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„Forecasting Willingness-to-Pay with Direct Price Elicitation:
The Moderating Role of Consumer Characteristics“

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Preface

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1 Introduction

One of the first lessons for a marketing student is the 4 Ps concept of price, product, promotion and place, which defines the basic environment and goals of marketing (Jobber, 2006). Within this illustrative framework, “price is the only marketing strategy variable that directly generates income. All the other variables in the marketing mix generate costs: advertising and promotion, product development, selling efforts, distribution, packaging – all involve expenditures” (Monroe, 2002, p. 8). As a consequence, the definition of a product's price is a crucial determinant for the entire success of an enterprise. Research revealed that the price in fact has a sustainable impact on profit in practice (Garda & Marn, 1993; Marn, Roegner, & Zawada, 2004).

Despite the importance of pricing for a company's profitability, it is rarely based on estimates of buyer behavior (Monroe & Cox, 2001). Even so, the prediction of buying behavior in the form of willingness-to-pay estimates is essential for optimal pricing decisions (Balderjahn, 2003). The aim of this study is to provide practitioners with a usable forecasting technique of willingness-to-pay. Such forecasts are understood as a prerequisite for effective pricing strategies as they allow to “plan for the future and to make rational decisions” (Armstrong, 2001, p. 3). The challenge regarding these forecasts lies in meeting the conflicting demands of accurately and practically measuring willingness-to-pay.

The preceding literature has already developed reliable measurement methods for willingness-to-pay. Derivations of auctions or lotteries provide relatively accurate results of consumer's willingness-to-pay (e.g., Skiera & Revenstorff, 1999; e.g., Wertenbroch & Skiera, 2002) though their practical usage has been largely disregarded though. For accurate measurements, the product under investigation need to be sold to the respondents, resulting in greater complexity and costs. Alternative methods not dependent on selling to the respondent exist, but suffer from validity concerns. Especially the contingent valuation which directly asks the respondents to state their willingness-to-pay for a given product represents a cheap and flexible measurement approach. However, respondents are

known to generally give higher willingness-to-pay values in the hypothetical contingent valuation than result in a real buying situation (cf. Harrison & Rutström, 2002) and thus bias the results.

An assessment of consumers' uncertainty in their answer represents an approach to correct this measurement error. First successes have already been published (e.g., Blumenschein, Blomquist, Johannesson, Horn, & Freeman, 2008). On the basis of these results, this study further analyzes consumers' purchasing behavior and identifies product knowledge, product involvement and preference uncertainty as important indicators for consumers' uncertainty in the purchase situation. More specifically, consumers with high product knowledge, high involvement and well-established preference patterns are supposed to be able to determine their willingness-to-pay judgments with higher certainty. This relationship is tested for its applicability to calibrate the measurement of willingness-to-pay. The result would be an enhancement of the contingent valuation's accuracy.

The results do not clearly indicate the interaction effects between the consumers' uncertainty and the accuracy of directly measured willingness-to-pay. Thus, the elaborated hypotheses are dismissed and the methodological contribution of the forecasting technique was not successful. Nevertheless the results strongly prove the precarious overestimation of consumers' willingness-to-pay in the hypothetical situation. The raw contingent valuation measurement should clearly not be used for uncritical derivation of pricing decisions. Since the proposed consumer characteristics could not fully explain the overstatements, different cognitive processes are supposed to exist between real and hypothetical willingness-to-pay elicitation. The clear message of this study is the importance of further research and deeper investigation of the process how willingness-to-pay is determined.

The study is organized into five chapters. The first chapter examines the importance of pricing, highlights the relevance of forecasting and justifies the research objective. The aim of this chapter is to orient the study toward the specific requirements of forecasts. In the second chapter, the problem areas and biases of measuring willingness-to-pay are

discussed. Additionally, the existing measurement methods are evaluated according to their accuracy and practicability. As a result, the contingent valuation is chosen as to best meet the criteria concerning forecasts. Its shortcomings concerning validity and their possible corrections are then elaborated in the third chapter. Indications for the decisive role of uncertainty in willingness-to-pay formations are discussed. The theory of the moderating role of consumer characteristics in the willingness-to-pay elicitation is established and concrete hypotheses are formulated. The fourth chapter covers the empirical testing of the proposed relationships and features an insightful comparison of the different measurement methods. In the final chapter possible reasons for the failure of the established theory are discussed while providing directions for further research.

2 Pricing Decisions and their Information Needs

2.1 Companies' Price and Consumers' Value

Kotler and Armstrong (2009, p. 289) define price as “the amount of money charged for a product or service, or the sum of the values that consumers exchange for the benefits of having or using the product or service”. This definition first and foremost relates the monetary amount to the value the consumer is perceiving. The price is not necessarily determined by production costs. Fiat for instance sells its Fiat Tipo higher than the Fiat Uno because it offers higher comfort, although its production is actually cheaper (Jobber, 2006). In contrast to cost-based pricing, the price estimation is already conducted before the production, since the value determines the decision for attractiveness of a market and the features needed (Breidert, 2006). In reality, companies often base their pricing on cost-oriented considerations (cost-based pricing) rather than what consumers are actually willing-to-pay – so-called value-based or demand-based pricing (Shipley & Jobber, 2001). Adapting prices from competitors, using intuitive pricing or mark-up pricing are dominant decision strategies for managers (Levy, Grewal, Kopalle, & Hess, 2004; Monroe, 2002). As a consequence, large profit potentials remain unexploited (Garda & Marn, 1993; Marn et al., 2004).

2.1 Companies' Price and Consumers' Value

For rational pricing decisions, the knowledge of the price response function is of indispensable importance (Simon & Fassnacht, 2008). The price response function links the quantity sold to the price of the product and provides information how price-sensitive consumers are. Its concept is similar to the demand function, but not the same. The demand function specifies how a whole market reacts to changing prices, whereas the price response function deals with the demand for the product of a single seller as a function of the price requested by this seller (Phillips, 2005). In simple terms, the price response function tells managers how many people will buy the product at differing price levels.

In the discussion of pricing, it must, however, not be forgotten that prices are set in a competitive environment. A price change will most likely lead to immediate reactions of the competitors eliminating the gained price advantage. Obviously, price is not an adequate way to differentiate the own product from the competitors' offers in a free market, if the higher price is not founded on a competitive advantage like strong brand or cost advantage (Breidert, 2006). Yet, the price together with other factors can be used to successfully differentiate the own product or service from the competition. Product Differentiation is in general based on the identification of consumer segments and their specific demands (Dickson & Ginter, 1987). Early adopters, people who have high interest in brand-new technologies, are a good example for a consumer segment willing to pay higher prices. In practice, a common error in pricing decisions is “pricing truly innovative products far too low.” (Hinterhuber, 2004, p. 768). Once the product is introduced, a price increase becomes more difficult (Simon & Fassnacht, 2008). Therefore it is essential to assess the perceived value by the consumers beforehand and identify profitable segments (Monroe, 2002). Nevertheless, also saturated markets may provide opportunities and possibilities for price increases. The trend of mass customization, for instance, emphasizes the need for customized pricing (Choudhary, Ghose, Mukhopadhyay, & Rajan, 2005). In any case, the price advantage has to be based on competitive advantages in a market or market segment; a simple price increase can not sustain (Marn et al., 2004).

For a successful segmentation of the market and the establishment of a price advantage, it does not suffice to know the demand of a market, but rather an estimation is needed how each individual customer values the product (Armstrong & Kotler, 2009; Völckner, 2006a). The maximum amount of money an individual is willing to spend for a certain product or service is known as willingness-to-pay in the literature (e.g., Wertenbroch & Skiera, 2002). Willingness-to-pay thus represents the sum of benefits a consumer might experience from a purchased product (Ryan & San Miguel, 2000). Kalish and Nelson (1991, p. 327) similarly define willingness-to-pay as “a direct monetary measure of product value.” The consumer will consider to buy a product if the price does not exceed his/her perceived utility of the product (Simon & Fassnacht, 2008). Demand curves of a whole market are in fact the aggregated individual willingness-to-pay values for a product or service (Phillips, 2005). Similar to the existing literature, the term reservation price will be used interchangeably with willingness-to-pay in this study.

For clarification, the term willingness-to-pay should not be confused with the terms willingness-to-buy nor willingness-to-accept. Willingness-to-buy refers to the buying decision of an individual in the form of a dichotomous choice. One can either choose to buy or not to buy a product. For example, researchers might be interested in the willingness to buy food via the Internet (e.g., Grunert & Ramus, 2005). In contrast, willingness-to-pay denotes the maximum price at which one is just willing to buy and is therefore a monetary value. Willingness-to-accept represents the minimum amount a seller is willing to receive for a certain product or service. Willingness-to-accept takes the perspective of the seller who is trying to maximize his/her earnings from the purchase (e.g., Simonson & Drolet, 2004).

2.2 Price as a Marketing Tool

The already given definition of price by Armstrong and Kotler (2009) further implies that price is not a fixed value, but a variable that is charged by the producer. The setting of prices should be regarded as a powerful marketing tool rather than a given fact. Although price being one component of the famous 4Ps framework, it is often neglected. In practice

2.2 Price as a Marketing Tool

managers frequently focus more on market share gains and cost reductions (Marn et al., 2004). However, the conflict between high market share and price leadership is not always the case. “In a variety of industries, from software to pharmaceuticals, specialty chemicals to cars, aircraft to apparel, it is quite common for the premium price brand to also be the market leader. [...] High market share and high prices can be achieved if prices truly reflect high customer value” (Hinterhuber, 2004, p. 766).

An important advantage of the factor price is that contrary to research and development, advertising and cost reductions, a change in price does not mean any additional costs and has an immediate impact on profit (Marn et al., 2004). Even small changes can have a decisive impact on profit, as price is the most effective profit lever. A simple example of Simon and Fassnacht (2008) illustrates this statement well. The price of an industrial product may be for instance 100 € and the quantity sold may account for 1 million. Additionally, the fix costs may be 30 million and the variable costs 60 €/piece. In this situation, the company would earn 10 million €. For a comparison of the effect on the profit of these variables, let each of them improve by 10 percent while keeping all other factors constant. The profit from a 10 percent increase of the sales would lead to a profit increase of 40 percent. A 10 percent decrease of the variable costs would increase the profit about 60 percent and in the case of fix costs of 30 percent. However, a 10 percent increase of the price raises *ceteris paribus* the profit about 100 percent. The reason is quite obvious: the price directly affects the profit, whereas the increase in sales is partly offset by increased variable costs. The cost reductions have a lower impact on the company's profit as well. Yet, the price's effect on profit also holds in the negative case: a 10 percent decrease of the price means a decreasing profit of 100%.

Evidently, the made assumption of keeping the other factors constant is a simplification and does not hold in reality. A price increase will decrease the quantity sold. However, small changes of up to 3% in prices frequently do not significantly affect actual sales (Simon & Fassnacht, 2008). In a study of Dickson and Sawyer (1990), for instance 50%, of the interrogated supermarket shoppers could not correctly name the price of the prod-

ucts they had placed in their shopping cart. Additionally, the fact that many shoppers did not recognize price reductions is astonishing. Furthermore, the importance of the factor price is also documented in real world examples. For a sample of Fortune 500 companies “a 5% increase in average selling price increases earnings before interest and taxes (EBIT) by 22% on average, compared with the increase of 12% and 10% for a corresponding increase in turnover and reduction in costs of goods sold, respectively” (Hinterhuber, 2004, p. 766). Therefore, the price performance of a company should be regarded as a precondition to profitability.

2.3 Forecasting Willingness-to-Pay

Given the profit potential of price, profound research on consumers' demand is essential for the effectiveness of a pricing strategy (Jedidi & Zhang, 2002). However, only 8% to 15% of all companies base their pricing decisions on estimates of buyer behavior (Monroe & Cox, 2001). A gap between the economic theory of price and its application seems to exist as many price potentials are often not fully exploited (Simon & Fassnacht, 2008). The question arises why the estimation of consumers' willingness-to-pay is largely not considered as an essential factor in a company's pricing.

One reason for the negligence of implementing a price strategy is surely the missing commitment to adapt and exploit theoretical concepts of research in some branches (Simon & Fassnacht, 2008). Companies in a free market are usually believed to be “price takers”, with only little chance to adjust prices for their own products or services. Price is generally perceived to be set by the market and therefore not being manageable (Marn et al., 2004). It often seems that companies like the role as price takers, because they do not have to deal with it and can concentrate on cost reduction and market share increase (Hinterhuber, 2004). Statements like – “This does not work in our branch as our customers are highly price sensitive” – often attest limited interest (Simon & Fassnacht, 2008). Additionally, it is a common misbelief among managers that a 5% percent price decrease would be offset by 5% increase in sales (Simon & Fassnacht, 2008). As the above example showed, the impact of price and volume on profit is different. According to Marn

2.3 Forecasting Willingness-to-Pay

et al. (2004), only few markets experience a price elasticity, which would allow to profitably trade off price for volume. According to Simon and Fassnacht (2008) the branches of pharma industries, premium car part producers, telecommunication companies and airlines are positive examples where advanced price management systems are applied.

Besides the low awareness and high skepticism towards the price as a marketing tool, the practical difficulty of integrating willingness-to-pay data in the planning process may as well explain the low usage of market research for pricing decisions. As already mentioned, information about willingness-to-pay is, however, necessary for making good decisions (Balderjahn, 2003). Regarding the estimation of willingness-to-pay, theory and practice seem to have different demands of measurement methods. On the one hand researchers are quite successfully focusing on improvements in accuracy (e.g., Skiera & Revenstorff, 1999; e.g., Wang, Venkatesh, & Chatterjee, 2007; e.g., Wertenbroch & Skiera, 2002), on the other hand practitioners use the more practical methods like the conjoint analysis and the contingent valuation for pricing studies (Hartmann & Sattler, 2004). Accurate measurement methods are generally based on auctions and own the critical disadvantage that the product is actually sold to the respondents adding to cost, time and overall complexity. One may argue that the practitioners in general favor cheaper and easier methods, which are known to suffer from validity concerns.

In order to satisfy the practical requirements, this study aims to establish a new measurement approach in order to allow forecasts of willingness-to-pay. "Forecasting is the prediction of future values of a variable based on known or past values of that variable or other related variables" (Makridakis & Wheelwright, 1978, p. 684). The estimation of future sales, market size, market share and competitors' action are common subjects to be forecasted (Armstrong & Brodie, 1999). What is missing in practice are forecasts on the price dimension. The possibility of predicting consumers' willingness-to-pay enables an early identification of trends in consumers' demands and profitability of single segments. Forecasting involves reducing uncertainty of the future and is best used when it enables the organization to take advantage of future opportunities while avoiding future threats

(Makridakis & Wheelwright, 1978). The internal resources can be better allocated and the profitability of product differentiation can be better and earlier assessed. Since consumers' preferences change (Breidert, 2006), willingness-to-pay estimations are best conducted on a regular basis. Especially price sensitive industries would benefit from recurring willingness-to-pay forecasts of markets or product categories. Forecasts are accomplished in order to anticipate and recognize problems, threats and opportunities in the marketing plan (Cohen, 2005). Furthermore forecasting is also a central prerequisite for new products (Armstrong & Brodie, 1999). Willingness-to-pay forecasts imply advantages for this application field as well. The possibility of including willingness-to-pay in the planning process is in general seen as a critical element for a successful pricing strategy. Forecasting of willingness-to-pay is focusing on a greater flexibility and cost-efficiency. Against this background, it is worthwhile to identify the specific criteria, which allow to evaluate forecasting techniques.

2.4 Methodological Demands of Willingness-to-Pay Forecasts

In general, accuracy is also the primary performance criterion of a forecasting method (Makridakis & Wheelwright, 1978). In psychometrics and psychophysics the term validity is more commonly used than the term accuracy, as in contrast to accuracy no easily obtainable truth exists (Hulley, Cummings, Browner, Grady, & Newman, 2006; Mueller & Martorell, 1988). Validity denotes the degree of how much an instrument measures what it is designed for to measure (Craig & Douglas, 2005).

In the willingness-to-pay context, indicators for the validity of a measurement are face validity, internal and external validity. Due to their relevance for the comparison of results, these terms are briefly explained. *Face validity* is concerned with the plausibility of the measured results (Schreier & Werfer, 2007). This can be realized with additional control questions for concepts, which are supposed to be relevant for the measured construct. *Internal validity* deals with the “correct” representation of the relating data in the sample (Völckner, 2006a). Internal validity in the context of willingness-to-pay measurements is in general assessed on the basis of estimated price response functions

2.4 Methodological Demands of Willingness-to-Pay Forecasts

and their fit to the observed values (Skiera & Revenstorff, 1999; Wertenbroch & Skiera, 2002). *External validity* describes in how far the obtained results are close to the reality and therefore, how well a willingness-to-pay measurement holds in real purchase situations (Hulley et al., 2006). External validity is probably the most important criterion, as it provides information about the measurement's error.

Nevertheless, “forecasting should not be judged on the simple accuracy criterion but its role should be enlarged and be concerned with its ability to improve the decision making within organizations” (Makridakis, 1981, pp. 307-308). Therefore it is reasonable to extend the forecasting performance indicators beyond validity and consider the managerial implications for a company. Timeliness and costs represent important considerations for the choice of a forecasting method (Remus & Simkin, 1987). “Unless forecasts become available to decision makers at the time they are needed, their value is practically lost” (Winklhofer & Diamantopoulos, 2002, p. 163). Companies in volatile markets are dependent on flexible and quick forecasts in order to adapt prices to new situations. Additionally, the gain of accuracy a certain method provides must be contrasted with the associated costs. In situations where rough estimates are sufficient cheaper methods may be preferred. Even for small firms with lower budgets it may still be advantageous to base their pricing on rough measurements of consumers' willingness-to-pay than to rely on plain “gut feeling”. Finally, Makridakis and Wheelwright (1978) also consider the *ease of application* an important criterion for the choice of a forecasting method. This term reflects the complexity and the level of knowledge required for application as well as the ease with which it can be conveyed to the final user.

In order to achieve a meaningful trade-off between accuracy and costs in a specific situation, it is essential to know the differences among the existing approaches. The following chapter compares the applicability of existing measurement methods as forecasting techniques according to the discussed criteria. First of all, the problem fields of willingness-to-pay measurement are presented and consequently the shortcomings of existing methods emphasized.

3 Measuring Willingness-to-Pay

3.1 Measurement and Biases of Willingness-to-Pay Measurement

For quantitative forecasting, three conditions need to be met: first, there is information about the past; second, this information can be quantified in the form of data; third, it can be assumed that the pattern of the past will continue into the future (Makridakis & Wheelwright, 1978). The first two conditions relate to a measurement in the present, from which the willingness-to-pay in the future is inferred. As a consequence, quantitative forecasting of willingness-to-pay requires the usage of a measurement method. The third condition, known as the *assumption of constancy*, is especially critical in the context of willingness-to-pay and should be treated with caution. The circumstances of a willingness-to-pay measurement are rarely equivalent and may affect the given responses (Breidert, Hahsler, & Reutterer, 2006). In particular, the situational demand is an important factor in willingness-to-pay formation (Wertenbroch & Skiera, 2002; Völckner, 2006a). For instance the weather most likely has a large effect on the amount people would pay for a cold drink. For this reason the situations, in which the measurements are conducted, should closely resemble the future buying situation. Although past consumer behavior is not necessarily the same as future behavior, it constitutes an important informational source for many forecasting methods (Makridakis & Wheelwright, 1978).

Regarding the measurement of willingness-to-pay, the literature has identified two particular biases: the strategic and the hypothetical bias (Breidert et al., 2006). Both are known to affect the validity of the measurement (e.g., Blackburn, Harrison, & Rutström, 1994; e.g., Posavac, 1998). The strategic bias refers to the fact that people are not necessarily willing to reveal their honest reservation prices (Völckner, 2006a). Respondents may misstate their preferences because they think to have an influence on the final pricing decision of the product (McFadden, 1998). This bias may lead to overstatements or understatements. People will understate their willingness-to-pay because they want to lower the prices for market introduction (Bishop & Heberlein, 1979). Alternatively, they may also

3.1 Measurement and Biases of Willingness-to-Pay Measurement

overstate their willingness-to-pay due to the intention of seeing the product being introduced in the market (Green, Jacowitz, Kahneman, & McFadden, 1998). Empirical studies have not yet found solid evidence for strategic behavior in willingness-to-pay studies (Mitchell & Carson, 1990; Völckner, 2006a). Yet, a study of Posavac (1998) for instance proves strategic overbidding in a contingent valuation for a public good, namely improvements in community living areas. In this study, respondents who expected that their college would be responsible for paying the improvements stated a higher willingness-to-pay than respondents who thought to be personally responsible for paying the bills.

The hypothetical bias occurs if willingness-to-pay statements are not backed up with actual purchases (e.g., Ben-Akiva et al., 1994; e.g., Harrison & Rutström, 2002; e.g., Hoffman, Menkhaus, Chakravarti, & Whipple, 1993). This implies that the measurement is based on intentions rather than behavior (Dodge & Hanna, 1997). In contrast to the strategic bias, the hypothetical bias in general has a direction, namely to overestimate the elicited willingness-to-pay, which has been empirically proven in a number of studies (cf. Johannesson et al., 1999). For instance, in a study by Cummings, Harrison and Rutström (1995) the participants were asked in a first step, if they would buy a product for a given price. When they were really offered the product for this price afterwards, only one out of ten respondents really followed their positive buying intention given beforehand. Strictly speaking, the hypothetical bias can, however, only be verified if the same method is applied under the real and the hypothetical setting, in order to eliminate a method bias (Frykblom, 2000; Völckner, 2006a). A study fulfilling this requirement was done by Völckner (2006b) and Lusk and Schroeder (2004), in which measurements in real and hypothetical settings of several methods were compared. The hypothetical results significantly exceeded those of actual transactions. Empirical evidence for the measurement errors resulting from the strategic and hypothetical bias is presented in section 4.1.

3.2 Classification of Measurement Methods

As already mentioned, willingness-to-pay is an unobservable construct and each measurement method can only try to approach a person's true willingness-to-pay as closely as possible (e.g., Wertenbroch & Skiera, 2002). The collective efforts of economics, psychologists and market researchers established several different methods in research, but no one has yet fully convinced in terms of accuracy, practicability and cost efficiency (Breidert et al., 2006; Völckner, 2006a). The existing measurement methods are illustrated (Figure 1) following the classification of Breidert et al. (2006). On the highest level willingness to pay measurements can be grouped in measurements based on stated preference (cf. Louviere, Hensher, & Swait, 2000) or revealed preference (cf. Ben-Akiva et al., 1994). Revealed preferences are simulated or actual price response data, whereas stated preferences are hypothetical survey-based methods.

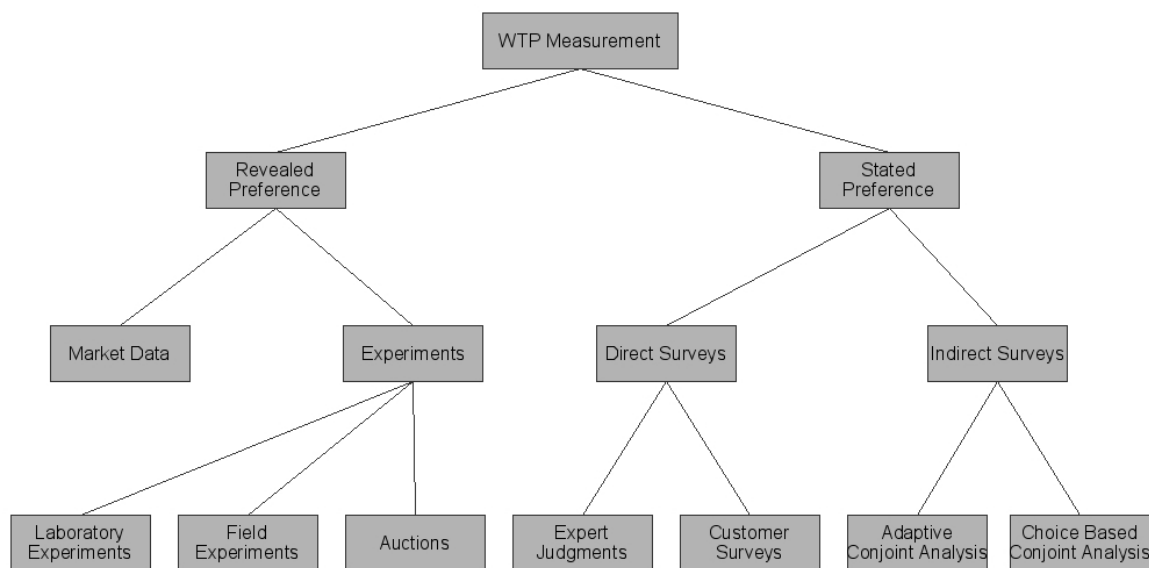


Figure 1: Classification of Measurement Methods (Breidert et al. 2006)

3.2 Classification of Measurement Methods

Revealed preference can be further distinguished in real world market data and experiments. Experiments can take the form of laboratory experiments and field experiments. Market data denote store scanner data or customer panels. Laboratory experiments are basically simulated purchase situations (Silk & Urban, 1978) whereas field experiments take place under real-world shopping conditions. The application of auctions are treated here as a separate category due to their importance for willingness-to-pay measurement. Stated preferences rely on survey techniques, which either directly ask for willingness-to-pay or indirectly infer reservation prices from preference rankings or ratings. The respondents of direct surveys are either consumers themselves or experts, who are supposed to have a high knowledge about customers' behavior (Breidert et al., 2006). Each method shows advantages as well as disadvantages relative to the others (cf. Breidert et al., 2006). However, an important discrimination on the basis of theoretical propositions can be made. Market data, laboratory experiments, field experiments and expert judgments are in general based on aggregated demand data (Völckner, 2006a). Although panel surveys and experiments can be principally used for individual willingness-to-pay measurement, in practice however these methods are evaluated in aggregated form, due to limitations of the individual analysis (Ben-Akiva et al., 1994; Bucklin & Gupta, 1999; Völckner, 2006a) or due to substantial outlays (Nagle & Holden, 1994). The disadvantage of aggregated data is the impossibility of identifying the more profitable segments, as discussed in section 2.1. For the identification of customer segments along the price dimension, it is indispensable for researchers to be able to interpret willingness-to-pay on the individual level (e.g., Balderjahn, 2003; e.g., Völckner, 2006a). Individual levels are especially important if the price-sensitivity is assumed to be heterogeneous (Breidert et al., 2006).

As a result, this study will not consider market data, experiments and expert judgments any further and focus on surveys and auctions. Surveys and auctions offer a measurement of willingness-to-pay on the individual level and in general exhibit a cheaper and less complex way of willingness-to-pay measurements (Völckner, 2006a).

3.3 Revealed Preferences: The BDM lottery

The willingness-to-pay is best predicted by measurements of actual buying behavior, since the hypothetical bias is hereby eliminated. One of the best measurement methods fulfilling this criterion is probably the lottery after Becker, DeGroot and Marshak (1964), hereafter BDM lottery (Wertenbroch & Skiera, 2002; Wang et al., 2007). This auction form was originally designed for the measurement of individual risk awareness, but since the late 1990s it has been increasingly used in the context of willingness-to-pay elicitation (e.g., Bohm, Lindén, & Sonnegård, 1997; e.g., Noussair, Robin, & Ruffieux, 2004; e.g., Rutström, 1998; e.g., Wertenbroch & Skiera, 2002). During the BDM lottery, bids are submitted but the actual price for the product is then determined by a drawn lottery ticket. These lottery tickets are price tags, which cover an interval of estimated willingness-to-pay values for the product. In order to prevent anchoring effects, the distribution of the prices should be kept secret (Wertenbroch & Skiera, 2002). Alternatively, an already set price, which is not known by the respondents, may reduce the problematic definition of the price range for the lottery (Schade & Kunreuther, 2002). After each participant gave his/her bid for the product, the binding price is drawn from the lottery. Each bid above the drawn price forces the bidder to purchase the good at the price determined by the lottery. The participants submitting a lower bid than the drawn ticket are not allowed to purchase the good. In other words, the price the participants are paying is determined by chance and only those participants, whose bids exceed the lottery price, are required and allowed to purchase the product.

What makes the BDM lottery so important is the fact that additionally to eliminating hypothetical bias this mechanism ensures that every bidder has an incentive to state his/her maximum price willing to pay. Methods of that kind are characterized as incentive compatible (e.g., Backhaus & Brzoska, 2004; e.g., Skiera & Revenstorff, 1999). Incentive compatibility means that people's best decision is to truthfully reveal a private information during an experiment (McAfee & McMillan, 1987; Myerson, 1979). Game Theory provides criteria for the formal proof of incentive compatibility. Besides the less rigorous Bayes-Nash equilibrium, the concept of the dominant-strategy equilibrium can be applied

3.3 Revealed Preferences: The BDM lottery

to examine incentive compatibility. A dominant strategy is defined as “the player's strictly best response to any strategies the other players might pick, in the sense that whatever strategies they pick, his payoff is highest” (Rasmusen, 2001, p. 16). To put it differently, there exists a solution for the player to maximize his/her utility irrespectively of the actions of other players. In incentive compatible willingness-to-pay methods, the bidding is so designed that truth-telling is the dominant strategy for each bidder. This can be realized by canceling the influence of a respondent's action on the price of the product (Völckner, 2006a). In terms of willingness-to-pay measurement an incentive compatible method should theoretically lead to respondents' true willingness-to-pay values, because for each bidder the best strategy, the dominant strategy, is to state his/her true willingness-to-pay (Wertenbroch & Skiera, 2002). In sum, the BDM lottery eliminates the hypothetical bias due to the real transactions involved and its incentive compatibility moreover penalizes strategic behavior in the bidding process. Despite this sophisticated approach and the high validity of the BDM measurement method, its application as a measurement method for forecasting is difficult due to practical limitations.

The benefit of backing up measurements with real transactions may well eliminate hypothetical bias, but also adds to costs, timeliness and flexibility. In the BDM lottery products need to be sold to each respondent. Hence, the costs of the BDM lottery depend on the price drawn by the lottery and the amount of people who refuse their purchasing obligation (Völckner, 2006a). The necessity of real transactions also limits the applicability of the BDM lottery for expensive or specialized goods (Wertenbroch & Skiera, 2002). If the subject of a willingness-to-pay experiment was a car, people are likely to have strong concerns buying their new car from a research project. Finding potential car buyers to participate is probably a difficult and time-consuming task. Extra costs for providing confidence and trust like the partnership with a car dealer or the supervision of a notary are needed in order to convince people to buy their new car in a research project (Völckner, 2006a). Furthermore product alternatives are missing, which may reduce the general willingness-to-pay for higher priced goods (Völckner, 2006a). It surely is not a coincidence that in most of the research studies, which feature BDM auctions, fast moving

consumer goods like beverages or sweets are sold (e.g., Rutström, 1998; e.g., Wang et al., 2007; e.g., Wertenbroch & Skiera, 2002). Another practical limitation of the BDM lottery, which is also related to the actual selling of goods, is the application for innovations (Völckner, 2006a). In most cases the new products, which are to be introduced, are only available in a conceptual stage. However, for the BDM lottery the product needs to be fully developed. Especially innovations require early estimations of the willingness-to-pay of the target market due to high risk of introducing new products (Armstrong & Brodie, 1999). The result may then influence the further physical development of the new product. Companies may for instance decide to abandon certain features in order to be able to set lower prices.

3.4 Stated Preferences: Surveys

Customer surveys ask the consumer directly for his/her willingness-to-pay of a specific product or service. This method is commonly used for public or non-marketed goods (e.g., Gregory, Lichtenstein, & Slovic, 1993). In this context, it is better known as contingent valuation method (e.g., Mitchell & Carson, 1990). An alternative notation is the direct price elicitation method (Backhaus, Wilken, Voeth, & Sichtmann, 2005). Stoetzel (1954) was among the first to use this approach and asked the consumer about his/her personal minimum and maximum price threshold, in which he would buy the product. The lower threshold aims at the price level consumers are not willing to undercut due to quality skepticism. Many refinements of the direct survey have been used in research in the last decades. In general two approaches can be identified (Völckner, 2006a). In the open-ended approach, the respondents are directly asked to state their willingness-to-pay (e.g., Kalish & Nelson, 1991). In the closed-ended, also known as dichotomous choice approach, the respondents receive one or several subsequent offers with one single product but differing prices, which they either can accept or reject (e.g., Cummings et al., 1995). The direct price elicitation is used by market research companies; A.C. Nielsen's BASES Price Advisor tool, for instance, represents a special form of a direct survey, in which several product profiles are evaluated by the respondents (Völckner, 2006a). Addi-

3.4 Stated Preferences: Surveys

tionally, GfK uses direct price elicitation for an assessment of critical price ranges (Breidert et al., 2006). The Price Sensitivity Measurement of Research International is based as well on the contingent valuation approach (Völckner, 2006a).

The direct survey as a method for willingness-to-pay elicitation evidently suffers from several limitations concerning its validity, which have already been partly brought up. First, the setting is hypothetical. Second, the direct questioning on the price overemphasizes the importance of the price cue relative to other product attributes (Simon, 1992). Third, the respondent has no incentive to reveal his/her true willingness-to-pay. As a consequence, the possibility of strategic behavior may bias the stated willingness-to-pay (Dodge & Hanna, 1997; Nagle & Holden, 1994).

Rather than asking consumers about their willingness-to-pay directly and thus possibly overemphasizing the importance of price, researchers were looking for a more realistic and unobtrusive solution. The most prominent form of such indirect surveys is the conjoint analysis, which measures consumers' preference structures rather than willingness-to-pay values (Backhaus & Brzoska, 2004; Green & Srinivasan, 1990). The respondents receive whole product profiles, which contain systematically varied attributes and prices. The respondents rank, rate or select these product offers according to their personal preference. In principle, the conjoint analysis tries to derive the utility contribution of single attributes from empirical preference judgments, e.g., the price (Backhaus, Erichson, Plinke, & Weiber, 2006). Pricing studies have become a major field of application for the conjoint analysis (Wittink & Cattin, 1989; Wittink, Vriens, & Burhenne, 1994). Since the introduction of “the classic conjoint analysis” in the marketing research field (Green & Rao, 1971), different variations have evolved (e.g., Johnson, 1987; e.g., Louviere & Woodworth, 1983).

In direct comparison, the conjoint analysis should theoretically outperform the contingent valuation method in terms of validity (Völckner, 2006a). Still, there are also theoretical disadvantages, in particular for including the price of the product as an additional product

attribute. If the price is part of the offer, the price range of the presented offers is crucial for the willingness-to-pay elicitation. Usually the price range is set to cover the most usual market prices. A respondent's willingness-to-pay which substantially exceeds or goes well below the market price level, cannot be adequately measured (Breidert et al., 2006). Furthermore, the price range cannot be simply extended. The range of an attribute affects the respondent's perceived importance of that attribute. To put it differently, increasing the range increases the perceived importance as well (Verlegh, Schifferstein, & Wittink, 2002). This phenomenon is known as range effect in psychophysics (e.g., Parducci, 1974). Similarly, the number of levels of a certain attribute has an impact on the attribute's perceived importance (Steenkamp & Wittink, 1994). The so-called number-of-levels effect is higher than the range-effect (Verlegh et al., 2002). This means that researchers can not raise accuracy in implementing more price points, without artificially increasing the focus on price. In this regard, a third potential source for biased results needs to be stressed, which is known as the price effect (Breidert et al., 2006). If the total number of attributes is increased the importance of the single attribute, e.g., the price, decreases (Williams & Kilroy, 2000). In general, the validity of the conjoint analysis is dependent on a critical examination of these effects and a well thought-out study design for each survey. "The price effect, the range effect and the number-of-levels effect cannot be avoided for price, when it is included as an attribute in a conjoint study" (Breidert et al., 2006, p. 25). In essence, these theoretical concerns put the theoretical superiority of the conjoint analysis in perspective.

3.5 Discussion of Measurement Methods

Due to the discussed practical limitations of revealed preferences in the context of willingness-to-pay measurement, this study prefers measurement methods, which are not dependent on real transactions, but rely on stated preferences. The survey-based measurement seems more appropriate for the demands of costly and flexible willingness-to-pay forecasts. "Of particular importance is the flexibility of hypothetical methods" (Mitchell & Carson, 1990, p. 87). Hypothetical measurements, although being less accurate, can be

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conducted faster, more flexible and cheaper than revealed preference methods. Although the accuracy of the BDM lottery still must be denoted as superior, hypothetical methods enable marketers to conduct several different measurements at low costs.

Nevertheless, the BDM lottery has been used quite successfully for willingness-to-pay elicitation (Wertenbroch & Skiera, 2002). It offers a maximum of validity and approaches the true willingness-to-pay the closest (Wertenbroch & Skiera, 2002). Wang et al. (2007, p. 203) even “believe that the BDM approach is the ‘best’ method.” The BDM lottery is understood as representing the state-of-the-art accuracy level of willingness-to-pay measurement and an excellent benchmark for the validity of hypothetical measurement methods. Hence, this study will use the BDM mechanism in order to provide the willingness-to-pay behavior aimed to be predicted.

Concerning the comparison of the conjoint analysis and the contingent valuation, the empirical literature could not find clear validity differences. One of the first studies which empirically compares different methods for willingness-to-pay elicitation according to validity, was done by Kalish and Nelson (1991). The study on airline tickets tested for external validity by predicting hold out samples on the basis of the conjoint analysis as well as the direct price elicitation. After completion of the surveys, the airline tickets were sold to the respondents. As a result, the conjoint based approaches outperformed the direct price elicitation. 62% of the demand were correctly predicted by both conjoint analyses, whereas the contingent valuation predicted only 46% correctly. The calculated price response functions were, however, more plausible in the case of the contingent valuation.

Interestingly, the study of Völckner (2006b), in which prepaid telephone cards were sold, could not find any significant difference between the direct price elicitation and the conjoint analysis. “The changing signs of differences between these two methods indicate that there is no clear evidence on which method results in higher willingness-to-pay” (Völckner, 2006b, p. 143). Regarding this study, it is worth noting that the same study had already been published by Sattler and Nitschke (2003). The results of the study of Sattler

and Nitschke (2003) were validated by a partial replication study of (Backhaus, Voeth, Sichtmann, & Wilken, 2005). The study design of Sattler and Nitschke (2003) hereby was maintained as closely as possible except for a smaller sample size and four city trips as the study's subjects. Also only the contingent valuation and the conjoint analysis were compared. The replication revealed contradictory findings respective the high performance of the contingent valuation method. In the replication study, the conjoint analysis approximates real purchase more closely in the hypothetical situation. The authors indicated the higher involvement and the higher complexity of the product offerings as an explanation for the contradictory results.

In essence, the superiority of the conjoint analysis over the contingent valuation has not yet been empirically proven (Backhaus & Brzoska, 2004; Völckner, 2006a). In contrast, the contingent valuation holds advantages with regard to the discussed criteria concerning forecasts of willingness-to-pay. Additional to time and cost benefits in data collection and analysis, also the high flexibility is a reason for its attractiveness as willingness-to-pay measurement method (Diller, 2000). During the conjoint analysis many different product portfolios need to be elaborated and presented adding to time, cost and flexibility. The study of Völckner (2006b) featured respondents' ratings of the generally perceived complexity. Not surprisingly, the direct price elicitation was rated the least complex.

An advantage of the conjoint analysis worth mentioning is its better applicability to elicit willingness-to-pay for innovations, because it is generally easier for respondents to value single product components and features (Völckner, 2006a). Nevertheless, the contingent valuation is the most flexible form of hypothetically measuring willingness-to-pay and thus represents a suitable forecasting technique. "Within the important constraint that the scenario must have plausibility for the respondent, the contingent valuation researcher can easily specify a variety of states of the good to be valued and the conditions of its provision" (Mitchell & Carson, 1990, p. 87). Hence, a central benefit of the contingent valuation is the possibility to elicit willingness-to-pay in specific contexts. "Willingness-to-pay is a situation-specific, individual level construct. It should be regarded as a function of the

3.5 Discussion of Measurement Methods

perceived value of a good in the specific value elicitation situation” (Völckner, 2006b, p. 148). Thus, marketers are interested in how consumers' willingness-to-pay changes under marketing mix conditions. The realization of willingness-to-pay studies in specific contexts may not only increase the perceived reality but also provide important insights in situational differences.

In this regard Wertenbroch and Skiera (2002) emphasize the possibility to include the *point of purchase* as a major advantage for willingness-to-pay elicitation methods. This implies that market research is enabled to carry out transactions “at real points of purchase under the marketing-mix conditions the marketer desires” (Wertenbroch & Skiera, 2002, p. 230). A study result of Thaler (1985) illustrates the importance of situational contexts for willingness-to-pay elicitation. In this study respondents were confronted with the following situation. They should imagine to be lying on a beach and a friend would call and ask if he shall bring them a can of their favorite brand of beer, either from a fancy resort hotel or a small run-down grocery store. They were supposed to tell this friend the maximum amount willing to pay for the beer and he would only buy it if the price was below this amount. The two situations were kept constant except for the point of sale. In the fancy resort hotel example, the respondents' median for willingness-to-pay was \$ 2.65, whereas in the grocery store situation the median denoted only \$ 1.50. Although the can of beer and the place of consumption were the same and respondents did have an incentive in answering truthfully their true willingness-to-pay differed for the two points of purchase.

Given the advantages concerning flexibility, costs and timeliness, the contingent valuation is seen as the best suited method for hypothetical willingness-to-pay measurements for the purpose of this study. This decision leads to the question which type of questioning should be used: open-ended or closed-ended questions. The closed-ended approach better simulates an actual buying decision more closely (Mitchell & Carson, 1990). Similarly, Li and Mattsson (1995, p. 267) state that the discrete choice contingent valuation is “more market like and easier for the respondent.” Despite of this advantage, the closed-ended approach is supposed to reduce the necessary concentration on the revelation of the true

willingness-to-pay and lead to inaccurate results (Mitchell & Carson, 1990). An important limitation of the closed-ended approach is the so-called starting-point bias, which means that the provided prices affect respondents' willingness-to-pay (Herriges & Shogren, 1996; Frykblom & Shogren, 2000). This bias is related to the general anchoring phenomenon, which is very robust and empirically well established (cf. Chapman & Johnson, 2002; cf. Tversky & Kahneman, 1974). This implies that even if a provided solution is obviously unrealistic and false, it affects the respondent's own answer (e.g., Green et al., 1998; e.g., Simonson & Drolet, 2004).

In essence, the open-ended elicitation format is seen as offering a less subjective and easier alternative to closed-ended questions and is therefore selected for eliciting individual willingness-to-pay values for the forecast. In the forecasting literature, this approach can be classified as intention-based forecast (Armstrong, 2001). One important principle concerning forecasting with intentions is stated by Morwitz (2001, p. 34): “do not accept intentions data at face value; rather, adjust intentions to remove biases.” This is necessary because people do not necessarily act in accordance with their intentions (Morwitz, 2001). The next chapter shows why this statement holds and how such an adjustment of willingness-to-pay intentions can be achieved.

4 Calibration of Direct Price Elicitation

4.1 Measurement Errors in the Contingent Valuation

The direct comparison of measurements of the contingent valuation and the BDM displays the discrepancy in validity between both methods that needs to be corrected. For instance, Schreier and Werfer (2007) empirically compared the validity of the BDM lottery and the contingent valuation among other methods. The direct price elicitation significantly overstated the willingness-to-pay in comparison to the values of the BDM lottery. The willingness-to-pay for the same iPod in the contingent valuation was almost twice as high as in the BDM (CV: $M = € 164$, $SD = 105$; BDM: $M = € 73$, $SD = 59$). Additionally, the face validity of the contingent valuation was found significantly lower as the willingness-to-

4.1 Measurement Errors in the Contingent Valuation

pay correlated less with the interest in the product. The price response functions of the tested methods exhibited a high fit ($R^2 > 0.97$) and the elasticities of all methods displayed plausible ranges. As a consequence, the direct price elicitation and the BDM lottery were considered to offer a satisfactory level of internal validity.

The studies of Wertenbroch and Skiera (2002) further shows the superior validity of the BDM lottery compared to the direct price elicitation. The mean difference between the BDM and the contingent valuation were 20% for a can of Coke (CV: $M = \text{DM } 1.35$, $SD = .81$; BDM: $M = \text{DM } 1.06$, $SD = .66$) and 33% for a piece of cake (CV: $M = \text{DM } 1.68$, $SD = .82$; BDM: $M = \text{DM } 1.12$, $SD = .56$). Respondents overstated their willingness-to-pay in the direct, hypothetical questioning compared to the incentive compatible BDM lottery. The correlations between the liking, the current demand and the willingness-to-pay were also higher for the BDM lottery and show a higher face validity. Concerning internal validity, the BDM lottery featured a better fit to the predicted price response function than the contingent valuation. Regarding external validity, only 1 out of 41 respondents and 3 out of 40 respondents refused to follow the purchase obligation in the Coke and the cake study. Nevertheless, the satisfaction with the purchase was relatively high for both studies. Wertenbroch and Skiera (2002) assign high external validity to the BDM mechanism.

Additional to the already discussed literature, these empirical studies prove an overestimation by the contingent valuation and demonstrate the need for a correction of this measurement error. The size of the error is definitely too large for meaningful forecasts. In particular, two concrete benefits of the BDM over the contingent valuation have been identified: the reduction of strategic bias and the elimination of the hypothetical bias. These biases need to be worked on in order to achieve improvements in the measurement of the contingent valuation.

Little is known today about the exact consequences and size of strategic behavior in the measurement of willingness-to-pay elicitation (Völckner, 2006a). The practical effectiveness of incentive compatibility in the revelation of truthful statements has been chal-

lenged. Incentive compatibility does not necessarily mean that strategic bias can be totally eliminated. An incentive for a truthful revelation does not necessarily imply that the respondent will recognize the optimal strategy or follow this strategy (Wertenbroch & Skiera, 2002; Kaas & Ruprecht, 2006). The term empirical or behavioral incentive compatibility was used for a differentiation between theoretical and practical implications (e.g., Kaas & Ruprecht, 2006). Völckner (2006b, p. 143) similarly states that “a rational decision-maker might be a rare exception under practical circumstances.” Signs for the partly ineffectiveness of incentive compatibility exist in the literature. In the study of Schreier and Werfer (2007), 23% of the respondents failed to answer a control question for the BDM lottery despite the high effort in explaining the mechanism. In contrast, Wertenbroch and Skiera (2002) noted that their respondents well understood the procedure and were satisfied with the outcome. However, no control questions have been posed in this particular study.

Schreier and Werfer (2007) moreover provide evidence for strategic bidding behavior within BDM lotteries. Interestingly, some respondents speculated on a particularly favorable price or intentionally gave very low bids so that they had no chance of winning. The dominant strategy was obviously ignored by some participants. Another critical assessment of incentive compatibility comes from Kaas and Rurecht (2006). In their study, they examined the theoretical superiority of incentive compatible methods in practice. One of the major findings is that 22% of the respondents in the BDM are classified as underbidders, people who lost in the lottery but rated the actual purchase price a good deal. In contrast, 9% of the participants in the BDM were considered as overbidders. The authors explain the limited success of incentive-compatible methods in actual studies with consumers' uncertainty of their own willingness-to-pay.

In sum, the theoretical superiority of incentive compatibility could not be clearly shown in practice. The fact that the effects of the strategic bias and its correction in the form of incentive compatibility is disputed, makes its practical consideration within hypothetical measurements difficult. But the case is different for the well documented hypothetical

bias. The reduction of the hypothetical bias in measurements of the contingent valuation seems a more promising area for improvements. The need for hypothetical forecasting makes the elimination of hypothetical bias a central objective (Posavac, 2001). Therefore the correction of the hypothetical bias represents the focus of this study.

4.2 Calibration of Hypothetical Measurements

In the literature, several methodological attempts towards the reduction of hypothetical bias exist. One approach was presented by Völckner (2006b), who sold the product of her survey to only a fraction of the respondents. 10% of the respondents were selected randomly to buy the product at their own previously stated willingness-to-pay. This procedure could in fact reduce the hypothetical bias, as no significant differences between the 10% and the 100% condition have been found in almost all cases (Völckner, 2006b). Further research is needed in order to verify the results of this study. However, even if this method effectively reduces the hypothetical bias, it does not fully eliminate the disadvantages linked to real transactions between the researcher and the respondent and is therefore not seen as a sufficient solution.

Harrison and Rutström (2002) identified two categories of approaches for the elimination of hypothetical bias: *instrument calibration* and *statistical calibration*. In the *instrument calibration* the hypothetical bias is tried to be eliminated by improving the wording of the questionnaire. An interesting proposition in this regard comes from Cummings and Taylor (1999), in which the respondents are explicitly informed and warned about the hypothetical bias, the so-called *cheap-talk design*. List (2001, p. 1504) showed that the warning about the hypothetical bias can “mitigate hypothetical bias for certain consumer types” but not fully eliminate it, especially for respondents with experience in the market. A further application of the cheap talk design by Blumenschein et al. (2008) revealed no overall reduction of the hypothetical bias. On the contrary, *statistical calibration* refers to eliminating hypothetical bias via a statistical bias function (Blackburn et al., 1994), for which the size of the bias needs to be known. For illustration, Blackburn et al. (1994) provide an analogy with a watch that runs 10 minutes late. The error of the delay can be easily elimi-

nated because its size is known. The problem in the case of willingness-to-pay is the unknown size of the error. The calibration function should be general and transferable to different products, samples and contexts (Cummings & Taylor, 1999; Fox, Shogren, Hayes, & Kliebenstein, 1998). In the literature, however, constantly different sizes of hypothetical bias are found. Harrison and Rutström (2002) present an overview, in which the hypothetical bias ranges from understatements to overstatements of over 400 percent.

Nevertheless Blackburn et al. (1994) presented encouraging results for the possibility of calibrating the hypothetical bias on the basis of socio-economic characteristics of a sample. A semiparametric model exactly predicted that “11% of the chocolate sample would say yes to the real question given that they had already said yes to the hypothetical question” (Blackburn et al., 1994, p. 1087). However, the sample size of this study was relatively small and it was lacking a theoretical reasoning, on which the calibration would occur and why socio-economic variables were used.

The most successful approach to calibrate hypothetical statements was probably done with certainty statements. This approach asks respondents to state how certain they are about their willingness-to-pay judgment in a follow-up question. This information was subsequently used to calibrate the elicited willingness-to-pay based on the assumption that higher certainty leads to more realistic results. Only answers of very certain participants were treated as valid estimations of willingness-to-pay. Two different types regarding the measurement of certainty can be differentiated. Either the degree of uncertainty on a 1-10 scale from very uncertain to very certain is used or only two states of uncertainty are distinguished: *probably sure* or *definitely sure* (Blumenschein et al., 2008).

Champ, Bishop, Brown and McCollum (1997) measured the respondents' certainty on a 10-point scale and found that the percentage of hypothetical donations of respondents, who stated to be very certain with their response, featured no difference to the percentage of real donations for an environmental good. In contrast, Johannesson, Liljas and Johansson (1998) and Blumenschein, Johansson, Blomquist, Liljas and O'Connor

4.2 Calibration of Hypothetical Measurements

(1998) measured certainty using the dichotomous options. The study of Johannesson et al. (1998) found that the number of people, who indicated to be *absolutely sure* about their intention to buy the box of chocolates for the set price was lower than the number of people who actually bought it in the real setting. In the study of Blumenschein et al. (1998) an improved formulation of the two certainty options resulted in an effective approach to eliminate hypothetical bias in the form of no significant difference between calibrated hypothetical and real statements. A further encouraging and very recent result is provided by Blumenschein et al. (2008). The percentage of people willing to buy an offered diabetes management system was twice as high in the contingent valuation (45%) compared to the real purchase setting (26%). The percentage of subjects being *definitely sure* was very close to the percentage of real purchases (24% versus 26%). The difference between the number of real purchases and the number of the certain purchase-intentions was found to be statistically insignificant. The authors conclude that “the follow up certainty approach is effective in removing the hypothetical bias” (Blumenschein et al., 2008, p. 123).

Despite these successful results to calibrate hypothetical purchase intentions with certainty statements, the demand for an effective calibration method for the contingent valuation still prevails as some limitations and remarks to the presented studies need to be stressed. First of all, the majority of the studies featuring certainty as calibration method originate from the research on public goods. The possibility of a difference of the results between private and public goods should be considered (Johannesson et al., 1999). Nevertheless it may be worth to point out that the studies of Blumenschein et al. (1998) and Johannesson et al. (1998) were based on private goods, i.e. diabetes management program and a box of chocolates respectively. Furthermore, the applied definition of the term willingness-to-pay is different to the one used in the present study, since the calibration of the discussed studies did not address exact monetary willingness-to-pay values. The calibration of hypothetical statements was rather based on the percentage of purchases versus non-purchases and is probably better seen as covering willingness-to-buy statements. This means that people were confronted with a specific price for the product and chose either to buy or

not-to-buy. The calibration covered mere proportions of buyers and non-buyers rather than respondents' willingness-to-pay values. Still, several different price points could be provided in order to derive a demand function (e.g., Blumenschein et al., 2008). Additional to the previously discussed limitations of the dichotomous choice contingent valuation, i. e. the previously mentioned starting point bias and the difficult choice of price points, this measurement procedure limits the analysis with regard to the segmentation of the market, if concrete willingness-to-pay of each respondent is not assessed by subsequent questions. The results of the presented studies in any case fail to provide the previously mentioned importance of willingness-to-pay measurement on the individual level because of this design.

Nevertheless the successfully verified method of using respondent's certainty for the calibration of their hypothetical statements represents a valuable finding and a promising starting point for further approaches and refinements. At the moment, only little background on the theoretical propositions of consumers' certainty has been discussed. Blumenschein et al. (2008, p. 130) propose that the high certainty state better resembles the "response necessary to make a purchase in real market situations." The choice of buying or not buying in the contingent valuation is a decision, which must be made immediately. Only consumers, who are absolutely sure to buy a specific product are prepared to take out their wallet and put their money on the counter, whereas uncertain consumers are more likely to hesitate.

Further explanations for the theoretical linkage between certainty and the accuracy of willingness-to-pay can be found in social psychology. The attitude-behavior framework has been applied to the willingness-to-pay statements of the contingent valuation (Blumenschein et al., 2008; Mitchell & Carson, 1990). Sample and Warland (1973) examined response uncertainty with regard to the prediction of behavior. This study investigated students' attitude towards student government and their voting behavior in an undergraduate student election. The results suggest that under high-certainty, attitude is a main predictor of both intention and behavior (Sample & Warland, 1973). The correlation

4.2 Calibration of Hypothetical Measurements

between attitude and the reported behavior denoted $r = .06$ for the low certainty group, whereas $r = .47$ for the high certainty group. Furthermore, Fazio and Zanna (1978a) as well as Raden (1985) verify the moderating role of certainty in attitude predicting behavior intentions and in consequence behavior. The attitude behavior correlations increased with the level of certainty, from .08 to .40 for the low uncertainty and high uncertainty group respectively. Fazio and Zanna (1978b) showed as well that respondents, who had a high confidence in a certain attitude, showed a significantly higher consistency between attitude and behavior than respondents with low confidence.

Aside from Ajzen and Driver (1992), Fujii and Gärling (2003) interpret stated preferences as behavioral intention and emphasize the increased ability of behavioral intention to predict behavior as it reflects a commitment to act and not only a desire to act. In the empirical part Japanese commuters were asked whether they would use the new built underground line with the following options: *Yes*, *Yes to some degree* or *No*. These options were included in order to reveal the degree of the behavioral intention for using the new public transportation line. This information successfully increased the match between intention and behavior of the before- and after-panel survey. In sum, these results suggest that the certainty of a stated behavioral intention can be interpreted as an indicator of how strongly individuals intend to perform a certain behavior. “Intention strength is a factor that increases the likelihood that an intention will be implemented” (Fujii & Gärling, 2003, p. 393). According to the theory of planned behavior, “it is found that when behaviors pose no serious problems of control, they can be predicted from intentions with considerable accuracy” (Ajzen, 1991, p. 186).

Given the presented empirical results and theoretical foundation of the importance of the individual certainty level for the predictability of hypothetical willingness-to-pay statements, this study tries to extend this approach in order to calibrate individual willingness-to-pay values elicited by the contingent valuation. For this purpose, the question arises how uncertainty is best measured. The dichotomous choice options used by Blumenschein et al. (2008) are inappropriate for the calibration of monetary willingness-to-pay values,

rather a more differentiated assessment of a consumers' certainty is needed. Likewise the second approach of using a scale for the uncertainty measurement (Champ et al., 1997) appears too subjective to allow for a precise interpersonal comparability. Respondents are likely to have similar perceptions of being absolutely certain or totally uncertain, but rating the personal certainty level on a 10-point scale seems too subjective. In addition, Blomquist, Blumenschein and Johannesson (2008) show that hypothetical statements of only the high end of the certainty scale correspond to real willingness-to-pay statements. For the identification of a new way of measuring consumers' uncertainty objectively, a better understanding of the processes in consumers' minds when forming willingness-to-pay judgments is needed. Thus, the sources and reasons for individual consumers' uncertainty are attempted to be identified and consequently used to achieve objective and easily measurable calibration criteria.

4.3 Consumer Characteristics and Uncertainty in Willingness-to-Pay

In general, the central assumption of all current measurement methods is that consumers know with certainty their willingness-to-pay for a product (Hanemann, 1984; Heiner, 1985; Wang et al., 2007). It is astonishing that the assumption of respondent's ability to derive their willingness-to-pay with certainty is still applied (DuBourg, Jones-Lee, & Loomes, 1997), despite the fact that references to the respondent's difficulty in the elicitation of their willingness-to-pay can be found in the literature. A frequently cited study regarding the cognitive difficulties in willingness-to-pay elicitation comes from Brown et al. (1996). Although this argumentation should demonstrate the superiority of the dichotomous choice approach, it may be extended to other open-ended measurement methods as well (Kaas & Ruprecht, 2006). The cognitive difficulty for the respondents may be a reason why some people state a willingness-to-pay of zero while others provide relative high figures in the open ended contingent method (e.g., Boyle, Johnson, McCollum, & Desvousges, 1996). Gregory et al. (1993) conclude that respondents did not have precise monetary representations of their values for concrete environmental projects. As already noted, Völckner (2006a) questions the assumption of rational decision-making in the context of incentive compatible methods. Kaas and Ruprecht (2006) indicate that respon-

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dents are unfamiliar with the situation of formulating their preferences in the form of willingness-to-pay. Likewise, respondents are in general not aware of their preferences and thus these may be unstable over time (Bettman, Luce, & Payne, 1998). On the basis of these formulations, Kaas and Ruprecht (2006) establish a modified bidding model under uncertainty and show that the risk-averse bidder has a tendency to underestimate.

In combination with the presented results of successfully calibrating hypothetical methods, the theoretical considerations give reason to assume that some consumers are more certain than others concerning their willingness-to-pay for a specific product. The specific characteristics of the consumers which lead to uncertain responses are of particular importance for this study's objective. Indications for the importance of individual consumer characteristics can be found in the literature. Sichtmann and Stingel (2007) differentiated the willingness-to-pay elicitation of a conjoint analysis and an incentive compatible auction between a low and high involvement state. Via online interviews, they sold regular telephone minutes, representing low involvement condition, and UMTS contracts as high involvement products, as the UMTS technology just entered the market at that time. The conjoint analysis showed higher willingness-to-pay values than the auction. In contrast, the conjoint analysis tends to underestimate willingness-to-pay in low involvement situations. Thus, the respondent's level of involvement is likely to moderate the willingness-to-pay measurement among different methods.

The study of List (2001) applies Cummings and Taylor's (1999) approach of a "Cheap Talk design" and revealed that its effect depends on the market experience of respondents. The dealers of sportscards were "immune" to the warnings about hypothetical bias, in contrast to the group of nondealers. Furthermore, studies exist which address the importance of consumer demographics on willingness-to-pay measurements. Tscheuling and Blaimont (1993) reveal a significant influence of education levels and profession on the validity of the conjoint analysis and conclude that the results of conjoint analysis are highly dependent on the composition of the sample. However, Sattler, Hensel-Börner and Krüger (2001) present contradicting results and find no significant influences of consumer

demographics on preference measures for coffee, refrigerators and bus journeys in a study with over 700 respondents. Nape, Frykblom, Harrison and Lesley (2003) provide results of significant influences of the consumer demographics personal income, race and age on willingness-to-accept, although this study must be considered as an exploratory study without formulated hypotheses and explanations of their results.

Wang et al. (2007) use a consumer's uncertainty with willingness-to-pay estimates as central starting point for their new measurement approach ICERANGE where willingness-to-pay is defined as a range rather than a single point. In their theoretical elaboration, they differentiate consumers' uncertainty in *product performance/quality uncertainty* and *consumers' preference uncertainty*. Urbany, Dickson and Wilkie (1989, p. 208) made an equivalent differentiation regarding a consumer's uncertainty via factor analysis: "uncertainty regarding what is known about the alternatives (*knowledge uncertainty*) and uncertainty regarding which alternative to choose (*choice uncertainty*).” Furthermore, they found that choice uncertainty and knowledge uncertainty are strongly related. Approximately 70% of the respondents were classified as either low in both categories or high in both categories.

This differentiation of consumers' uncertainty in the decision making process (Urbany et al., 1989) and its relevance for willingness-to-pay measurements (Wang et al., 2007) is used as a starting point for the following in-depth analysis. In purchase situations, knowledge uncertainty refers to a consumer's inability to evaluate a product's quality and future performance (Urbany et al., 1989). In order to determine the personal willingness-to-pay, the consumer has to assess product quality. The previously stated definition of willingness-to-pay as a direct monetary measure of product value (Kalish & Nelson, 1991) illustrates the critical relationship between the consumers' evaluation of a product and the resulting willingness-to-pay. The inadequate assessment of a product's quality can be characterized as a problem of missing information (Rao & Sieben, 1992). The consumer needs to exert a higher effort in processing the available information and inferring the missing information (Shugan, 1980). The consumer, however, is not a perfect rational individual

with perfect information processing but owns only limited processing capability (Simon, 1955). It is not possible for a consumer to know whether he or she will be satisfied with a car before the purchase. There are too many attributes, technical specifications and hidden error sources to form a complete picture of the car's product quality. Hence, respondents can not assess a product's quality with certainty but can only estimate although some consumers can evaluate quality better than others. Involvement and product knowledge are seen as important personal factors in this respect.

4.4 Product Involvement

The involvement construct is broadly defined as “a person's perceived relevance of the object based on inherent needs, values, and interests” (Zaichkowsky, 1985, p. 342) The level of involvement in a purchase situation reflects the interest towards a specific product category and the perceived importance of making the right decision. Three different sources of involvement have been identified. Involvement can be either personal, physical or situational. Personal involvement is related to inherent needs and values. A gourmet is, for instance, generally more concerned about the quality of the restaurant's food than an average guest. Physical involvement results from characteristics of the object, which leads to a differentiation and increase of interest. The probability of reading a received handwritten letter rather than an e-mail is, for instance, likely to be higher. Finally situational involvement applies to a temporarily increased relevance or interest in an object. The personal importance of choosing a particularly nice present for your partner's birthday is probably higher than a present for your grandfather's birthday (Bloch & Richins, 1983; Houston & Rothschild, 1978; Zaichkowsky, 1985).

Another differentiation is found by Park and Young (1986), involvement has two dimensions: cognitive and affective. The cognitive involvement represents the personal relevance of message contents concerning a brand's functional performance while affective involvement means the personal relevance of a message based on emotional or aesthetic consequences to one's self-image towards the outside world. Whether the involvement is affective or cognitive depends on the interaction of the stimulus and the respondent

(Zaichkowsky, 1994). From these examples it can be seen that involvement is a very broad concept finding application in advertising and purchase situations. But it has also been identified as a key construct in the decision making process (Burnkrant & Sawyer, 1983; Gensch & Javalgi, 1987; Greenwald & Leavitt, 1984).

In principle, the level of involvement indicates how important a problem is to an individual and influences how much search effort is put into arriving at a decision. Involvement's motivation on search effort and processing has been well established in the literature (Laurent & Kapferer, 1985; Seiders, Voss, Grewal, & Godfrey, 2005; Bloch, Sherrell, & Ridgway, 1986). Highly involved consumers in contrast to low involved consumers are actively seeking information, compare the product attributes more thoroughly and differentiate better between different brands (Zaichkowsky, 1985). Furthermore, Engel, Blackwell and Miniard (1995, p. 161) define involvement as a major condition for “extended problem solving behavior”.

More specifically, Celsi and Olson (1988) investigated the differences of consumers' attention and comprehension processes after manipulating their situational and enduring levels of involvement. “In sum, greater levels of felt involvement should affect the amount of effort, the focus of attention and comprehension processes, and the number and type of meanings produced by comprehension processes” (Celsi & Olson, 1988, p. 213). Highly involved consumers are motivated to attend longer as well as comprehend more information in a buying situation.

Chaiken (1980) showed that the level of involvement does not simply affect the motivation to process information, moreover she classified two different strategies how to deal with information based on different levels of involvement. Chaiken (1980) contrasts a systematic with an heuristic information processing strategy depending on the level of involvement. “In essence, a systematic view of persuasion emphasizes detailed processing of message content and the role of message based cognitions in mediating opinion change,

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whereas a heuristic view de-emphasizes detailed information processing and focuses on the role of simple rules or cognitive heuristics in mediating persuasion” (Chaiken, 1980, p. 752).

The advantage of a heuristic information processing strategy is the minimized cognitive effort used and thereby making a decision faster and more convenient. However, the drawbacks are obviously the limited reliability of the resulting decision. Respondents will prefer a systematic strategy when the benefits for a reliable decision outweigh the efforts in analyzing and processing the information, in short, when respondents perceive a decision as important. Respondents using the systematic strategy derive their evaluations from message characteristics, e.g., plausibility of argumentation, whereas the heuristic strategy is based on source characteristics, e.g., trustfulness in information source (Chaiken, 1980). Hence, the highly involved consumer is a critical information processor, while low involved consumers try to use shortcuts in decision making. People with low involvement likely rely on a friend's advice, on high-quality retailers or on other indicators of product quality seen as trustworthy. An application of Chaiken's (1980) theory to the field of willingness-to-pay measurement can be found in a study by Ajzen and Driver (1992, p. 299); “In the absence of the required motivation or ability, judgments tend to proceed in a peripheral mode, relying on situational cues or other nonsubstantive considerations.”

The study of Mitra (1995) empirically confirmed and expanded these results. In the study, the respondents were confronted with two different types of offers. In the congruent settings the price and the attributes were both either positively or negatively formulated. In the incongruent condition, the offers featured inconsistencies between price and attributes, i. e. the price was presented as low (high) and the attributes as strong (weak). The higher effort in product evaluation was shown to be significantly higher in the increased motivation setting. Under low motivation only price-based inferences influenced the evaluation in both conditions. On the contrary, under high-motivation a different behavior was revealed. Attribute-based inferences prevailed in the incongruent situation whereas both price- and attribute-based inferences were used in the congruent condition.

In other words, the degree of motivation determines which type of product information is used and how extensive the evaluation turns out to be. Whereas low motivated consumers could not distinguish the advantageous offers from the unfavorable ones, the highly motivated sample could indeed differentiate by processing attributes and price information.

In essence, involved consumers have been found to use more criteria in their decision making (Zaichkowsky, 1985, 1988), search for more information (Celsi & Olson, 1988; Laurent & Kapferer, 1985) and process relevant information more thoroughly (Chaiken, 1980; Mishra, Umesh, & Stem, 1993). Additionally involvement should also lead to an increased interest in the study, which should also positively affect the quality of the results (Wittink & Bergestuen, 2001). The increased attention and comprehension will enhance a consumer's ability to evaluate a product. Especially in the cognitively demanding situation of deriving the personal willingness-to-pay for a product, the level of involvement can be considered to play a decisive role. Due to the increased information processing, products can be evaluated more effectively and more reliably. Hence, the involved consumer is supposed to determine a product's performance with higher certainty. A consumer's reduced uncertainty should lead to better predictions on the basis of hypothetical statements. This theory is moreover supported by Mishra et al. (1993, pp. 340-341): "as the respondents become more involved with the choice task, they process the information better and are more consistent in their decision making." This consistency of involved consumers should positively affect the two elicitation formats of hypothetical (e.g., CV) and real contexts (e.g., BDM). On the basis of these findings and in accordance with Chandrashekar (2001, p. 87), who identified "the need for disaggregate analyses of consumers' choice" for the state of involvement, product involvement is supposed to moderate consumers' hypothetical elicitation of willingness-to-pay. Consequently, the following hypothesis is formulated:

H_1 – Highly involved individuals provide a hypothetically stated willingness-to-pay better predicting real purchase behavior than low involved individuals.

4.4 Product Involvement

Interestingly, the study of Bei and Widdows (1999) tested two hypotheses contradictory to the theory discussed above. The authors supposed that the effect of product information on low involved consumers is greater than on highly involved consumers. They formed the hypothesis that the effect of providing consumers with complex information is greatest for low involved and knowledgeable consumers. The rationale behind these two hypotheses was based on the reduced price consciousness and the increased brand loyalty of highly involved consumers. In this study involved consumers are supposed to already own too static attitudes or beliefs thereby hindering the acceptance of new information. It has to be stated that these two hypotheses of information usage of involved consumers were not significantly ($p > 0.10$) proven by Bei and Widdows (1999), $H5: F(1,271) = 2.39, p > 0.10$ and $H6: F(1, 271) = 0.38, p > 0.10$.

The question arises why product involvement and product knowledge are considered separately. Product involvement and product knowledge are known to be correlated. This correlation has been empirically tested in several studies, but both concepts have been treated separately. Sujan (1985) for instance found a significant correlation between involvement and product knowledge ($r = .51$), but concluded “that knowledge has an independent effect on processing, and that involvement or interest cannot explain the pattern of results obtained” (Sujan, 1985, p. 44). In Zaichkowsky's (1988) study surprisingly no relationship was found ($r = -.08$), although she admits that the questions used “[do] not seem to be a reliable tool for measuring knowledge of wine to average consumers.” (Zaichkowsky, 1988, p. 326). Considering the study of Bei and Widdow's (1999) correlation measure between knowledge and involvement was also rather low ($r = .22$) whereas the results of Celsi and Olson (1988) show the diverse influences of product knowledge and product involvement quite clearly. Knowledge is “related to the focus comprehension processes and the elaborative inferences produced by these processes” (Celsi & Olson, 1988, p. 221). Involvement on the contrary influences the attention and comprehension processing. Knowledge has the highest effect on the product judgments, whereas the motivational state of involvement determined the amount of effort in attention and comprehension. In simple terms, involvement can be understood as *moti-*

vation to process and search; product knowledge can be seen as *ability to process* (Celsi & Olson, 1988). Highly knowledgeable consumers do not necessarily have a motivation to use their internally stored information, if they perceive the decision as non-relevant. Similarly, high involvement does not always lead to skillful decisions.

4.5 Product Knowledge

Product knowledge is defined to “encompass the amount of accurate information held in memory about product alternatives as well as buyers' self-perceptions of this product knowledge” (Rao & Monroe, 1988, p. 255). Furthermore, Alba and Hutchinson (1987) propose that product knowledge is based on two components: familiarity and expertise. Familiarity refers to the product related experiences a consumer has made, whereas expertise is the “ability to perform product-related tasks successfully” (Alba & Hutchinson, 1987, p. 411). For illustration, think of the different kind of knowledge a race car driver has compared to his/her technician. The race car driver has learned to control the car by repetition (familiarity), but his/her technician knows every single part and also which one to modify in order to achieve the maximum performance (expertise). The definitions of both components are relatively broad: advertising exposures and interactions with salespersons increase the consumers' familiarity with a product and simple beliefs about product attributes enrich consumers' expertise. Furthermore a higher level of familiarity generally results also in a higher level of consumer expertise (Alba & Hutchinson, 1987).

When structuring different products, consumers tend to use a mental scale for orientation in order to classify similarities and dissimilarities. The dimension, on which this classification occurs, is referred to as the *basic level*, “objects tend to be spontaneously named at this level, and discrimination at this level tends to be easier than at other levels.” (Alba & Hutchinson, 1987, p. 415) In this context, two issues concerning expertise appear relevant for the reduction of uncertainty in the decision-making process: first, knowledgeable consumers have an increased ability to discriminate *below the basic level*. This means, familiar consumers may distinguish products based on smaller differences, e.g., discrimi-

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nation of wine based on the grape, the year and the region of origin. Second, more familiar consumers are furthermore able to discriminate at a more abstract level, *above the basic level*, – e.g., typical classifications at the basic level for food would be vegetables, meat, fruits. Beyond this, one could discriminate between high and low protein foods and establish cross-references. This advanced discrimination requires knowledge above normal level. The development of categories above the basic level enables experts to evaluate a more heterogeneous set of alternatives compared to novices, whereas the formed categories below the basic level allow the evaluation of a more homogeneous set of alternatives. Lastly, the deeper categorization structure prevents the expert from overgeneralizing and undergeneralizing (Alba & Hutchinson, 1987). Besides experts having more and stronger links among concepts (Chi & Koeske, 1983), they own a better organization of their knowledge rendering the information processing more efficient (Fiske, Kinder, & Larter, 1983). Because of the better organization and experience product knowledge liberates cognitive resources, which the expert can then devote to the acquisition of new information (Alba & Hutchinson, 1987).

Increased product familiarity eases consumer decision-making in the way that repetition reduces the necessary cognitive effort. As a task becomes more and more common, the individual's learning process speeds up the execution but keeps the performance constant. This effort reduction occurs already after a few experiences with the product (Alba & Hutchinson, 1987). Applied to the purchase situation, high familiarity consumers should be able to derive a buying decision faster and more easily due to their experience.

Product knowledge is a key determinant of consumers' search behavior in the form of influencing the source of information and selecting the degree of analysis of incoming information (Marks & Olson, 1981). Experts are looking for specific information, because they know they exist and perceive them as important, whereas novices are more dependent on the information they receive (Brucks, 1985). Additionally experts are able to focus their evaluation on the most relevant and important characteristics and screen out less interesting cues (Alba & Hutchinson, 1987). Prior knowledge enables a weighting of

attributes according to their relevance. When buying a computer in a store, we can imagine the novice to rely on brief product descriptions, prices and brands, evaluating each information to the same degree. In contrast, the expert would focus on attributes he or she knows are crucial for a high quality computer: processor, hard drive space, energy-efficiency while neglecting other cues he or she perceives less relevant. If an important product characteristic is missing, the expert is able to explicitly ask for that specific information.

Experts have also been shown to process more inconsistent information than novices, which is seen as a proof of increased efficiency of experts' processing (Fiske et al., 1983). Further investigations of Sujan (1985) showed that experts either rely on their categorization structures if the provided information is congruent with their prior knowledge or start analytical processes if product information conflicts with their categorization. Novices on the contrary lack this increased ability of processing product relevant information and are more susceptible to product category labels instead of real product attributes (Sujan, 1985). Additionally novices were found to use more subjective information and recommendations (King & Balasubramanian, 1994). This behavior can be interpreted as a sign of increased uncertainty.

The provided literature clearly indicates that knowledgeable consumers in general have an increased ability in assessing the quality of a product. Experts evaluate more product information due to their better organized internal knowledge structures. It has been clearly validated that consumers with higher levels of product knowledge make better assessments of product quality (Rao & Monroe, 1988). Park and Lessig (1981) moreover provide results which suggest that respondents' confidence in choice decision increases with the level of familiarity. The positive relationship between knowledge and confidence in the validity of the knowledge is also put forward by Fiske, Kinder and Larter (1983). Garb's results (1989) suggest that experience leads to better knowledge which of their judgments could be correct and which judgments could be incorrect. Finally, Heath and

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Tversky (1991) show that highly knowledgeable people in contrast to low knowledgeable people even pay a premium for betting on their own judgments rather than a randomly drawn solution.

These results strongly support the assumption that a better assessment of product performance or quality decreases a consumer's uncertainty. Experts process information more extensively and are able to better articulate evaluations of products, which are internally consistent and stable over time (de Bont & Schoormans, 1995). More specifically, for familiar products the identification of the personal willingness-to-pay may likely be easier than for products which are relatively unknown to the consumer (Fischhoff, 1991; Völckner, 2006a). Similar to product involvement, product knowledge is seen to decrease consumers' uncertainty in evaluating product quality due to more and better product information. The higher confidence in willingness-to-pay statements in turn should effectively moderate the predictability of the contingent valuation measurement. This relationship is formulated as hypothesis:

H₂ – Highly knowledgeable individuals provide a hypothetically stated willingness-to-pay better predicting real purchase behavior than low knowledgeable individuals.

4.6 The Price as Missing Cue

The increased ability to infer product quality of involved and knowledgeable consumers can also be seen from a different perspective, which also supports the hypothesis stated above. The quality perception process can be seen as a function of cue utilization (Olson, 1972). The term cue is defined as any informational stimuli of a product, that can be used to evaluate a product before consumption (Steenkamp, 1990). Extrinsic cues are not directly related to product performance, whereas intrinsic cues are in fact physical product characteristics (Rao & Monroe, 1989). An intrinsic attribute cannot be changed without changing the product. Typical examples for extrinsic information are the country of origin, the brand or the price, in contrast to the intrinsic information of ingredients or color. These

attributes provide information, but are not part of the product itself. Consumers usually consider both types of cues and use their prior knowledge for creating meaning to cues (Olson, 1972, 1978). Among others, prices are commonly used as quality indicators (Hair Jr, Anderson, Tatham, & Black, 1995). The price quality relationship is based on the assumption that the interaction of demand and supply will lead to cheapest prices. In this regard, the only reason for a higher price would be the usage of superior inputs or high quality fabrication (Scitovsky, 1945). Gerstner (1985) evaluated this positive relationship between quality and price for over 100 products and found in general only a weak correlation ($r = .19$ for nonfrequently and $r = .01$ for frequently bought products). The relationship between quality and price depends, however, on the product category.

In willingness-to-pay surveys where the price is not provided as a product attribute, the consumer needs to evaluate the products according to intrinsic attributes to a greater extent. The *You get what you pay for* of typical shopping situations changes to *You pay for what you get* in the willingness-to-pay context (Rao & Sieben, 1992). This situation is new for the consumer, since the accustomed situation for a consumer is to choose a product based on his/her preferences and the provided information he has, including the price information (Ruprecht, 2005).

Research showed that segments may differ in the importance they place on the price when evaluating products (Rao & Monroe, 1988). Etgar and Malhotra (1981) for instance demonstrated that consumers can be grouped on the basis of differing price-quality perceptions. “Although price was a highly important cue for some quality facets, its importance was relatively small for others” (Etgar & Malhotra, 1981, p. 221). In this context, product knowledge helps to discriminate consumers according to their usage of extrinsic information. Rao and Monroe (1988) and Park and Lessig (1981) showed the moderating role of product knowledge on information use. Low knowledgeable consumers primarily use extrinsic product information, because they lack the knowledge to assess quality correctly. In contrast, moderately familiar consumers focus solely on intrinsic information, whereas highly familiar buyers have acquired enough information to

4.6 The Price as Missing Cue

make use of extrinsic product cues additionally to intrinsic ones. Hence, experts are able to use both information and will prefer to use extrinsic attributes, if they are reliable indicators of quality, otherwise they will use their knowledge to evaluate the product's specification. As a result, low familiar buyers use the price cue because of the general belief of a price-quality relationship, while experts use the price cue because of their knowledge of a price-quality relationship for a certain product (Rao & Sieben, 1992; Rao & Olson, 1990). Furthermore, experts not only know how to assess the price-quality relationship, but they will additionally learn the market's price levels, which in turn influences their willingness-to-pay (Rao & Sieben, 1992). Consumers without price knowledge hold a lower acceptable price level (Fouilhe, 1970; Kosenko & Rahtz, 1988) and knowledgeable consumers were shown to adapt the market's price range as their willingness-to-pay (Rao & Sieben, 1992).

Furthermore, Zaichkowsky (1988) proved that involvement affects the usage of price in product evaluation. Although low and highly involved consumers had to pay the same price for the same product “the low involved individuals placed more emphasis on price in their evaluation of the alternatives than the high involved individuals” (Zaichkowsky, 1988, p. 326). For low involved consumers product evaluation is rather seen as a burden, therefore price as a low effort attribute is preferred. The highly involved consumers on the contrary value complex information because the outcome is highly relevant to them. As active information seeker they reach a point where they can differentiate the products very precisely according to the intrinsic product specifications. The set of decision factors enlarges while involvement increases thereby at the same time decreasing the relevance of a single attribute, for instance the price. Involvement leads to a shift of importance from the simple, extrinsic attribute price to the more complex intrinsic product characteristics. “In other words, as involvement goes up relative weight given to the price cue goes down in evaluating alternatives for probability of purchase” (Zaichkowsky, 1988, p. 326).

The different usage of the price as cue indicates that quality assessments can be made more thoroughly with increased knowledge and involvement in the willingness-to-pay context. If the consumer is used to depend on the price as an indicator for product quality he or she will have difficulties in the evaluation when a price as cue is missing. In this case, a higher uncertainty concerning product performance evaluation is likely. These considerations support the already elaborated hypotheses that involvement and product knowledge increase the certainty in determining product evaluations but from a different perspective. Involved and knowledgeable consumers are willing and able to use product attributes for the determination of product quality.

4.7 Preference Uncertainty

Besides product quality uncertainty, preference uncertainty has been identified as the second category of consumers' uncertainty in willingness-to-pay statements (Urbany et al., 1989; Wang et al., 2007). Fischer, Luce and Jia (2000, p. 88) define preference uncertainty among two alternatives as “being not sure which alternative one prefers, or to what degree.” Ambivalence or preference uncertainty arises when alternatives are good in one respect but bad in another one. This characteristic is referred to as attribute conflict (Fischer et al., 2000). A potential buyer needs to outweigh the advantages and disadvantages according to his/her preferences, which may lead to preference uncertainty (Fischer et al., 2000). If the attributes are at the very high or very low end of the attribute scale the evaluation is easier. Such values leave less possibility to trade the attribute off due to their extremity (Fischer et al., 2000). The difficulty in preference formation depends on the amount of alternatives and their attributes. Whichever choice is made, the decision maker is likely to experience feelings of regret or emotional loss for giving up the positive features of the foregone alternative (Fischer et al., 2000). Another possible source for preference uncertainty is when consumers are not familiar with the situation (March, 1978). However, even if the consumer has perfect information he or she may still be uncertain about his/her own preference (March, 1978; Wang et al., 2007).

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The consumers' goals may also lead to inconsistent decisions. He or she may want to minimize the cognitive effort, maximizing the accuracy, minimizing negative emotions, maximizing the ease of justification or a combination of these goals (Bettman et al., 1998). The goal of high accuracy is certainly conflicting with the goal of a low cognitive effort leading to different preferences. Depending on personal goals, a consumer's decision strategy in a purchase situation may vary from complex to very simple or selective. Selective decision making would mean just to focus on a single attribute, e.g., buying the safest car. Complex decision strategies include various attributes and finding an algorithm how to relate them to each other. The weighted additive value model is a prominent decision strategy (Fischer et al., 2000). Each attribute of an alternative is rated and then multiplied by a value representing the value of the attribute. The resulting values are summed up for a final ranking of alternatives. The consumer may be uncertain especially how to trade off single alternatives. Thinking about buying a new car; what would be one's trade off rate for energy efficiency to horsepower? Trading off attributes against each other requires much more cognitive resources than simpler forms of decision making (Bettman et al., 1998).

The trade-off shows not only how extensive such processes can be, they also mean evolving decisions accompanied by negative emotion. Humans do not simply process information like computers. In general a perceived loss is weighted more than a perceived gain, known as *loss aversion* (Kahneman & Tversky, 1979). These negative emotions can be avoided if a simpler choice criterion is used. Another possible goal of choice decision is the ease of justification. Decisions are often reassessed either by oneself or others. Some personal preferences may for instance conflict with other people's preferences, which are accounted for in decision making. "Choices are often made without respect to tastes. Human decision-makers routinely ignore their own, fully conscious, preferences in making decisions. They follow rules, traditions, hunches, and the advice or actions of others" (March, 1978, p. 596).

By interpreting willingness-to-pay as preference statements (Ryan & San Miguel, 2000), the problem arises that the underlying preferences are often not existing. People obviously do not always have stable and well-articulated preferences, but rather construct them on the spot (Bettman et al., 1998). Instead of revealing preferences people often have to form them during the decision making process. “Consumer preference formation may be more like architecture, building some defensible set of values, rather than like archeology, uncovering values that are already there“ (Bettman et al., 1998, p. 188). Of particular importance for the willingness-to-pay measurement is that these ad hoc formed preferences are in general not stable. “One of the most important principles resulting from the past 15 years of research in decision making is that when preferences are constructed at the time of measurement, rather than retrieved from something the consumer knows already, the trade-offs elicited are unstable and can be easily changed by small changes in measurement procedure” (Hoeffler, 2003, p. 406).

As a result, preference uncertainty leads to a stronger influence of procedural and descriptive effects on respondent's expressed preferences (Payne, Bettman, & Johnson, 1992). Framing effects are prominent examples of such influences. Framing effects refer to the impact the presentation (e.g., the wording) of the alternative has on the respondent's answer (Tversky & Kahneman, 1981). The method of asking can make a difference to the outcome. The form of presentation may affect the respondent's preferences, especially when the respondent is ambiguous (Payne et al., 1992). The shelf position of a chocolate bar is likely to have an influence on an ambiguous consumer in his/her preference construction.

Consumers who are familiar and experienced with a product are more likely to own well-defined preferences and their behavior follows rational choice theory more closely (Bettman et al., 1998). More specifically, Wang et al. (2007) found that the greater a consumer's preference uncertainty for a product, the greater is his/her range in willingness-to-pay for the product. In contrast, a high preference strength means a clear and stable decision structure (Mishra et al., 1993). Similarly, Fischer et al. (2000, p. 90) stated

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that “greater preference uncertainty should be associated with greater response error – that is, greater inconsistency between a particular decision maker's evaluation of an identical stimulus at different times.” Preference uncertainty likely leads to a larger fluctuation of willingness-to-pay. It is reasonable to suppose higher difficulties with the elicitation of reservation prices. Especially in metric terms, uncertainty hinders to arrive at a value for the degree of preference (Fischer et al., 2000).

Some people are believed to already hold strong preference schemes for a certain product category, others are probably more unclear, what fits them best (Bettman et al., 1998). The honest determination of the maximum price one is willing to pay is not a trivial task, but rather a laborious, cognitive process. Some respondents do not only need to decide which product attribute to weigh, but also what their preferences are. The determination of willingness-to-pay values from unspecified preferences is supposed to be difficult. Furthermore, research has shown that these preferences are less stable. Hence, respondents should differ in their ability to arrive at their willingness-to-pay (DuBourg et al., 1997).

H_3 – Individuals having well-defined preferences provide a hypothetically stated willingness-to-pay better predicting real purchase behavior than individuals who are uncertain about their own preferences.

5 Empirical Study

5.1 Methodology

The proposed causal relationships between the discussed consumer characteristics and the uncertainty in willingness-to-pay responses can be implemented in a regression model in order to forecast true willingness-to-pay. According to the established hypotheses, the true willingness-to-pay values as dependent variable can be predicted by its relationship with the contingent valuation method and the discussed consumer characteristics (involvement, product knowledge and preference uncertainty) as moderators of this relationship. A

moderation effect exists if the relationship of two variables varies as a function of a third variable, the moderator (Zedeck, 1971). For a validation of this forecasting method, the moderation effects first need to be verified.

Two studies with equal study design have been conducted accordingly via face-to-face interviews. Chocolate bars were chosen as the subject of the study, as they represent a cheap mass-moving commodity people can easily afford. These have also been used in other pricing studies (Bhatia & Fox-Rushby, 2003; Johannesson, Liljas, & O'Connor, 1997; Kaas & Ruprecht, 2006; Wang et al., 2007). Two different brands with different flavors were sold: *Hachez* – milk chocolate and *Feodora* – dark chocolate. Both brands are in the mid price range, 1.20€ to 2.10€ and both brands have only small market shares in Germany, thereby reducing likely anchor effects of remembered existing market prices. The small market share further is likely to prevent the respondents to use the brand as a cue in the decision process.

Both studies featured a within-group design in the form that every respondent provided willingness-to-pay judgments for the preferred chocolate bar in a contingent valuation and a BDM lottery. In the first study 357 travelers at a major German airport and in the second study 214 business students of a German university took part in the research project. The airport sample is considered as more heterogeneous. Not all respondents answered the contingent valuation question and participated in the BDM lottery and thus were removed from the analysis. From the initial 357 participants 268 respondents remained in the first study, AIR sample, and from 214 people 186 respondents in the second study, UNI sample.

The respondents were not informed about the purpose of the studies. First, consumers answered the contingent valuation question; how much respondents would maximally pay for the two chocolate bars. Second, participants were asked about their consumption behavior, for instance about their favorite brands of chocolate bars. These questions aimed at reducing the focus on willingness-to-pay but were not part of the analysis itself. Addi-

5.1 Methodology

tionally, their individual levels of product involvement, brand knowledge, familiarity and preference uncertainty were assessed. In the last step, the respondents were buying their preferred chocolate bar via the BDM lottery. The BDM mechanism was explained to the respondents as well as the reason why the best strategy was to state their true willingness-to-pay, analogous to the study of Wertenbroch and Skiera (2002). The price distribution of the lottery was not communicated to the respondents in order to avoid anchoring effects (Bohm et al., 1997). All respondents had the opportunity to take a closer look and examine the products packaging details. Furthermore, the participants were informed that their given bid was binding and that winners were obliged to buy the chocolate. After stating their willingness-to-pay in the BDM procedure, they drew a ticket for the determination of the actual price. The respondents did not receive any compensation for their participation. Receiving money by the researches, so-called windfall gains, have been shown to influence the respondent's propensity to spend (Thaler & Johnson, 1990).

The respondents' involvement was measured by Zaichkowsky's Personal Involvement Inventory (1994). Pre-tests showed that the item of *appealing* was not applicable to the product category of chocolate bars, consequently it was discarded. A factor analysis revealed two factors explaining 72% of total variance. The differentiation in cognitive and affective involvement on the basis of the items' factor loadings was congruent to the theory of Zaichkowsky (1994).

Regarding the measurement method for consumer knowledge, the recommendations of the literature is in dispute (Brucks, 1985; Sujan, 1985). Objective knowledge, subjective knowledge or product familiarity were identified as important dimensions (Cordell, 1997). Objective knowledge reflects the acquired knowledge stored in longterm memory (Park, Mothersbaugh, & Feick, 1994), whereas subjective knowledge refers to the amount of knowledge a person presumes to hold (Brucks, 1985). Objective knowledge is assessed by asking product specific questions, which should well reflect the level of knowledge. Finally, familiarity with a product category is also used to measure knowledge. When have you last purchased a pair of jeans? – would for instance be a question concerning

familiarity. Some researchers use all three measurements for a balanced value (Rao & Monroe, 1988). Cordell (1997) concludes that none of the discussed measurement options of expertise can significantly predict more efficiently than the others.

Instead of asking product specific questions, the constructs brand knowledge and familiarity were seen more adequate and practical for the measurement of product knowledge. “Brand knowledge relates to the knowledge one possesses regarding the brands that exist in a product category, how brands compare on different attributes, and which brands possess which attributes” (Baker, Hunt, & Scribner, 2002, p. 47). The advantage of brand knowledge is that it can be much easier adapted than product specific questions. This better meets the requirement for a flexible forecasting method than concrete questions about the respondent's product knowledge. Brand knowledge was assessed by asking – *How well do you know the following brands?* – and the rating of seven brands from different chocolate manufacturers on a five point scale between “unknown” to “very well-known”.

Besides expertise, familiarity has been identified as an important component of product knowledge (Alba & Hutchinson, 1987). Familiarity with chocolate bars was inferred by the amount of chocolate bars bought in the last seven days. In contrast to brand knowledge the question on familiarity covers the experience with the whole product class. Respondents who purchased more than 3 chocolate bars were classified as highly familiar and respondents with a lower consumption were coded as low familiar consumers. Finally, preference uncertainty was measured by a five-point semantic differential with “do not like it at all” and “do like it very much” as anchors for eight different chocolate flavors, e.g., milk chocolate, milk chocolate with hazelnut, white chocolate, chocolate with yogurt. The strengths of the respondent's liking and disliking relative to the indifference option was used to derive his/her preference uncertainty values. The questionnaire was developed by Prof. Dr. Christina Sichtmann.

5.1 Methodology

In order to test for moderation effects, the raised data were included in a moderated multiple regression analysis which is schematically illustrated in Figure 2. The moderated regression analysis is seen as the preferred statistical procedure for detecting interaction effects (Aguinis, 1995; Russell & Bobko, 1992). As previously discussed, the measurement method of the BDM was seen as approaching the true willingness-to-pay the closest and was used as the criterion. Except for familiarity, which was coded high and low state, the measured continuous data is used for the regression model.

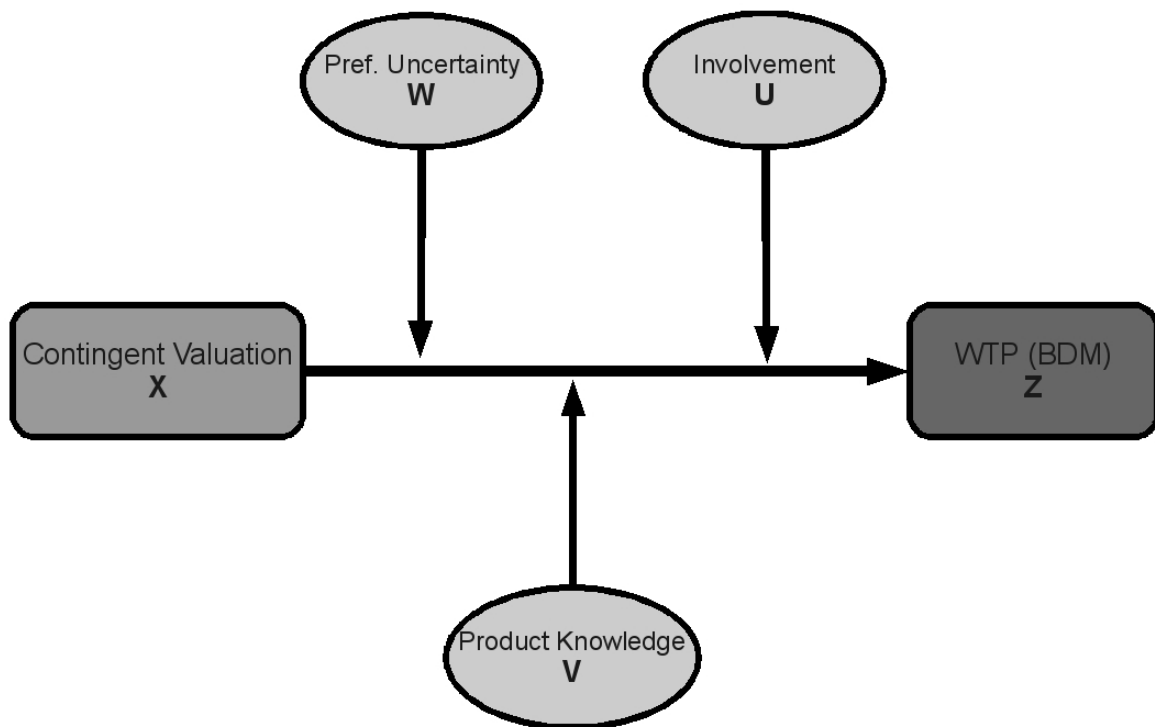


Figure 2: Model of Hypothesized Relationships

In a first step, the contingent valuation measurements X were introduced as predictors in the regression model and the BDM measurement as criterion Z . Following Baron and Kenny (1986), the consumer characteristics involvement U , product knowledge V and preference uncertainty W were also included as predictors in the equation. The concept of involvement was differentiated in cognitive U_1 and affective U_2 involvement (cf. Zaichkowsky, 1994). Furthermore, product knowledge was assessed by brand knowledge V_1 and familiarity V_2 .

$$(1) \quad Z = b_0 + b_1 X + b_2 U_1 + b_3 U_2 + b_4 V_1 + b_5 V_2 + b_6 W$$

The products between the direct price elicitation and each consumer characteristic were then included in the regression model in a second step. In order to prevent distortions due to multicollinearity the variables were mean-centered for the multiplication (cf. Aguinis, 1995). The two steps are required in order to eliminate the direct effects of the consumer characteristics, as the product terms carry information both of the main effect and the moderation (Bedeian & Mossholder, 1994).

$$(2) \quad Z = b_0 + b_1 X + b_2 U_1 + b_3 U_2 + b_4 V_1 + b_5 V_2 + b_6 W + b_7 X U_1 + b_8 X U_2 + b_9 X V_1 + b_{10} X V_2 + b_{11} X W$$

The consumer characteristics moderate the direct price elicitation, if a product term's t-statistic between the R^2 s of the first and the second model is significant (Aguinis, 1995). Note that the overall R^2 is not decisive for a theory-based identification of moderating effects (cf. Bedeian & Mossholder, 1994).

5.2 Results – Descriptive Statistics, Validity

In total, more respondents in both samples preferred the *Hachez* milk chocolate (Table 1). In the UNI sample the students showed a more balanced distribution for the two chocolate brands. The average willingness-to-pay judgments for the chocolate bars lied between € 0.74 and € 1.41. The given values ranged from € 0 to € 5 in the AIR and from € 0 to € 4 in the UNI sample. The mean comparison reveals no significant difference in willingness-to-pay between the two samples (Table 2). The differences of the samples' average measured willingness-to-pay range from 1 Cent to 12 Cent. Concerning the consumer characteristics the preference uncertainty is the only significant difference among the two samples (Preference Uncertainty: $M_{\text{AIR}} = 1.31$, $M_{\text{UNI}} = 1.22$; $t(452) = 3.09$, $p < 0.05$). The AIR sample is in general more uncertain in its preferences.

AIR	n	CV	BDM	Mdn CV	Mdn BDM	SD CV	SD BDM
Feodora	81	€ 1.16	€ 0.74	€ 1.00	€ 0.89	€ 0.82	€ 0.59
Hachez	187	€ 1.41	€ 0.89	€ 1.40	€ 1.00	€ 0.69	€ 0.57
UNI							
Feodora	77	€ 1.19	€ 0.85	€ 1.00	€ 0.90	€ 0.76	€ 0.52
Hachez	109	€ 1.41	€ 1.00	€ 1.30	€ 1.00	€ 0.60	€ 0.49

Table 1: Descriptive Statistics

CV	AIR-UNI in €	AIR-UNI in %	t	df	Sig. (2-tailed)
Feodora	-€ 0.03	-2.7%	-0.26	156	.799
Hachez	€ 0.01	0.5%	0.09	294	.928
BDM					
Feodora	-€ 0.11	-12.9%	-1.25	156	.214
Hachez	-€ 0.12	-11.5%	-1.76	294	.080

Table 2: Comparison of Samples

In the study of Wertenbroch and Skiera (2002) face validity was assessed among other tests by Fisher Z scores of the correlations between the willingness-to-pay measurements and the amount respondents indicated to normally pay for a can of Coke and a piece of cake. They found that this amount more strongly correlated with willingness-to-pay measured by contingent valuation than with the BDM mechanism (Coke: $Z_{\text{BDM}} = .26$ versus $Z_{\text{match}} = .32$; $z = -.37$, $p < 1$; cake: $Z_{\text{BDM}} = .03$ versus $Z_{\text{match}} = .49$; $z = -3.06$, $p < .01$). According to the Wertenbroch and Skiera (2002, p. 233) this finding showed that respondents in the contingent valuation “anchor their responses on a reference price instead of carefully determining their situation- and context-specific true WTP.” The present study's data differ from this finding. The price respondents normally pay for a similar chocolate bar was in fact more strongly correlated with the BDM measurement (BDM: $Z_{\text{AIR}} = .29$, $p < 0.01$; CV: $Z_{\text{AIR}} = .27$, $p < 0.01$ and BDM: $Z_{\text{UNI}} = .24$, $p < 0.01$ CV: $Z_{\text{UNI}} = .11$, $p > 0.5$). A reason for this different finding may be that in the Wertenbroch and Skiera (2002) study a slightly different approach of the open-ended contingent valuation was used, denoted as price matching. The exact elicitation method used in the above mentioned study, e.g.,

question formulation, could not be determined. Nevertheless, the assumption that people use the normally paid price more prevalently as a reference price in the contingent valuation than in the BDM is not supported by the present results.

Regarding validity of the incentive compatible BDM mechanism, only 15.8% and 28% of the respondents indicated that they would revise their bid in a renewed BDM lottery in the AIR and UNI sample respectively. These percentages are substantially lower than those presented by Kaas and Ruprecht (2006), where 47% and 41% of auction losers were willing to revise their bids. Additionally, all respondents in the AIR and UNI sample obliged to buy in the BDM lottery actually bought the chocolate bar, which is a sign for high criterion validity (Völckner, 2006b). In the study of Wertenbroch and Skiera (2002), which featured a lower sample size, 2.5% and 7.5% respondents of the two samples refused to follow the purchase obligation.

For an examination of internal validity, the individual willingness-to-pay values of the two samples were aggregated in the form of price response functions (see appendix, Figure 3-6), i.e. how many respondents bought the product as a function of price. It is examined how many people expressed a willingness-to-pay at least as high as the relevant price level (Skiera & Revenstorff, 1999). Then, the data's fit to linear, $y = a + bx$, and multiapplicative, $y = a \cdot b^x$, models was calculated (Simon & Fassnacht, 2008; Skiera & Revenstorff, 1999). The fit of the data reveals an overall good internal validity of either the linear or multiapplicative function ($R^2 > .90$). The exact results can be found in the appendix (Table 7 & Table 8).

		$\overline{\text{CV-BDM}}$ in €	$\overline{\text{CV-BDM}}$ in %	<i>t</i>	<i>df</i>	<i>Sig. (2-tailed)</i>
AIR	Feodora	€ 0.42	56.7%	5.1	80	.000
	Hachez	€ 0.53	61.8%	8.85	186	.000
UNI	Feodora	€ 0.34	38.7%	3.96	76	.000
	Hachez	€ 0.40	40.3%	6.86	108	.000

Table 3: Comparison of Methods

A comparison of both measurement methods (Table 3) shows that the willingness-to-pay levels elicited by the contingent valuation method on average exceed those of the BDM in all four cases, both chocolate bars in both samples. This finding is probably best visualized by the price response functions in the appendix (Figure 3-6), where the contingent valuation curve nearly always lies above the BDM curve. Each chocolate bar is on average valued significantly higher in the hypothetical contingent valuation. The size of the difference ranges from 34 Cent to 53 Cent, which represents an overestimation of 38.7% and 61.8% respectively. In line with the reviewed literature, these results not only support the existence of hypothetical bias, but once more illustrate the decisive effect of different willingness-to-pay measurement methods and the associated risk of the method choice for practitioners. In the study of Wertenbroch and Skiera (2002) the overestimation of contingent valuation relative to BDM was of slightly lower, 27.4% for Coke and 50% for cake.

In conclusion, 76.5% of the respondents in the AIR sample and 81.2% of the respondents in the UNI sample stated a different willingness-to-pay in the hypothetical (CV) and real situation (BDM) for the same chocolate bar. Interestingly, a substantial number of respondents also understated their willingness-to-pay in the contingent valuation. 14.2% of the entire AIR sample and 15.6% of the UNI sample gave lower willingness-to-pay responses in the hypothetical than in the real setting. It is difficult to differentiate whether these understatements are a sign of strategic behavior or a general shortcoming of the contingent valuation method linked to the hypothetical elicitation.

Furthermore, a certain importance of major price points, e.g., € 1 or € 1.5, is illustrated by the price response functions in the appendix (Figure 3-6). Apparently, respondents orient themselves at major price points when setting their personal willingness-to-pay (Gregory et al., 1993). Similar results are presented by Wertenbroch and Skiera (2002). However, the difference in the shape of the distribution between the two measures does not seem as extreme as in Wertenbroch and Skiera's study (2002). The importance of major price points is also apparent in the BDM data. Only the price response function for the Feodora

Dark Chocolate of the UNI sample exhibits a noticeable stair-like distribution for the direct price elicitation (Figure 6). It is striking that the importance of major price points appears just for this brand. The number of respondents buying this chocolate bar in both samples is nearly the same (81 respondents in AIR versus 77 respondents in UNI).

5.3 Results – Regression

The initial run of the regression models revealed multicollinearity in the data. In both samples the variance inflation factors were greater than 10 for the moderator product term of familiarity and the contingent valuation measurement. The correlation coefficient of the two variables was also particularly high ($r > .9$, $p < .01$ for both samples). The average VIF denoted 3.39 in the AIR sample and 4.52 in the UNI sample and the model was thus most likely biased (Field, 2005). As a consequence, it was deemed necessary to omit familiarity from the regression model. The second run of the regression did not suffer from multicollinearity. Additionally, the Durbin-Watson value is sufficiently close to the value of 2 (AIR: 1.63; UNI: 1.89) and thus the assumption of independent errors is tenable. Furthermore, there are no signs of non-linearity or heteroscedasticity in the plot of standardized residuals against standardized predicted values and the assumption of the normality of residuals is seen as sufficiently met.

AIR				
	<i>R²</i>	<i>adjusted R²</i>	<i>F</i>	<i>Sig.</i>
Step 1	.118	.101	7.01	.00
Step 2	.147	.117	4.94	.00
UNI				
	<i>R²</i>	<i>adjusted R²</i>	<i>F</i>	<i>Sig.</i>
Step 1	.149	.125	6.29	.00
Step 2	.198	.157	4.84	.00

Table 4: Summaries of Regression Models

5.3 Results – Regression

	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>Sig.</i>
Step1					
Constant	.35	.26		1.38	.17
Contingent Valuation	.21	.05	.28	4.56	.00
Cognitive Involvement	-.01	.04	-.02	-.24	.81
Affective Involvement	.06	.04	.13	1.63	.10
Brand Knowledge	.05	.05	.06	.99	.32
Preference Uncertainty	-.17	.11	-.09	-1.58	.12
Step2					
Constant	.35	.26		1.36	.18
Contingent Valuation	.24	.05	.30	4.93	.00
Cognitive Involvement	-.01	.04	-.02	-.19	.85
Affective Involvement	.05	.04	.11	1.34	.18
Brand knowledge	.06	.05	.07	1.15	.25
Preference Uncertainty	-.19	.11	-.10	-1.70	.09
CV X Cog. Inv.	-.05	.06	-.10	-.94	.35
CV X Aff. Inv.	.09	.06	.15	1.51	.13
CV X Brand Knowledge	-.19	.08	-.14	-2.45	.02
CV X Pref. Uncertainty	.06	.14	.03	.44	.66

Table 5: Regression Results – AIR

	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>Sig.</i>
Step1					
Constant	.48	.27		1.77	.08
Contingent Valuation	.26	.05	.35	4.81	.00
Cognitive Involvement	-.03	.04	-.08	-.76	.45
Affective Involvement	.06	.05	.13	1.22	.23
Brand knowledge	.03	.06	.04	.52	.60
Preference uncertainty	-.06	.13	-.03	-.46	.65
Step2					
Constant	.58	.27		2.15	.03
Contingent Valuation	.25	.06	.33	4.45	.00
Cognitive Involvement	-.03	.04	-.08	-.74	.46
Affective Involvement	.06	.05	.14	1.30	.19
Brand knowledge	.00	.06	.00	.04	.97
Preference uncertainty	-.06	.13	-.03	-.48	.63
CV X Cog. Inv.	.00	.06	-.01	-.05	.96
CV X Aff. Inv.	-.08	.06	-.16	-1.33	.19
CV X Brand Knowledge	-.13	.09	-.12	-1.47	.14
CV X Pref. Uncertainty	-.11	.22	-.04	-.51	.61

Table 6: Regression Results – UNI

The regression models explain a relatively small share of the variability of the outcome that is accounted for by the predictors (Table 4). This unfortunately shows that the predictors could only explain roughly 15% in the AIR sample and 20% in the UNI sample of the real willingness-to-pay measured by BDM. The adjusted R^2 values still are also slightly higher for the UNI sample.

Regarding the regression coefficients (Table 5 & Table 6), support for the theoretical relationships between the examined consumer characteristics and the hypothetical willingness-to-pay elicitation can not be found. Except the contingent valuation, no predictor made a significant contribution to the model in both samples. H_1 , stating that involved consumers give a willingness-to-pay closer to the real willingness-to-pay, is not supported because neither cognitive nor affective involvement had a significant influence in both

5.3 Results – Regression

samples. H_2 , stating that knowledgeable consumers provide a more realistic willingness-to-pay in the contingent valuation, is also rejected by the data. In contrary to this hypothesis, brand knowledge in the AIR sample significantly moderated the relationship between the contingent valuation and the BDM in the opposite direction. With increasing brand knowledge the contingent valuation measurement less predicted the BDM values. This relationship contradicts the hypothesis that knowledgeable respondents should form their hypothetical willingness-to-pay with more confidence due to their increased information processing capabilities. Strategic behavior might be an explanation for this result, namely that participants with high brand knowledge were less willing to state their true willingness-to-pay. Finally, also H_3 is not supported. Preference uncertainty did not significantly increase the match between respondent's hypothetically elicited willingness-to-pay and the real value.

If the model had been successful, the adjusted beta values would have specified to what degree each moderator influenced the accuracy of the hypothetically stated willingness-to-pay. Consequently, a contingent valuation measurement plus an assessment of product involvement, product knowledge and preference uncertainty would have allowed to predict the respondent's real willingness-to-pay, (as if he had taken part in a BDM lottery).

Although the R^2 values do not directly provide information about the occurrence of moderating effects, they still illustrate a limited success of the model's predictability. A temporary exclusion of the most influential cases did not improve the model of both samples. The data was also tested for non-linear relationships and a logarithmic transformation of the data was carried out, but the regression model could not be improved. In any case, the hypotheses H_1 , H_2 , H_3 must be dismissed. In the face of these results, the intended calibration of the contingent valuation measurement is not possible. Due to the missing moderation effects, forecasting using this approach is not viable.

6 Conclusions and Further Research Directions

The moderated regression results of both studies did not support the expected moderating role of the consumer characteristics involvement, product knowledge and preference uncertainty. An accurate prediction of consumers' willingness-to-pay is not possible with the proposed characteristics alone. A finding contradictory to the elaborated theory was that in the AIR sample respondents with higher brand knowledge gave less realistic willingness-to-pay values than participants with lower brand knowledge.

The question remains why the consumer characteristics did not have the supposed relationship on willingness-to-pay elicitation. The validity comparisons with other pricing studies do not indicate data-related issues to have distorted the analysis. The hypotheses testing was rather comprehensive with two samples of adequate sample sizes. Except for the preference uncertainty, no significant differences have been found among the two samples. The measured willingness-to-pay values as well as the assessments of the consumer characteristics appear plausible.

Strategic behavior of respondents in the contingent valuation may be an explanation. The fact that brand knowledge in the AIR sample significantly moderated the relationship between the contingent valuation method and the BDM lottery suggests the incidence of strategic behavior. Respondents, who had a better brand knowledge and probably recognized the offered brand, may have provided a lower willingness-to-pay because they speculated on receiving the chocolate for this price or on price reductions of the producer. The results of List (2001) showed a similar finding. Nondealers of sportscards were affected by the warnings of the hypothetical bias, whereas the dealers, a group with presumably high knowledge and high familiarity, remained unaffected. Blumenschein (2008), who also tested for the cheap talk calibration, found that the hypothetical bias of only the informed and experienced participants was not reduced.

However, the purpose of the study, namely the elicitation of willingness-to-pay, was not communicated to the respondents. On the contrary, even the attempt was made to disguise the focus on pricing by asking additional questions regarding the chocolate purchase behavior. Furthermore the detailed questioning on involvement, brand knowledge, familiarity and preferences for chocolate flavors do certainly not represent suspicious elements for the focus of willingness-to-pay. More importantly, brand knowledge had a significant but weak influence in only the AIR sample, whereas the UNI sample does not feature any significant moderation effects. In addition, it is astonishing that only the brand knowledge and not involvement had an influence on the hypothetical willingness-to-pay elicitation. These considerations argue against strategic bias being the exclusive explanation for the missing verification. In any case, further research is needed to clarify if a relationship between product knowledge and an increased strategic behavior exists, also with regard to the studies of Blumenschein (2008) and List (2001). The exact nature and implications of strategic behavior are generally seen as an important research field for the development of hypothetical willingness-to-pay measurement methods.

A second possible explanation is based on the fact that the contingent valuation values showed to be relatively unrelated to the real willingness-to-pay values elicited by the BDM. The correlation coefficient denoted $r = .3$, $p < 0.01$ and $r = .37$, $p < 0.01$ for the UNI and the AIR sample respectively. For two methods supposed to measure the same concept these coefficients are surprisingly low. This suggests that people did not excessively use the contingent valuation as a starting point for the inference of real willingness-to-pay. It shows that the willingness-to-pay for the BDM lottery and the contingent valuation were answered more or less independently. Furthermore, the fact that not only overstatements but also understatements occurred in the contingent valuation needs to be explained.

On the basis of these results, it is plausible that differences in the cognitive processes between answering hypothetical and real willingness-to-pay inquiries exist. Consumers may consider different cues or follow different strategies in the determination of willing-

ness-to-pay between hypothetical (e.g., CV) and real purchase situations (e.g., BDM). The relevant literature indicates that cost-based considerations may represent such a different strategy.

The estimation of a product's costs has been found to be an important factor for the derivation of many consumers' hypothetically stated willingness-to-pay. For instance, Ryan and San Miguel (2000) investigated inconsistent preferences for two medical tests by asking directly for both preference and willingness-to-pay. Despite efforts of explaining the difference between cost and value, 30% of the respondents were willing to pay more for their less preferred option. 60% of these inconsistent responses were referring to the costs of the commodity. In other words, nearly a third of the respondents preferred the cheaper test, but were stating a higher willingness-to-pay for the more expensive test. Similar results have also been provided by Donaldson, Shackley, and Abdalla (1997) for open-ended contingent valuation. In this study at least 27% of the respondents mentioned cost as an explanation for their answer. By using verbal protocols, Schkade and Payne (1994) analyzed how people respond to willingness-to-pay and found evidence for the existence of explicit cost considerations in contingent valuation questions e.g., estimating their share to cover the total costs of saving wildlife. In this regard, the costs of a good seem to represent a dominant heuristic for deriving hypothetical willingness-to-pay values, as they provide basic information about value (Baron & Maxwell, 1996). "In sum, sensitivity to cost is present even when cost information is not itself provided in monetary form and when the manipulation of cost is not apparent to the subjects" (Baron & Maxwell, 1996, p. 181). The cost-based considerations are related to the concept of a *fair price* for public and private goods (Ryan & San Miguel, 2000). People do not want to be exploited by the producer and are not willing to exceed the cost of a product (Kahneman, Knetsch, & Thaler, 1986; Winer, 1986).

Unfortunately, no literature has been found concerning the respondents' process of forming willingness-to-pay in a real buying situation. It may, however, be hypothesized that in this case cost-based responses are less prevailing. People may perceive the personal

value much more important if they know they will actually acquire the good and are able to consume it. Additionally, the situational demand is likely to play a more important role than in the hypothetical context. According to economic theory, a rational decision-maker would trade off between the benefits and costs the good provides (Kirchler, 2003). Schkade and Pain (1994) noted that only very few actual trade-off statements were made in the hypothetical context. Similarly, Ajzen and Driver (1992) examined willingness-to-pay values for leisure activities and concluded that hypothetically stated willingness-to-pay judgments were probably not influenced by an activity's costs or benefits nor its anticipated or past utility. Rather the respondents relied on cognitive heuristics like the affect associated with the activities and on moral considerations. Moreover, Ajzen, Brown and Carvajal (2004) state that hypothetical and real contexts were construed very differently by the respondents. Only the real could activate strong normative beliefs, which affected the decision to contribute to a scholarship fund. Furthermore, 20% of the respondents in the study of Schkade and Payne (1994) confessed that they just made up a number or guessed at an answer. This behavior is probably less likely to appear in a BDM lottery due to the consequences of a decision.

In essence, whereas in the hypothetical question the focus is probably on finding a fair price or just a plausible price, the real situation may more strongly motivate people to consider their demand for the product. The calibration results of the literature where uncertainty statements were successfully used do not contradict this explanation. The objective of this study was to calibrate willingness-to-pay values, whereas preceding attempts focused on the number of people willing to buy. In this study willingness-to-pay was elicited by an open-ended question, which asked people to derive a value rather than a purchase decision.

In accordance with Völckner (2006a), further research should analyze the formation process of willingness-to-pay in general and in real purchase situations in particular, since this area is still relatively unexplored. Concerning willingness-to-pay measurement, it has been suggested that cost-based considerations, the occurrence of trade-offs as well as the

definition of the product may represent possible differences in the formation of real and hypothetical buying contexts. Furthermore, the contingent valuation literature often deals with public goods (e.g., Mitchell & Carson, 1990). For practical applications in the field of marketing it is, however, of primary interest to extend the already gained knowledge on private goods. Studies concerning the differences and similarities between these two categories would certainly be beneficial for the purpose of calibrating the contingent valuation measurements.

In conclusion, additional efforts are required for the realization of hypothetical forecasting. The relationship between the hypothetical measurement and the consumers' involvement, knowledge and preference uncertainty could not be validated. Using this approach, a calibration of hypothetical willingness-to-pay in order to forecast buyer behavior is not possible. Still, this study offers valuable managerial and research contributions. For practitioners, it has been shown that the usage of the contingent valuation currently represents an untrustworthy and risky measurement of willingness-to-pay. Its information does not exhibit enough validity for the derivation of pricing strategies and it is strongly advised to choose the more complex but more valid procedure of the BDM lottery. The research contribution of this study was the establishment of a connection between consumer characteristics and the willingness-to-pay elicitation. In addition, the consideration of practical concerns is seen as important contribution to the research on willingness-to-pay measurements. Although the set up hypotheses were not enough to explain the inaccuracy in respondents' hypothetical willingness-to-pay, they certainly provided a new perspective on hypothetical bias. Refinements and additions are necessary in order to achieve valid hypothetical forecasts of willingness-to-pay.

7 References

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8 Appendix

8.1 Price Response Functions

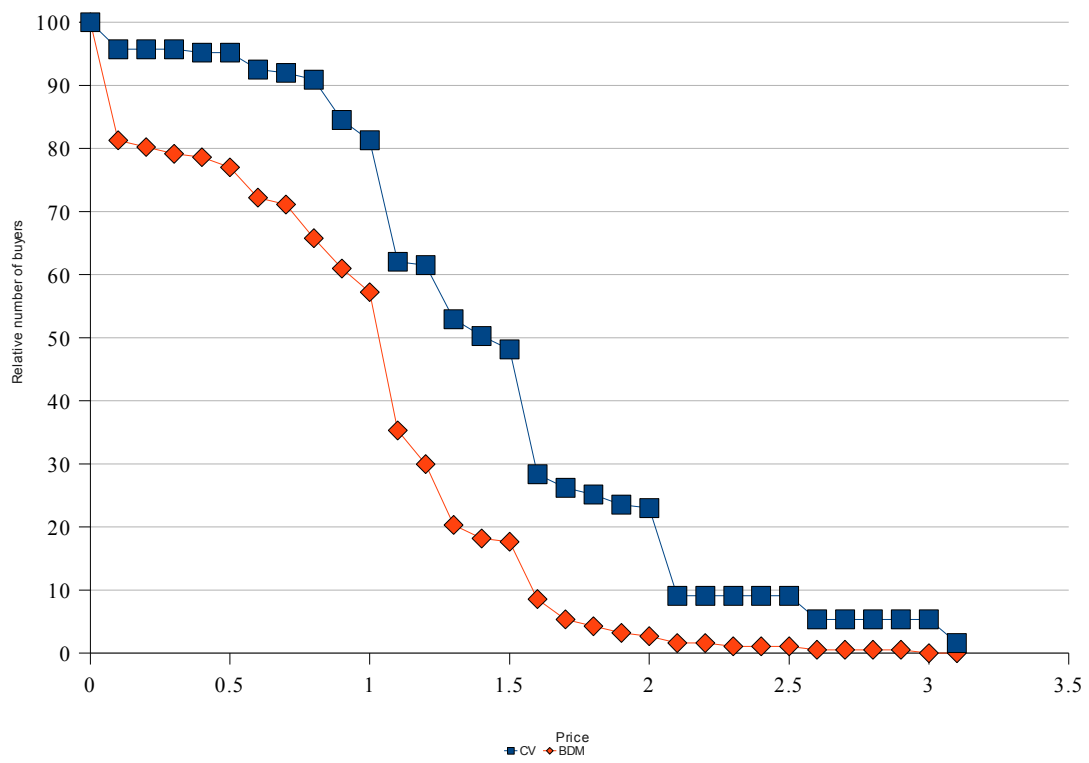


Figure 3: Price Response Function – Hachez, AIR

8.1 Price Response Functions

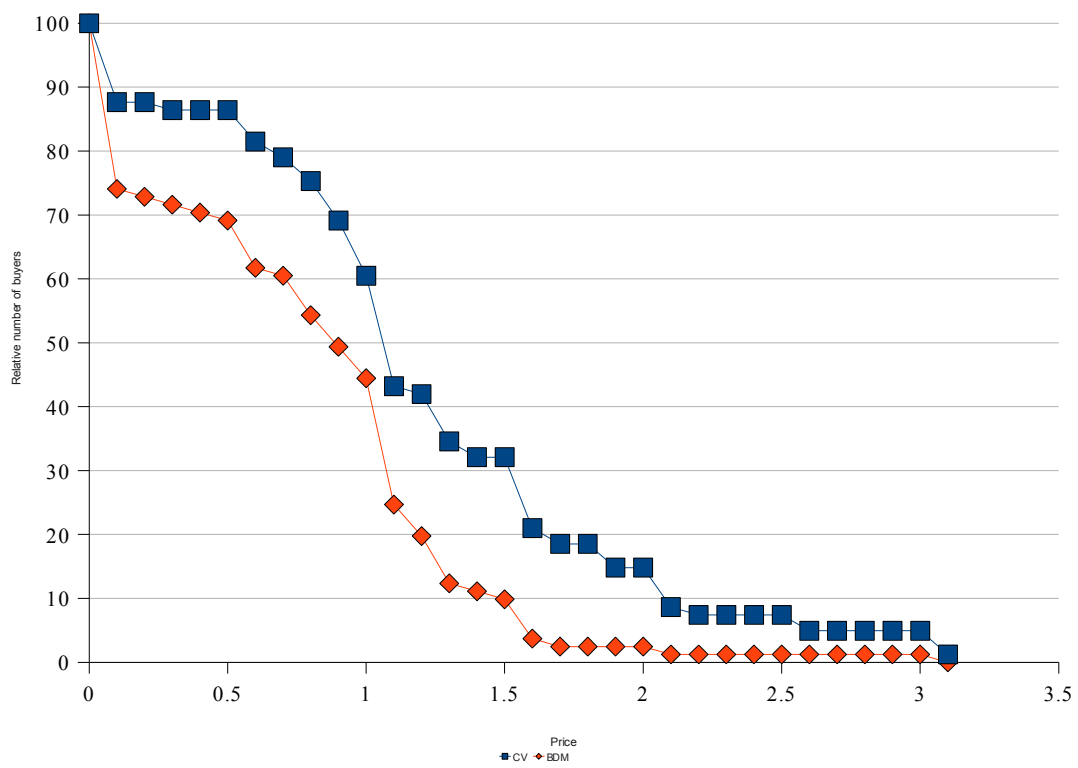


Figure 4: Price Response Function – Feodora, AIR

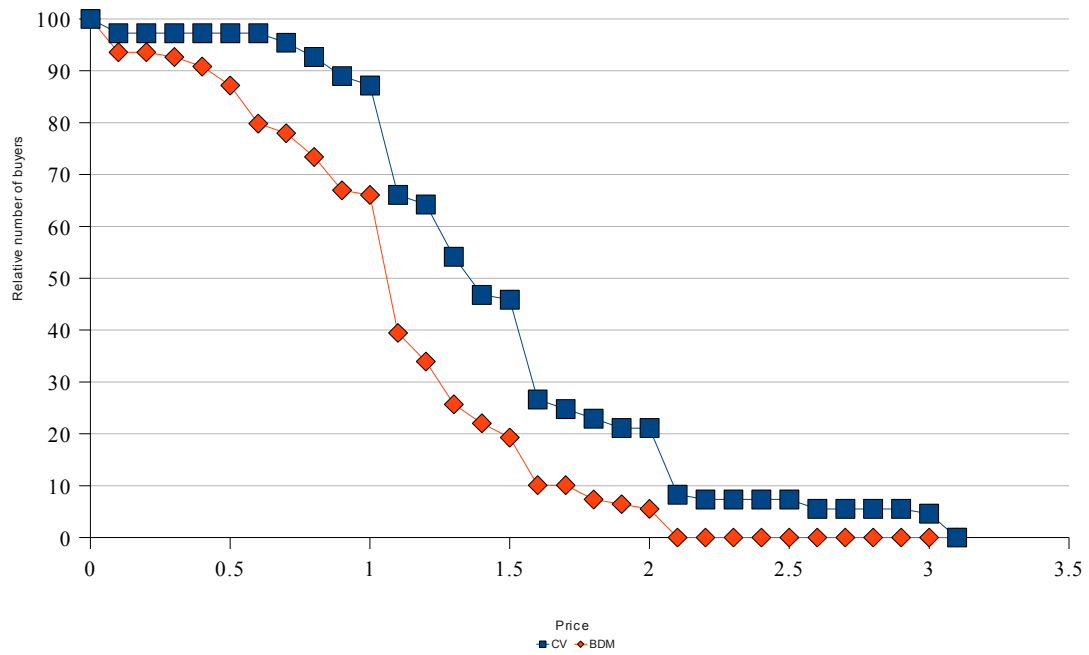


Figure 5: Price Response Function – Hachez, UNI

8.1 Price Response Functions

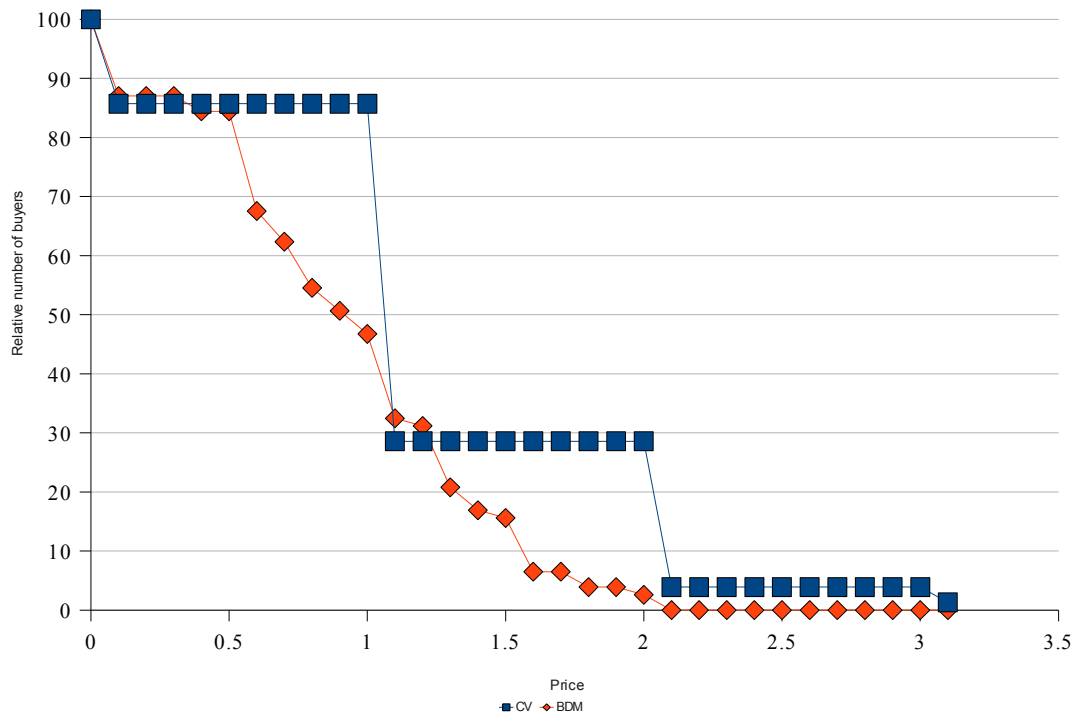


Figure 6: Price Response Function – Feodora, UNI

8.2 Model Fit of Price Response Functions

	CV – Feodora	BDM – Feodora	CV – Hachez	BDM – Hachez
Linear: $y = a + bx$				
a	58.15	59.82	180.22	160.62
b	-15.26	-25.39	-55.78	-68.75
R²	.75	.82	.87	.88
Multiplicative: $y = a \cdot b^x$				
a	96.47	110.35	402.44	417.91
b	0.33	0.16	0.25	0.12
R²	.93	.92	.96	.95

Table 7: Characteristics of Price Response Functions – AIR

	CV – Feodora	BDM – Feodora	CV – Hachez	BDM – Hachez
Linear: $y = a + bx$				
a	65.36	76.45	120.35	118.28
b	-20.52	-41.55	-44.94	-61.09
R²	.80	.97	.92	.95
Multiplicative: $y = a \cdot b^x$				
a	126.88	135.53	203.33	187.47
b	0.26	0.16	0.29	0.21
R²	.93	.91	.92	.90

Table 8: Characteristics of Price Response Functions – UNI

8.3 Abstract

Willingness-to-pay is defined as the amount somebody is willing to maximally spend on a certain good. The knowledge of consumers' willingness-to-pay is a prerequisite for companies to optimally price their products. In this regard, research revealed that even small price improvements have a significant impact on the profit. In order to quickly recognize price potentials and effectively exploit profit opportunities, it is invaluable to know how much people are going to pay for a product. This study deals with the practical implications of forecasting willingness-to-pay for companies as such forecasts allow a better planning of a product's pricing strategy.

Ideally, forecasts are accurate and flexible at the same time – requirements, which are difficult to meet for willingness-to-pay. A particular difficulty in the assessment of willingness-to-pay is related to the fact that people generally give a higher willingness-to-pay if they are simply asked about it rather than if the product is really sold to them. In the literature this overestimation phenomenon is known as hypothetical bias. This study tries to correct this error, which would enable practitioners to predict willingness-to-pay information faster and cheaper. In this regard, it has been shown that people with a higher certainty in their hypothetical willingness-to-pay judgment provided a more realistic willingness-to-pay than uncertain respondents. Hence, uncertainty appears to be an important factor in the predictability of real willingness-to-pay on the basis of stated values.

This study differentiates uncertainty in product performance uncertainty and preference uncertainty. Product performance uncertainty relates to the ability of a consumer to evaluate a product. The product evaluation is important for the determination of a willingness-to-pay, since willingness-to-pay is linked to one's personal value. The uncertainty related to the performance of a product is understood as a problem of missing information. More specifically, involvement and product knowledge are identified as important factors of efficiency and effectiveness in a consumer's decision making process. Involvement acts as a motivational element for the information processing whereas product knowledge is seen as the ability to process information. These two consumer characteristics are identified as

decisive sources of consumers' uncertainty in willingness-to-pay judgments due to their influence on the amount of utilized information. Both involved and knowledgeable consumers are supposed to state more realistic willingness-to-pay values in the hypothetical situation.

In addition, preference uncertainty implies that a consumer does not hold well-defined preference structures for a specific product category. For instance, he or she might be unsure whether to choose vanilla, chocolate or raspberry ice cream. This uncertainty in preferences makes the determination of willingness-to-pay more difficult and also leads to unstable answers. People who are certain about their preference are likely to be more certain about the amount willing to pay and thus respond more realistically in direct questions.

These hypotheses were tested by two within-group studies. Respondents were first asked for their willingness-to-pay towards a specific chocolate bar (hypothetical situation) and actually purchased this chocolate bar at their willingness-to-pay by participating a Becker-DeGroot-Marschak lottery (real situation). This lottery is so designed that participants have an incentive in revealing their true willingness-to-pay and is broadly accepted as particularly valid measurement method for willingness-to-pay. Additionally, each respondent's level of involvement, product knowledge and preference uncertainty was assessed.

In conclusion, a moderated regression could not find support for the elaborated theory. The proposed consumer characteristics did not significantly moderate the predictability of the hypothetically stated willingness-to-pay. Still, the overestimation of the hypothetical bias could be empirically proved. A possible explanation for the failure of the regression results is that consumers have different cognitive processes in the derivation of willingness-to-pay judgments between real and hypothetical contexts. These differences would make a comparison of “hypothetical” and “real” willingness-to-pay more difficult. Furthermore, a relationship indicating strategic behavior of knowledgeable respondents was found.

8.4 Abstract in German

Zahlungsbereitschaft ist definiert als jener Wert, den jemand bereit ist maximal für ein Produkt zu zahlen. Das Wissen von Zahlungsbereitschaften der Konsumenten ist für die Festsetzung von optimalen Preisen notwendig. Die wissenschaftliche Forschung zeigte, dass sich schon die kleinsten Veränderungen des Preises substantiell auf den Gewinn auswirken. Um rechtzeitig Preispotenziale zu erkennen und Preise effektiv zu gestalten, ist es von großer Bedeutung zu wissen, welchen Preis Konsumenten am Markt bereit sein werden zu zahlen. Diese Studie beschäftigt sich in erster Linie mit den praktischen Anforderungen Zahlungsbereitschaft vorherzusagen, um Unternehmen eine bessere Planung ihrer Preisstrategie zu ermöglichen.

Im Idealfall sind solche Vorhersagen sowohl genau als auch flexibel – Anforderungen, die für Zahlungsbereitschaft nicht leicht zu erfüllen sind. Eine besondere Schwierigkeit in diesem Zusammenhang ist die Tatsache, dass Befragte üblicherweise eine höhere Zahlungsbereitschaft nennen, wenn sie nur danach gefragt werden, als wenn sie tatsächlich für diese Zahlungsbereitschaft aufkommen müssen. In der Literatur wird dies als *hypothetical bias*, als eine hypothetische Verzerrung, bezeichnet. Diese Studie versucht diesen Meßfehler zu korrigieren, was ein schnelleres and kostengünstigeres Mittel zur Vorhersage von Zahlungsbereitschaft ermöglichen würde. In diesem Zusammenhang wurde festgestellt, dass eine überzeugte, sichere Abgabe einer Zahlungsbereitschaft eine bessere Vorhersage darstellte als eine unsichere Entscheidung. Daher wird der Unsicherheit eine zentrale Rolle in der Vorhersagbarkeit von realen Zahlungsbereitschaften auf der Basis von hypothetisch erfragten Zahlungsbereitschaften zugeschrieben.

Dabei wird die Unsicherheit in Unsicherheit gegenüber der Produktleistung und Unsicherheit gegenüber den eigenen Präferenzen unterschieden. Die Unsicherheit gegenüber der Produktleistung bezieht sich auf die Fähigkeiten ein Produkt zu beurteilen, was ein wichtiger Aspekt der Zahlungsbereitschaft darstellt, da diese den persönlichen Wert ausdrückt. Diese Unsicherheit wird als Problem fehlender Information verstanden. Das Involvement und das Produktwissen werden dabei als wichtige Einflussfaktoren für die Informations-

verarbeitung im Entscheidungsprozess gesehen. Während Involvement motivierend wirkt sich mit Informationen auseinanderzusetzen, stellt Produktwissen die Fähigkeit zur Verarbeitung von Informationen dar. Diese beiden Eigenschaften werden als wichtige Ursachen für Unsicherheit verstanden und es wird vermutet, dass sie die Vorhersagbarkeit von hypothetischen Zahlungsbereitschaften moderieren, indem sie sachkundige und daher sichere Entscheidungen bewirken.

Zusätzlich, bedeutet Unsicherheit der Präferenz, dass jemand nicht über ein gut ausgeprägtes Präferenzmuster verfügt. Zum Beispiel kann ein Entscheidungsträger unschlüssig sein, ob er oder sie lieber Vanille-, Schokolade- oder Erdbeereis kaufen soll. Diese Unsicherheit macht es schwierig eine Zahlungsbereitschaft abzuleiten, welche dann auch selten konstant bleibt.

Die aufgestellte Theorie wurde mittels zweier Studien überprüft. Die Versuchspersonen wurden zuerst über ihre Zahlungsbereitschaft für eine bestimmte Tafel Schokolade befragt (hypothetische Situation) und später wurde ihnen diese Tafel zu ihrer Zahlungsbereitschaft mit der sogenannten Becker-DeGroot-Marschak Lotterie verkauft (reale Situation). Diese Lotterie bietet den Teilnehmern einen Anreiz ihre wahre Zahlungsbereitschaft zu nennen und ist als eine der validesten Messmethoden anerkannt. Zusätzlich wurde das Involvement, das Produktwissen und die Unsicherheit der Präferenzen für Schokolade abgefragt.

Abschließend konnte eine moderierte Regressionsanalyse die Hypothesen zu den Moderatoreffekten der drei Eigenschaften nicht bestätigen. Die Vorhersagbarkeit wurde nicht im erwartendem Sinne beeinflusst. Jedoch wurde die Existenz der Verzerrung von hypothetisch abgegebenen Zahlungsbereitschaften deutlich bewiesen. Für das Fehlen von signifikanten Ergebnissen könnten Unterschiede in den Entscheidungsprozessen der Zahlungsbereitschaft in der hypothetischen und der realen Situation verantwortlich sein. Diese Unterschiede würden eine Verbesserung der Messergebnisse erschweren. Zusätzlich wurde ein Zusammenhang festgestellt, der auf strategisches Verhalten von Experten schließen lässt.

8.5 Curriculum Vitae

Angaben zur Person

Name: Stefan Schwaha
Geburtsdatum: 30.10.1983
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Wohnort: Wien

Ausbildung

Juni 2002 Matura am 3. BG/BRG Linz/Ramsauerstraße mit gutem Erfolg
2002-2003 Zivildienst beim Roten Kreuz Enns als Rettungssanitäter
2003 Studium der **Internationalen Wirtschaftswissenschaften** in Innsbruck
Seit 2004 Studium der **Internationalen Betriebswirtschaft** an der Universität Wien;
Spezialisierung in **International Marketing** und **Energie- und Umweltmanagement**

Praktische Tätigkeiten

Sommer 2004 VAI SIAS in Paris: Uebersetzung, Erstellung von Informationsmaterial, Recherchen
Sommer 2005 VAMED in Wien in der Abteilung Marketing and Sales: Bewertung der Attraktivität osteuropäischer Märkte, Recherche zur Kundenbetreuung
Sommer 2007 Albertina Museum in Wien: Aufsicht
Frühjahr 2007- Winter 2008 Quantitative und qualitative Marktstudien im Rahmen des Kurses Marketing Research: Brand Equity, Brand Positioning Effectiveness, "Internet am Handy" für T-Mobile und Research International, Globale versus lokale Marken, Auswirkungen des „Made in EU“ Labels auf die Zahlungsbereitschaft

Sprachen

Englisch (fließend)
Französisch (sehr gut)
Spanisch (Grundkenntnisse)
Italienisch (Grundkenntnisse)

Besondere Kenntnisse

sehr gute Computerkenntnisse (Office, Linux, SPSS, Bildbearbeitung)
Malereikurse an der Künstlerischen Volkshochschule, Wien
Teilnahme an der Sommerakademie für Bildende Kunst in Salzburg, Malereiklasse Irina Nakhova (Sommer 2006)
Absolvierung eines privaten Filmkurses
Führerschein A, B