business perspective and aimed to identify in which industry an implementation of value-based pricing is most difficult. In total, 20 experts from the four analyzed industries were questioned in semi-structured expert interviews. As part of the interview, each pricing expert was asked to evaluate the fourteen most significant obstacles found in the literature review on a slightly adapted Likert scale from 1 (strongest obstacle) to 5 (weakest obstacle).

In order to respond to research question RQ₂, a statistical tool was utilized. To identify the appropriate statistical test, the sample data needed to be categorized. The type of data was ordinal, as ranks between 1 to 5 were given by the pricing experts. To test a potential normal distribution among the collected data, a Shapiro-Wilk normality test was used. Tab. 2 provides the results of the Shapiro-Wilk test, indicating that the significance is far below the level 0.05 for each of the four industries, thus, there was no normal distribution in the data sets. To ensure validity of the stated conclusion regarding normality, the Kolmogorov-Smirnov test was used as well and led to the same outcome.

Tab. 2: Results of the Shapiro-Wilk normality test

	Shapiro-Wilk statistic	Shapiro-Wilk significance
Pharmacy	0.782	< 0.001
Travel & Tourism	0.867	< 0.001
Technology	0.921	< 0.001
Retail	0.909	< 0.001

Source: Pricing expert interviews, $n = 20$

As the distribution of responses to each score by industry did not follow a normal distribution, a non-parametric test was to be used. Further, the differences within unrelated, independent samples were to be investigated for the purpose of responding to RQ₂. Four samples

were analyzed (Technology industry, Pharmaceutical industry, Retail industry, Travel & Tourism industry). These are the prerequisites for using a Kruskal-Wallis H test (Vargha and Delaney, 1998). As the mean ranks and distributions between the four samples were investigated between each other, six different individual comparisons needed to be made within the Kruskal-Wallis H test. The level of significance α was 0.05 with a confidence interval of 95%. As $n = 280 > 30$, the asymptotic significance was used instead of the exact significance value. In order to reduce the risk of α error accumulation, a post-hoc Bonferroni adjustment was used within the Kruskal Wallis H test analysis.

4 RESULTS

As discussed in the literature review, it can be stated that the lower a consumer's price sensitivity, the higher the chances for a successful implementation of value-based pricing. This was the basic assumption for research question RQ₁. To respond to RQ₁, the German consumers' price sensitivities were evaluated with van Westendorp's price sensitivity meter. The four values of MSRV (Mean score of relative values) for the four analyzed products were eventually compared to derive a response to RQ₁. The results of the van Westendorp's Price Sensitivity Meter analysis are shown in Fig. 1.

Tab. 3 shows the price points derived from the quantitative data analysis.

As can be seen in Tab. 3, the smartphone, representing products from the technology industry, showed the lowest price sensitivity among the four products observed based on van Westendorp's price sensitivity meter. The winter coat showed a similar but slightly lower mean score of relative values and ranked 2nd of the products with the lowest price sensitivity. The headache pills representing products from the pharmaceutical industry showed a higher price sensitivity among consumers than a rental car. This concludes that consumers are very price-focused when choosing a rental car with a

high sensitivity towards prices and that they are likely to compare prices before their purchasing decision is made. Further, consumers are even more price sensitive when choosing a box of headache-relieving pills. Thus, RQ₁ can be responded to: In which German industry are the customer-based obstacles to the implementation of value-based pricing the strongest?

The largest customer-based obstacles to an implementation of value-based pricing seem to be in the pharmaceutical industry.

H₀: The customer-based obstacles to an implementation of value-based pricing in the technology industry are higher than or the same as in other analyzed industries.

Based on this study, German consumers show a lower price sensitivity for technological products than to other analyzed products. Thus, H₀ can be rejected.

To respond to research question RQ₂, the interviewed pricing experts evaluated the 14 most frequently named obstacles to implement VBP on the adjusted Likert scale with values ranging from 1 to 5, with 1 meaning the strongest weight, or the obstacles with the highest relevance in business practice. The results are shown in Tab. 4.

When the mean scores and mean ranks of all 14 obstacles were calculated by industry, the

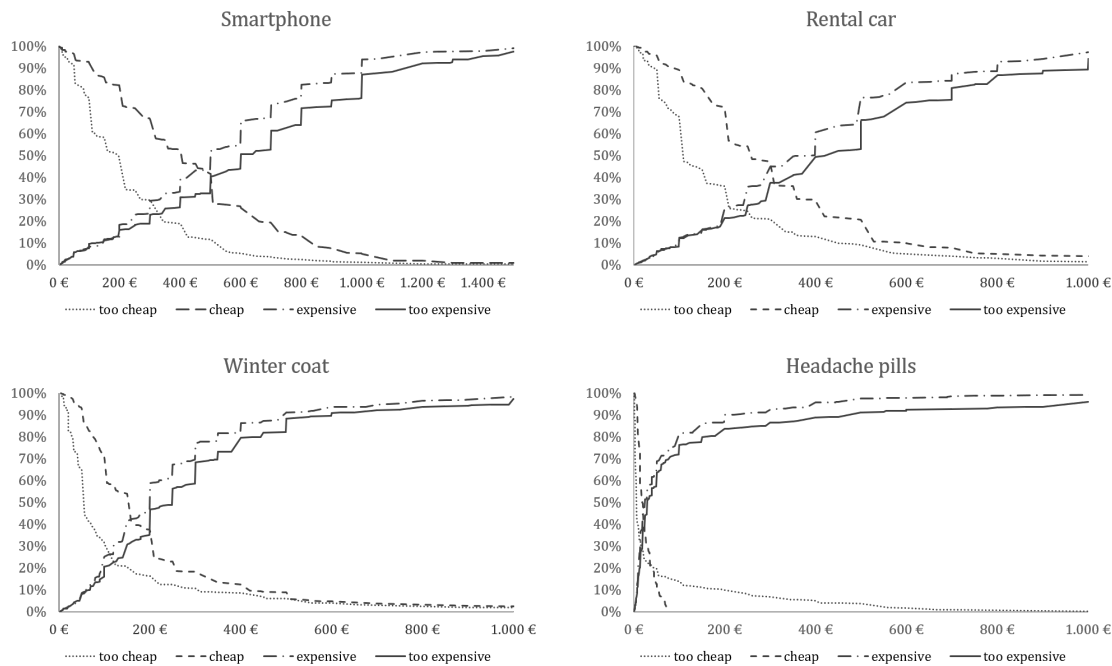


Fig. 1: van Westendorp's Price Sensivity Meter applied to the four products
Source: Questionnaire survey, 2019/2020, $n = 792$

Tab. 3: Price points of the four investigated products

Price points	Smartphone (technology)	Rental car (travel & tourism)	Winter coat (retail)	Headache pills (pharmaceutical)
Optimum price point (in EUR)	329	247	120	18.00
Indifference price point (in EUR)	477	302	158	20.20
Point of marginal cheapness (in EUR)	301	209	112	14.50
Point of marginal expensiveness (in EUR)	499	308	198	23.20
Range of acceptable prices (in EUR)	301–499	209–308	112–198	14.50–23.20
Relative range of acceptable prices (RROAP) (in %)	39.7	32.1	43.4	37.5
Relative gap of IDP and OPP (RGIO) (in %)	31.0	18.2	24.1	10.9
Mean score of relative values (MSRV) (in %)	35.4	25.2	33.8	24.2
Rank of lowest price sensitivity based on MSRV	1	3	2	4

Source: Questionnaire survey, 2019/2020, $n = 792$

following results could be found. In Tab. 5, the column Number of ratings was derived from the number of experts multiplied by the number of obstacles (14) where a rank was asked to be given by the expert. Further, the mean score and the mean rank for each of the industries was calculated. In total, the 14 obstacles were ranked by 20 experts, resulting in 280 scores. These 280 scores served as the new sample size n for the statistical analysis conducted here.

For value clarification, it must be stated that 'obstacles are lower' refers to the fact that the mean score of obstacles is 'higher'. That is because the strongest obstacle received the lowest value 1, while the weakest obstacle was evaluated with the highest value 5. Therefore, the higher the obstacles in reality, the lower the mean score of obstacles in this analysis. Based on Tab. 5 it can, therefore, be stated that in the pharmaceutical industry, the mean score

Tab. 4: Industry-specific obstacles to the implementation of value-based pricing

Rank	Technology	Travel & Tourism	Retail	Pharmacy
1	Missing data (1.80)	Habit of using traditional pricing methods (1.25)	Difficulties in assessing the customer perceived value (1.20)	Customer's feeling of injustice (1.25)
2	High costs and complexity (2.03)	Danger of customer loss (1.25)	Different perception of value by seller and buyer (1.50)	Difficulty in communicating the value of the product to the customer (1.25)
3	Habit of using traditional pricing methods (2.20)	Customer's feeling of injustice (1.25)	Lack of experience and skills (1.50)	Different perception of value by seller and buyer (1.25)
4	Difficulties in assessing the customer perceived value (2.60)	Difficulties in assessing the customer perceived value (1.50)	Missing data (1.53)	Missing data (1.25)
5	Lack of experience and skills (2.69)	Lack of experience and skills (1.50)	Habit of using traditional pricing methods (2.33)	Lack of availability of suitable tools (1.25)
6	Difficult market segmentation (2.69)	Difficulty in communicating the value of the product to the customer (1.75)	Difficult market segmentation (3.00)	Habit of using traditional pricing methods (1.25)
7	Lack of availability of suitable tools (2.80)	Product-oriented sales culture (1.75)	Difficulty in communicating the value of the product to the customer (3.00)	Lack of support from top management in implementing value-based pricing (1.50)
8	Difficulty in communicating the value of the product to the customer (2.80)	Lack of motivation of the respective department (2.00)	Product-oriented sales culture (3.40)	Lack of experience and skills (1.50)
9	Lack of motivation of the respective department (3.03)	Lack of support from top management in implementing value-based pricing (3.50)	High costs and complexity (3.50)	Product-oriented sales culture (1.75)
10	Product-oriented sales culture (3.14)	Missing data (3.50)	Lack of support from top management in implementing value-based pricing (3.80)	Danger of customer loss (1.75)
11	Different perception of value by seller and buyer (3.25)	Different perception of value by seller and buyer (3.75)	Lack of motivation of the respective department (4.20)	Difficulties in assessing the customer perceived value (3.00)
12	Lack of support from top management in implementing value-based pricing (3.31)	Lack of availability of suitable tools (4.00)	Lack of availability of suitable tools (4.27)	High costs and complexity (3.25)
13	Customer's feeling of injustice (3.49)	High costs and complexity (4.25)	Danger of customer loss (4.27)	Difficult market segmentation (4.00)
14	Danger of customer loss (3.80)	Difficult market segmentation (5.00)	Customer's feeling of injustice (4.40)	Lack of motivation of the respective department (4.00)

Source: Pricing expert interviews, $n = 20$

Tab. 5: Mean scores and mean ranks of obstacles by industry

Rank	Industry	Experts	Number of ratings	Mean score	Mean Rank
1	Pharmacy	4	56	2.02	98.48
2	Travel & Tourism	4	56	2.59	135.11
3	Technology	7	98	2.83	152.52
4	Retail	5	70	2.99	161.60

Source: Pricing expert interviews, $n = 20$

was lower than in the other three industries. To determine if the differences in distributions were statistically significant, a statistical tool was needed to compare the mean ranks and distributions of obstacles to VBP among the different industries. A summary of the independent samples Kruskal-Wallis H test is shown in Tab. 6.

Tab. 6: Summary of Independent samples Kruskal-Wallis H test

Total N	280
Test Statistic	23.048*
Degree of Freedom	3
Asymptotic Significance (2-sided test)	< 0.001

Note: *) The test statistic is adjusted for ties.

Source: Pricing expert interviews, $n = 20$

It needs to be added here that the risk of α error accumulation existed for this type of test, as $\alpha = 0.05$ was taken for each individual test between any two samples. In total, six tests were conducted, leading to a total accumulated α error of $0.05 \cdot 6 = 0.3$. Thus, by simply looking at the significance values of the Kruskal-Wallis H test, the robustness of the test could hardly be increased. In order to reduce the risk of α error accumulation, a post-hoc Bonferroni adjustment was used to find an adjusted significance value for each of the six tests between the four groups and, thus, enhance robustness of the method. This was done by using an adjusted $\alpha = 0.05/6 = 0.0083$ for each test. Tab. 7 provides an overview of the test results of the Kruskal-Wallis H test for the four independent samples, including a post-hoc Bonferroni correction for the adjusted significance value determination.

These results could, therefore, be interpreted and conclusions for H_0 could be drawn. The Bonferroni-adjusted significance levels for each of the six conducted tests now need to be compared to the significance threshold of $p = 0.05$. If the adjusted significance value is lower than 0.05, H_0 must be rejected. If the adjusted significance level is higher than 0.05, H_0 cannot be rejected. Tab. 8 illustrates the conclusions for the null hypothesis.

In conclusion, as in at least one Sample1-Sample2 comparison the adjusted significance level was lower than 0.05, H_0 can be rejected. There seemed to be differences in the distributions between the analyzed industries. Particularly, the differences between the Pharmacy-Technology and the Pharmacy-Retail pairs were statistically significant. A response to research question RQ_2 could, thus, be given:

RQ_2 : Are there significant differences between the obstacles in the industries analyzed? Based on the Kruskal-Wallis H test analysis of the 280 scores given by the 20 interviewees from four different industries, it can be stated that there are significant differences between the distributions of evaluated obstacles, namely within the pairs Pharmacy-Technology and Pharmacy-Retail.

H_0 : There is no significant difference in the distributions of the obstacles between the industries analyzed. The Kruskal-Wallis H test analysis with Bonferroni adjustment has shown that there is a statistically significant difference in the distributions of the evaluated obstacles between the industries analyzed. Therefore, the null hypothesis can be rejected.

Tab. 7: Results of Kruskal-Wallis H test with Bonferroni correction

Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Significance	Adj. Sig.*
Pharmacy-Travel & Tourism	-36.625	15.032	-2.436	0.015	0.089
Pharmacy-Technology	-54.038	13.324	-4.056	< 0.001	< 0.001
Pharmacy-Retail	-63.118	14.260	-4.426	< 0.001	< 0.001
Travel & Tourism-Technology	17.413	13.324	1.307	0.191	1.000
Travel & Tourism-Retail	26.493	14.260	1.858	0.063	0.379
Technology-Retail	9.080	12.448	0.729	0.466	1.000

Notes: *) Significance values have been adjusted by the Bonferroni correction for multiple tests.

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same. Asymptotic significances (2-sided tests) are displayed. The significance level is 0.05.

Source: Pricing expert interviews, $n = 20$

Tab. 8: Kruskal-Wallis H test with Bonferroni correction and conclusion for null hypothesis

Sample 1-Sample 2	Significance	Adj. Sig.*	Adj. Sig.* $\leq 0.05?$	Conclusion for H_0
Pharmacy-Travel & Tourism	0.015	0.089	No	H_0 not rejected
Pharmacy-Technology	< 0.001	< 0.001	Yes	H_0 rejected
Pharmacy-Retail	< 0.001	< 0.001	Yes	H_0 rejected
Travel & Tourism-Technology	0.191	1.000	No	H_0 not rejected
Travel & Tourism-Retail	0.063	0.379	No	H_0 not rejected
Technology-Retail	0.466	1.000	No	H_0 not rejected

Notes: *) Significance values have been adjusted by the Bonferroni correction for multiple tests.

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same. Asymptotic significances (2-sided tests) are displayed. The significance level is 0.05.

Source: Pricing expert interviews, $n = 20$

5 DISCUSSION

The results of this study were extracted from the first author's doctoral dissertation about the obstacles to an implementation of value-based pricing.

Previous studies have already focused on the benefits and the future potential of value-based pricing along with the identification of certain obstacles to the implementation of VBP (e.g. Hinterhuber, 2008a; Hinterhuber and Bertini, 2011; Michel and Pfäffli, 2012; Töytäri et al., 2015; Töytäri et al., 2017; Nagle and Müller, 2018; Reynolds, 2018). The advantages of using VBP successfully have widely been described as value maximization (Jommi et al., 2020), higher effectiveness (Reynolds, 2018), granting consumer surplus to the producer (Danzon, 2018), and the superiority in comparison to other pricing method alternatives (Drummond and Towse, 2019). Researchers have, therefore,

recommended to consider an implementation of VBP not only because of the large profit potential (Hünerberg and Hüttmann, 2003; Piercy et al., 2010).

Some barriers to the implementation of VBP in industry-specific contexts have been identified by previous studies, however, these studies usually focused on the barriers only in specific industries: Töytäri et al. (2015), Liinamaa et al. (2016) and Kienzler (2018) identified barriers in the technology industry, while Collins and Parsa's (2006) and Hung et al.'s (2010) research focused rather on the travel and tourism industry. The retail or consumer goods industry as market for implementing VBP was investigated by Codini et al. (2012). Lastly, the pharmaceutical industry has received very recent interest in terms of the obstacles to implement VBP by Provines (2010), Dittmer (2017), Garner et

al. (2017), Garrison and Towse (2017), Danzon (2018), Shaker and Greenhawt (2018), Garrison et al. (2019), Parmar et al. (2019), and Jommi et al. (2020). Thus, conclusions about the obstacles to implement VBP have been ambiguous and highly industry-specific. Barriers that were found by researchers in the pharmaceutical industry may not be valid barriers in the technology industry, and vice versa.

The theoretical contribution of this research study was, thus, the comparison of obstacles to implement VBP among industries which had not yet been drawn in previous research studies, enhancing the relevance of this paper and opening up further research potential. The customer-based obstacles to implement VBP based on one of the underlying principles of VBP, price sensitivity, has never been compared among four products from four different German industries. It was found that for the technology industry, customer-based obstacles to implement VBP were lower than for the other industries investigated.

Furthermore, the evaluation of the degree of existing obstacles to implement VBP in these four industries by interviewing pricing business practitioners had not yet been focused upon. This study has evaluated the degree of the obstacles and how strongly they impact businesses in four different industries, making the barriers comparable. It was found through the Kruskal-Wallis H test that the distributions of the obstacles vary significantly across industries. This allows the conclusion that broad recommendations to overcome certain barriers are not applicable across industries and may rather apply for certain industries solely. In addition, the connection of the consumer perspective as well as the business perspective through collecting both quantitative and qualitative data in the same research study about VBP obstacles was lacking so far. Most research studies either focused on the obstacles to implement VBP in one specific industry and from one perspective, either consumer or business, making it hardly possible to compare or evaluate barriers on a cross-industry basis. These newly discovered insights epitomize a significant theoretical contribution.

Still, the empirical results reported in this study must be considered in light of some limitations. For each industry, only one product was used as a representative product. This one product then led to conclusive statements and recommendations for the whole industry, which represents a limitation. In retail, the winter coat was used. Would the results be similar if instead of a winter coat, an FMCG product would have been chosen? Or in the technology industry, would a flatscreen TV or a power bank have led to similar results as the analysis of the smartphone has? These are interesting questions that could not be responded to in the scope of this study and they provide large potential for future research.

Second, the quantitative empirical data collected in the scope of this study were 792 German inhabitants, spread across Germany as online panels were used for the data collection. The very broad distribution across Germany did not take into account region-specific characteristics, such as a possibly different willingness-to-pay between metropolitan and rural areas in Germany. Further, in research question RQ₁, consumers were asked about their willingness-to-pay for four different products. Consumer-specific characteristics like a possible affinity towards technology products and, thus, a higher willingness-to-pay were not considered.

Besides, for research question RQ₂, only the 14 most frequently named obstacles from literature were investigated. Pricing experts from the four industries investigated were asked to evaluate and rank the weight and frequency of these obstacles in business practice. However, there may have been other obstacles neither evaluated nor mentioned by the pricing experts interviewed. For the scope of this study, only a reduced number of obstacles to the implementation of value-based pricing could be taken to the experts, representing another research gap.

After the investigation and interpretation of the results, a critical view of these results needs to be taken to put them into perspective. First, the data collection timeframe needs to be reviewed. The quantitative data was collected mostly in autumn and winter of 2019, where an economic boom with economic success swept

Germany. The qualitative data, however, was collected in the spring of 2020, where the emergence of the new CoVid-19 coronavirus tremendously impacted the worldwide economy and led to a moderate economic recession. Therefore, the quantitative data collection and the qualitative data collection were conducted in different economic stages, one during a boom and one during a moderate recession. These unequal economic circumstances may have influenced the collected data and possibly led to diverging situational behavior or responses.

Second, the statement that only a very low number of companies already utilized value-based pricing may possibly be flawed. In research as well as in business practice, there is no distinct point defined from where value-based

pricing starts. It may be the case that several companies have already implemented value-based pricing into their corporate decision-making without knowing it or without actually having devoted resources to the implementation. That is yet to be researched.

Third, in response to research question RQ₁, the authors have created a formula to determine the RROAP and MSRV. These formulas and eventual values are likely to reflect the quantitative data collected; however, they are not historically proven or widely accepted standards. It would be interesting to see whether these formulas reflect reality when applied in other studies or whether they require possible adjustments in the future.

6 CONCLUSION

Several pricing methods have been identified in literature and are used by business practitioners and companies across all industries. In today's literature, value-based pricing is seen as the most profitable pricing method available, while frequently used methods like cost- or competition-based pricing seem to have tremendous disadvantages. Cost-based pricing can lead to unexploited profit margins and pricing too low, while competition-based pricing is likely to lead to downward price spirals, decreasing profits in the long run. Both pricing methods have one major mistake in common, neglecting the customer perceived value. Starting the pricing process on the customer side instead of the business or manufacturer's side can lead to significant conclusions if a proper customer analysis is conducted.

Value-based pricing epitomizes the process of pricing products based on the customer perceived value and this method can lead to higher average prices which are still paid by the consumer, as the consumer perceives them as fair, value-reflecting prices. Therefore, value-based pricing allows companies to exploit different consumer segments' willingness-to-pay, increasing the possibility of higher sales figures even when prices are increased.

In business practice, cost- and competition-based pricing seem to be relatively easy to implement, while VBP seems to be implemented only rarely by companies. The reasons for this observation are that several barriers to the implementation of VBP run rampant. These obstacles include organizationally induced barriers, externally induced barriers, managerial biases, customer-based barriers, and very specific barriers in different industries.

This research study has taken a deeper look into the topic of value-based pricing and the obstacles impeding its successful implementation. Questionnaire survey ($n = 792$) among German consumers was collected as well as 20 semi-structured interviews with German pricing experts were conducted. In research questions RQ₁ and RQ₂, the industry-specific barriers to an implementation of value-based pricing were investigated.

First, in RQ₁, the consumer side was analyzed. The outcome was that German consumers show a lower price sensitivity for technological products than to other products from the analyzed retail, pharmaceutical or travel & tourism industries. Therefore, the conclusion was made that German consumers are not stable in their price sensitivity across indus-

tries, but rather more targetable for VBP by companies operating in technological markets in comparison to other industries. Further, this research has shown that the pharmaceutical industry entails the biggest customer-based obstacles to a successful implementation of value-based pricing.

Second, in RQ₂, the business side was analysed and pricing experts were asked to rank the 14 most common obstacles to the implementation of VBP based on their perceived weight and frequency in business practice. A statistical non-parametric Kruskal-Wallis H test with Bonferroni adjustment was employed to test the statistical relevance and to see whether the distributions of the evaluated obstacles to value-based pricing are different between

the industries analyzed. The derived conclusion shows that the distributions of the evaluated obstacles differ across industries, suggesting that the obstacles vary greatly in their weight or degree depending on the industry. Again, the pharmaceutical industry was found to experience the most severe obstacles also from a company perspective.

The authors of this study highly encourage researchers to devote resources to the highly relevant trend towards the most profitable pricing method. Every piece of research aids the facilitation process of the implementation of VBP into business practice and contributes to literature on a topic that has not yet received the attention it certainly merits.

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