

Satisfaction and Repurchase Behavior in a Business-to-Business Setting: Investigating the Moderating Effect of Manufacturer, Company and Demographic Characteristics

Marcel Paulssen

Assistant Professor for Industrial Marketing Management, Humboldt-University of Berlin
Spandauerstr. 1, 10178 Berlin, Germany
paulssen@wiwi.hu-berlin.de

Matthias M. Birk

PhD-student in marketing, Humboldt-University of Berlin
Spandauerstr. 1, 10178 Berlin, Germany
birk@wiwi.hu-berlin.de

Abstract

Customers have been shown repeatedly to defect even though they state to be highly satisfied. This has led some researchers to generally question the use of satisfaction surveys. Other Researchers have been able to successfully identify problems concerning the link between satisfaction and retention. One is, that *how* satisfaction translates into retentive behaviour depends on certain customer characteristics. However, those studies have been equivocal and left several questions unanswered, above all how the satisfaction-retention link may differ for customers of different brands or manufacturers. Also studies investigating the role of company characteristics in a business-to-business setting have been lacking. We address both issues by investigating moderating variables of the satisfaction-retention link of business customers of several different manufacturers in two different European countries. Our results provide clear evidence that previously found moderating effects of customer characteristics are manufacturer specific. Clearly this may be the reason why previous results have been difficult to reconcile. Further we can show that in a business-to-business setting company characteristics are important moderators in addition to the previously investigated role of demographics as moderating variables.

Keywords: Satisfaction-retention link, moderator effects, business-to-business relationships

Introduction

Achieving high customer satisfaction has become an important focus of corporate strategy for most firms (Homburg, Koschate and Hoyer 2005; Honomichl 1993). The underlying assumption being that satisfied customers repurchase more than unsatisfied customers. However many executives seem to trust primarily their intuitive sense that high customer satisfaction will translate into higher loyalty and with it ultimately into improved company performance (Homburg, Koschate and Hoyer 2005). In fact, "Despite the claim that satisfaction ratings are linked to repurchase behavior, few attempts can be found that relate satisfaction ratings to actual repurchase behaviour" (Mittal and Kamakura 2001, p. 131). Some researches have even gone as far as to question the usefulness of satisfaction measures in general (e.g. Reichheld 2003). In a dramatic illustration of the problem Reichheld (1996) reports that while around 90% of industry customers report to be satisfied or even very satisfied, only between 30% to 40% actually repurchase. Clearly current knowledge fails to explain fully the prevalence of satisfied customers who defect and dissatisfied customers who do not (Bendapudi and Berry 1997; Ganesh, Arnold, and Reynolds 2000; Jones and Sasser 1995; Keaveney 1995).

Apparently "the response function linking [...] satisfaction to customer response may not operate as is frequently assumed because the complexity of the relationship may be underestimated" (Oliva, Oliver and MacMillan 1992). Mittal and Kamakura (2001) propose that the link connecting satisfaction to actual repurchase behaviour may be difficult to observe in satisfaction surveys if satisfaction ratings vary because of differences in customer characteristics. Some studies have since studied moderating variables of the satisfaction-retention link. Homburg and Giering (2001) used a cross-sectional design to analyse the moderating effects of consumer characteristics on the satisfaction-loyalty link in a business-to-consumer context. They measured satisfaction with the product, the sales process and the after sales service, as well as recommendation and purchase intentions. Variety seeking, age and income were found to be important moderating variables: customers high on variety seeking exhibited a weaker, customers with high income a stronger link between satisfaction and loyalty. Old customers showed a stronger link of satisfaction with the product and loyalty, whereas younger customers exhibited a stronger link between satisfaction with the sales process and loyalty. Moderating effects of gender and involvement could only partially be validated. Several problems in interpretation however arise through the use of a satisfaction measure and an intentional measure of loyalty in the same survey: common-method variance may have inflated the relationship. Mazursky and Geva (1989) found that satisfaction and intentions were highly correlated when measured at the same time but had no correlation when measured at two different points in time. Additionally both ratings may be influenced by the same response bias thereby leading to spurious correlations (Arnold, Feldman, and Purbhoo 1985; Zedeck, Kafry, and Jacobs 1976). Subsequently, Mittal and Kamakura (2001) and Seiders et al. (2005) found significant differences between repurchase behaviour and repurchase intentions. Despite these problems, "Many empirical studies examining direct and moderated satisfaction-repurchase effects measure repurchase intentions rather than objective repurchase behavior" (Seiders et al. 2005, p. 25).

A more elaborate investigation of the role of moderating effects was presented by Mittal and Kamakura (2001) as they measured actual repurchase behaviour as well as repurchase intentions. They further developed a model in which they were able to identify systematic differences in satisfaction thresholds and response biases. The concept of satisfaction thresholds can explain why customers with the same satisfaction ratings may vary systematically in their repurchase behavior: because customers have different tolerance levels toward repurchase that are not fully captured in their satisfaction ratings. At the same satisfaction level, customers with lower thresholds are more likely to repurchase. Mittal and Kamakura found that females have lower thresholds than males, older customers have lower thresholds than younger customers, customers with only high-school education have lower thresholds than customers with higher education and customers without children have lower thresholds than customers with children. Response bias conveys the notion that satisfaction ratings may not be solely influenced by the true satisfaction level but may be inflated or deflated. Mittal and Kamakura found that the response bias is higher for females than for males, meaning that repurchase behaviour is relatively invariant to changes in satisfaction ratings for females compared to males. Especially at the lower end of the scale, representing dissatisfaction, a change in ratings was uncorrelated with repurchase-behaviour for female customers. Customers without children evidenced higher biases at both ends of the scales than customers with children. Also Customers of higher age as well as customers with lower education level

showed higher response biases. Based on those characteristics Mittal and Kamakura were able to identify a group for which repurchase behaviour and reported satisfaction level were virtually uncorrelated, thereby revealing the possible magnitude of response bias on satisfaction ratings. Making a strong point for the importance of behavioural measures of intentions the authors could further show that this bias would not have been discernable using repurchase intentions.

Seiders et al. (2005) have investigated moderating effects of the satisfaction-retention link looking at repurchase visits, repurchase spending and repurchase intentions separately. They found involvement to positively moderate the satisfaction-repurchase spending link but not the satisfaction-repurchase visits link: high involvement enhanced the relationship. However they also found that involvement negatively moderates the satisfaction- repurchase intention link and conclude that low involvement customers tend to overestimate the impact of their satisfaction on their repurchase behaviour. Household income significantly positively moderated the satisfaction-repurchase visits link and the satisfaction-repurchase spending link but not the satisfaction-repurchase intentions link: satisfaction translates better into repurchase behaviour for wealthier customers than for others. However, results have been partially equivocal: "Although prior research points to several variables that may moderate the satisfaction repurchase relationship, empirical results are equivocal and difficult to reconcile" (Seiders et al. 2005, p. 26). And the understanding of the moderating constructs is still limited " Further, research on moderating variables has left several questions unanswered. To the best of our knowledge all prior research investigating moderating variables of the satisfaction-retention link has looked at customers of one company respectively. Brand or manufacturer has never been looked at as a potential moderator of the satisfaction-retention link. Thus it may well be that the partially equivocal findings of previous research are due to the fact, that results are brand/manufacturer specific: "the effect of consumer characteristics is most likely industry- and/or category-specific" (Mittal and Kamakura 2001, p. 133). Furthermore, investigations of moderating variables in a business-to-business context have been lacking. Hence, characteristics that are specific to the business-to-business context have not yet been investigated as moderating variables, such as company characteristics of the buying firm: "organizational characteristics of the buying firm as well as relational characteristics of the buyer – supplier relationship might have a strong moderating influence on the relationship between satisfaction with a supplier and loyalty" (Homburg and Giering 2001, p. 59). In order to investigate whether moderating effects of customer characteristics are brand/manufacturer specific an investigation of moderating variables of the satisfaction-retention link has to look at customers of different brands/manufacturers. Further, in order to investigate company characteristics of the buying firm as moderators of the satisfaction-retention link an investigation in a business-to-business context is necessary.

Model Development

In order to provide those missing bricks, we will thus investigate moderating variables in a business-to-business context of customers of different manufacturers. We will build on a model developed by Mittal and Kamakura (2001) who proposed two mechanisms by which customers can introduce variability into the satisfaction retention link: satisfaction thresholds and response bias.

Satisfaction Threshold

Customers may vary systematically in their tolerance levels or thresholds toward repurchase that are not fully captured in their satisfaction ratings. A satisfaction threshold can be interpreted as a "reservation value" (Mittal and Kamakura 2001 p. 134), i.e. the value that is associated with the customer's next best alternative other than repurchasing. This evaluation will not only be based on the satisfaction with the prior manufacturer but also the expected satisfaction with other manufacturers. Thus a customer with a lower "reservation value" or low satisfaction threshold will be more likely to repurchase at the same satisfaction level as a customer with a higher "reservation value" and better alternatives.

Demographic characteristics: as Mittal and Kamakura (2001) could show, the satisfaction threshold or reservation value may differ for customers with different demographic characteristics. They suggested for example, that older customers may be more likely to remain loyal to a brand due to their accumulated

investments in and knowledge about the brand, whereas younger customers may in contrast be more willing to search for information and thus switch brands.

Company characteristics: in addition we would expect company characteristics, e.g. branch of industry to have a differential impact on the satisfaction threshold in a business-to-business context: A small branch of industry with a specific demand is likely to have less alternatives to choose from than a large industry with a less specific demand. Thus in that example, the reservation value for the small branch of industry should be lower. Moreover threshold effects of demographic and company characteristics can also be moderated by manufacturer. Assume that a certain manufacturer offers a product that is better able to serve specific needs of a certain industry or customers of a certain age group than those of competitors. These customers will have a lower reservation value / lower thresholds than customers who do not desire those specific features.

Manufacturer / brand: we further propose that customers of different manufacturers will differ on their existing alternatives and their evaluation: e.g. customers of a high-quality manufacturer A placing high value on product-quality and good service will certainly evaluate existing alternatives differently from customers of a medium-quality manufacturer B placing high emphasis on low price. If the remaining manufacturers compete on price, the reservation value and therefore the satisfaction threshold for customers of manufacturer A would be high but this fact would have no impact on the satisfaction threshold of other customers. Thus given equivalent satisfaction levels, customers of manufacturer A would be more likely to repurchase than customers of manufacturer B.

Response Bias

Satisfaction ratings may not be solely influenced by the true satisfaction level but are error prone measures of a true latent satisfaction. Ratings may be too easy or too harsh compared to customers' true satisfaction (Arndt and Crane 1975; Dwyer 1980; Kalwani and Silk 1982). This can be explained by differences in consumer socialization (see Zuckermann 1981) and role theory (see Hoffman and Hurst 1990) that may predispose some consumers to engage in "yes-saying" more than others.

Demographic characteristics: as Mittal and Kamakura (2001) have shown. response bias may be due to differences in socialization. For example to generation differences older customers might be more likely to generally engage in yes-saying when asked to rate their satisfaction.

Company characteristics: we would not expect company characteristics to influence response bias as we cannot think of a rationale explaining why variables like branch of industry would influence how easy or harsh a customer rates on a satisfaction scale.

Manufacturer: in addition we assume that this will vary for different manufacturers: e.g. a customer of a premium manufacturer might be a harsher rater due to higher expectation towards the product than a customer of a low-cost manufacturer. Additionally it could be possible that the response bias of demographics is moderated by manufacturer. That is, how harsh a consumer of a certain age group rates may depend on his expectations towards the product and could be manufacturer specific.

In the following we will formulize the above proposed: the probability that a customer J with a latent (true) satisfaction level S_J repurchases is equal to the probability that his or her true satisfaction is greater than a given threshold μ_J :

$$P[Y_J = 1 (= \text{repurchase})] = P[S_J > \mu_J] \quad (1)$$

We assume the threshold μ_J to vary with demographic characteristics Z_{Jk} , company characteristics C_{Jt} , the manufacturer M_J and the interactions of Z_{Jk} and C_{Jt} with M_J . The threshold is therefore regressed on the demographic and company characteristics, manufacturer and their interactions:

$$\mu_J = \gamma_0 + \sum_{k=1}^K \gamma_{zk} Z_{Jk} + \sum_{t=1}^T \gamma_{ct} C_{Jt} + \gamma_{ml} M_{Jl} + \sum_{k=1}^K \gamma_{zmk} Z_{Jk} M_{Jl} + \sum_{t=1}^T \gamma_{cmt} C_{Jt} M_{Jl} + \eta_J \quad (2)$$

where η_J is a Gumbel-distributed random error, γ_0 describes the influence of factors independent of differences in thresholds due to demographic, company characteristics and manufacturer, γ_{zk} the influence of demographic characteristics, γ_{ct} the influence of company characteristics and γ_m the influence of the choice of the previous manufacturer; γ_{zmk} describes the influence of the interaction of demographic characteristics and manufacturer and γ_{cmt} the influence of the interaction of company characteristics and the manufacturer. This threshold defines the true satisfaction level necessary for the consumer to be indifferent between switching or repeating the brand.

The observed satisfaction rating O_J is an indicator of the true underlying satisfaction S_J , therefore we regress the latent satisfaction on this indicator:

$$S_J = \beta_J O_J + \varepsilon_J \quad (3)$$

where ε_J is a Gumbel distributed random error and β_J is the response bias, representing the translation of true satisfaction into observed satisfaction ratings. As noted above, we assume that the response bias depends on demographics, manufacturer and their interaction:

$$\beta_J = \delta_0 + \sum_{k=1}^K \delta_{zk} Z_{Jk} + \sum_{k=1}^K \delta_{zmk} Z_{Jk} M_J + \delta_{ml} M_{Jl} \quad (4)$$

where δ_0 describes the influence of demographic, company characteristics and manufacturer, δ_{zk} response bias due to demographic characteristics and δ_m the response bias due to manufacturer. δ_{zmk} describes the influence of the interaction between response bias due to demographics and manufacturer. By combining these, we arrive at the following formula where the difference between the independent and identically Gumbel-distributed random errors η_J and ε_J is logistically distributed:

$$P[Y_J = 1] = P \left[\eta_J - \varepsilon_J < \left(\left(\delta_0 + \sum_{k=1}^K \delta_{zk} Z_{Jk} + \delta_{ml} M_{Jl} + \sum_{k=1}^K \delta_{zmk} Z_{Jk} M_J \right) O_J - \gamma_0 - \sum_{k=1}^K \gamma_{zk} Z_{Jk} - \sum_{t=1}^T \gamma_{ct} C_{Jt} - \gamma_{ml} M_{Jl} - \sum_{k=1}^K \gamma_{zmk} Z_{Jk} M_J - \sum_{t=1}^T \gamma_{cmt} C_{Jt} M_J \right) \right] \quad (5)$$

Method and Results

We investigated repurchases of commercial vehicles in a business-to-business setting. Several manufacturers compete in this market and the customers of a commercial vehicle manufacturer may rely on different vendors and change the allocation of purchase shares according to the record of performance. The data is part of two surveys of new commercial vehicle buyers in the German and the British market. All relevant manufacturers of commercial vehicles in those two markets participated in this survey and provided data of customers they have surveyed when they have purchased (a) new vehicle(s). Only respondents who were participating in the purchase decision were eligible for the survey. In our model we only investigated straight repurchases where a commercial vehicle was actually replaced by a vehicle with the same specifications. Thus purchases where an additional vehicle was bought (fleet expansion) or a commercial vehicle was replaced by a vehicle with different specifications or from a different category (e.g. passenger vehicle, estate vehicle, truck) were excluded, because for these type of purchases other factors than the satisfaction with the previous vehicle are likely to impact the purchase decision. In order to ensure that the data adequately represented the actual market situation data was weighted by vehicle registration data of the respective market and year.

Study 1

In the German market 2324 respondents of the original 4997 respondents conducted a straight

replacement repurchase of a commercial vehicle and therefore remained for analysis. In order to conduct a logistic regression a listwise deletion had to be carried out, 1695 cases remained after Listwise deletion. The following characteristics were surveyed:

Demographic characteristics: sex, age and consideration of other manufacturers (whether other manufacturers than that of the replaced vehicle prior to purchase were considered)

Company characteristics: branch of industry, number of employees, fleet size (commercial vehicles), average length of vehicle ownership (for the whole fleet).

manufacturer previous (manufacturer of the replaced commercial vehicle) was collapsed to three categories (in order to have sufficient cell sizes), the first two representing two major German manufacturers and the third containing the rest.

Satisfaction with the replaced vehicle was measured on a Likert-scale ranging from 1 = “completely dissatisfied” to 5 = “completely satisfied”. When the replacement vehicle was bought from the same manufacturer a customer was considered to be loyal.

Table 1: Sample Characteristics of the German CV-market

Variables			Percentage	Average Satisfaction Rating	Percentage Re-purchasing
Demographic characteristics	Sex	Male	87,8%	3,67	65,8%
		Female	12,2%	3,70	67,8%
	Age	18-35 years	23,9%	3,61	58,3%
		36-45 years	33,6%	3,60	64,5%
		46-55 years	24,7%	3,72	68,5%
		56 years and more	17,8%	3,86	76,2%
	Consideration of further manufacturers	Yes	56,2%	3,60	56%
No		43,8%	3,78	79%	
Company characteristics	Branch	Manufacturing Industry	9,4%	3,65	66,3%
		Retail	14,9%	3,62	65,9%
		Construction/Handcrafts	50,7%	3,67	66,3%
		Service	17,8%	3,73	65,4%
		Else	7,2%	3,77	65,5%
	Number of employees	1-9	51,9%	3,67	66,1%
		10-50	36,2%	3,71	64,3%
		51 and more	11,9%	3,61	71,5%
	Fleet size (commercial vehicles)	1	33%	3,70	65,9%
		2-9	56,5%	3,66	65,1%
		10-	10,6%	3,71	71,8%
	Average length of ownership (in years)	-3	37,2%	3,64	74,6%
		4-7	40,6%	3,58	61,6%
8 and more		22,2%	3,91	59,9%	
Manufacturer previous	Mercedes-Benz	21,5%	3,64	56%	
	Volkswagen	38,8%	3,93	79%	
	Other	39,6%	3,45	66,1%	

First of all we checked whether different demographic and company characteristics had a significant main effect on customer satisfaction using ANOVA. We find significant mean differences for two of the demographic characteristics, namely *age* ($F=4.68$; $p=0.00$) and *consideration of further manufacturers* ($F=12.25$; $p=0.00$), one company characteristic *average length of ownership* ($F=11.68$; $p=0.00$) and *manufacturer previous* ($F=37.77$; $p=0.00$).

We used logistic regression analysis to predict repurchase. Logistic regression also allows for analysis of non-linear relationships that may exist. Specifically we conducted a stepwise logistic regression and estimated seven different models. The Information Criterion (AIC) which penalizes less parsimonious models was used for model selection (Akaike, 1974). The best fitting model is the one with the smallest

AIC. In model one (AIC = 1,405) we included only satisfaction as independent variable. Although becoming significant, the model containing satisfaction alone hardly does a better job at correct classification (67,3%) than the model containing only the constant (66,1%). In model two we included all possible main effects (demographic characteristics, company characteristics and manufacturer) (AIC = 1,307). In model three threshold effects (main effects in terms of the model) moderated by manufacturer (AIC = 1,292) were included. Response bias effects (interaction with satisfaction in terms of the model) for demographics and manufacturer were included in model four (AIC = 1,308). In model five we subsequently included also the moderated response bias effects of demographics by manufacturer were additionally included in model four, resulting in our proposed model. This model resulted in the best model fit with the smallest AIC-value (-2log-likelihood = 1791,82; Nagelkerkes $R^2 = 0,278$; AIC = 1,287). In order to test our proposition, that company characteristics would not have a significant influence on response bias we estimated two further models, additionally containing response bias effects of company characteristics in model six (AIC = 1,295) and also the moderated response bias of company characteristics by manufacturer in model seven (AIC = 1,298). Both models resulted in higher AIC values. Thus data fits our proposed model and subsequently model five was therefore retained and interpreted.

Table 2: Model iterations Germany

Variables	Chi-square	df	Sig.	Delta	Sig.	-2log-likelihood	Nagelkerke R Square	Percentage correct predicted	AIC
Constant								66,10%	
SAT	76,191	1	0,00			2095,465	0,061	67,30%	1,405
SAT, DEM, COM, MAN	255,711	18	0,00	179,520	0,00	1915,945	0,194	71,80%	1,307
SAT, DEM, COM, MAN, DEM*MAN, COM*MAN	339,136	48	0,00	83,425	0,00	1832,52	0,251	72,80%	1,292
SAT, DEM, COM, MAN, DEM*MAN, COM*MAN, SAT*DEM, SAT*MAN	348,409	55	0,00	9,273	0,234	1823,247	0,257	72,7	1,308
SAT, DEM, COM, MAN, DEM*MAN, COM*MAN, SAT*DEM, SAT*MAN, SAT*DEM*MAN	379,836	65	0,00	31,427	0,00	1791,82	0,278	74,40%	1,287
SAT, DEM, COM, MAN, SAT*DEM, SAT*MAN, SAT*COM, DEM*MAN, COM*MAN, SAT*DEM*MAN	388,611	75	0,00	8,775	0,554	1783,045	0,284	74,50%	1,295
SAT, DEM, COM, MAN, SAT*DEM, SAT*MAN, SAT*COM, DEM*MAN, COM*MAN, SAT*DEM*MAN, SAT*COM*MAN	423,487	95	0,00	34,879	0,021	1748,169	0,306	75,00%	1,298

SAT=Satisfaction, DEM = Demographics, COM=Company Characteristics, MAN= Manufacturer

Thresholds: in terms of the model estimates satisfaction thresholds are captured by the main effects of company, demographic characteristics, and manufacturer (γ parameters in the model). Negative coefficients indicate higher thresholds compared to the reference category. Further the interactions of manufacturer with company and demographic characteristics can be interpreted as thresholds moderated by manufacturer¹. Of all demographic characteristics only *consideration of other manufacturers* had a significant effect. Further, *number of employees*, *length of ownership* and *manufacturer previous* significantly affect the threshold. Customers considering more than one manufacturers show a higher satisfaction threshold (hence a lower repurchase probability with equivalent levels of satisfaction) than

¹ For reasons of space tables containing coefficients for all variables cannot be reported here. They can however be requested from the authors.

those considering only one manufacturer ($\gamma_{z6} = -1,7063, p < .01$). Companies with 10-50 employees have a significantly higher threshold than companies with more employees ($\gamma_{c6} = -0,9781, p < .01$). Companies that hold their commercial vehicles for a short term (on average up to three years) evidenced a significantly lower satisfaction threshold (thus higher repurchase probability with equivalent levels of satisfaction) ($\gamma_{c7} = 0,7690, p < .01$), than companies holding their commercial vehicles longer. Customers whose previous vehicle was from Volkswagen, evidenced a significantly higher threshold than customers of other manufacturers ($\gamma_{m2} = -7,1667, p < .01$). Apparently Volkswagen has a less loyal customer base than other manufacturers.

Figure 1: Differential Satisfaction threshold of length of ownership

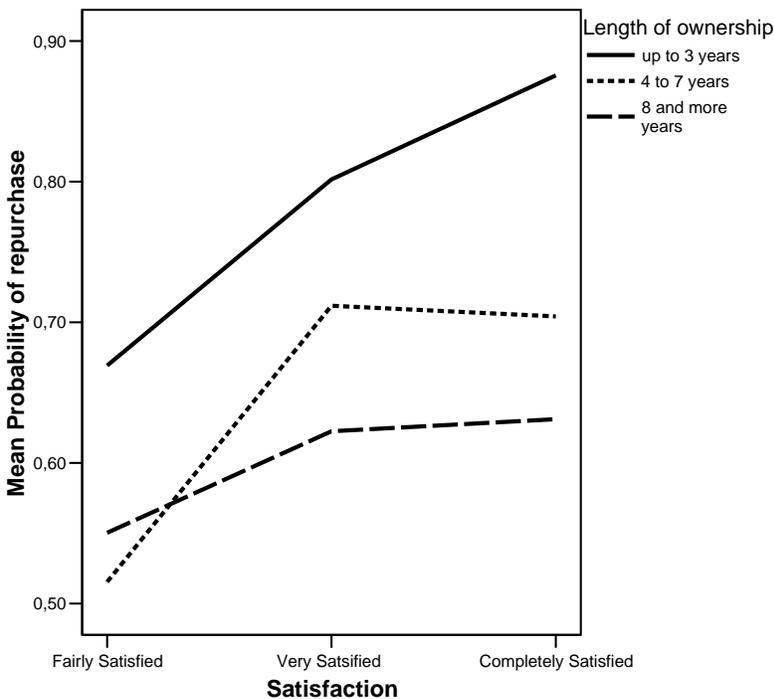


Figure 1 exemplarily gives a graphical depiction of the differential threshold effect of length of ownership. Graphically differences in satisfaction thresholds manifest in differences in elevation. It becomes apparent that customers who keep their vehicles for a shorter period of time have lower satisfaction thresholds: at the same satisfaction level customers with shorter lengths of ownership have a higher probability of repurchase than customers with an average longer length of ownership. For better comprehensibility only the three highest categories are shown here, as the least two together contain less than 15% of the cases.

Whereas *age* does not show a significant threshold effect on its own, it significantly influences the threshold when moderated by manufacturer. Mercedes-Benz customers who are between 18 to 35 years old have a significantly higher threshold ($\gamma_{zm1} = -5,1298 p < .01$) than older customers. This effect however can not be found for other manufacturers. This stands in line with findings of Mittal and Kamakura (2001) who found that older customers have lower satisfaction thresholds. The same can be found for *branch of industry*: no differential effect can be found if the manufacturer variable is neglected however it becomes clear from Table 5 that thresholds differ significantly for different branches of industry if the manufacturer is taken into account. The threshold effect of *length of ownership*, it appears is again moderated for manufacturers: whereas Figures 4a-c show a strong threshold effect of *length of ownership*, the analysis on manufacturer level shows, that this effect only holds true for Volkswagen, not however for Mercedes-Benz or other manufacturers.

Figure 2a: Differential satisfaction thresholds of length of ownership for Mercedes-Benz customers

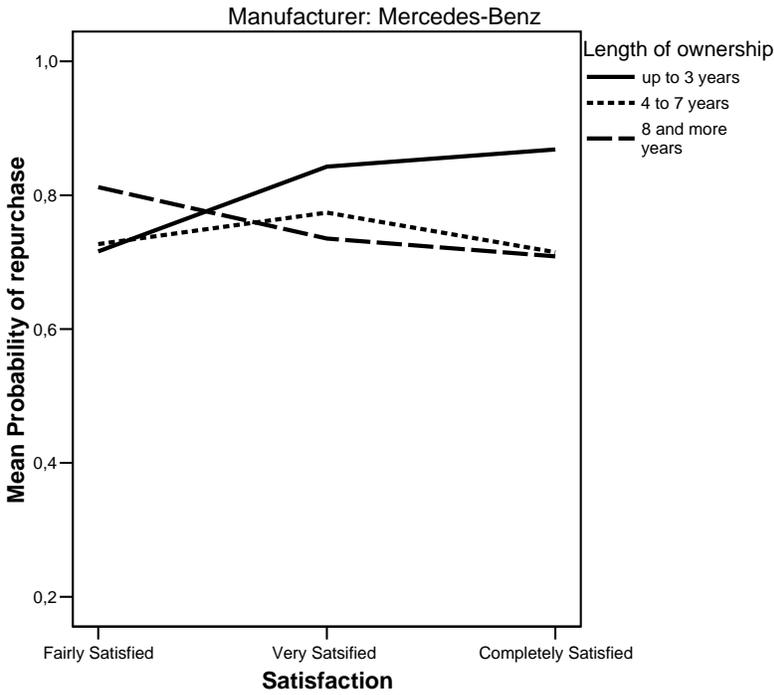


Figure 2b: Differential satisfaction thresholds of length of ownership for Volkswagen customers

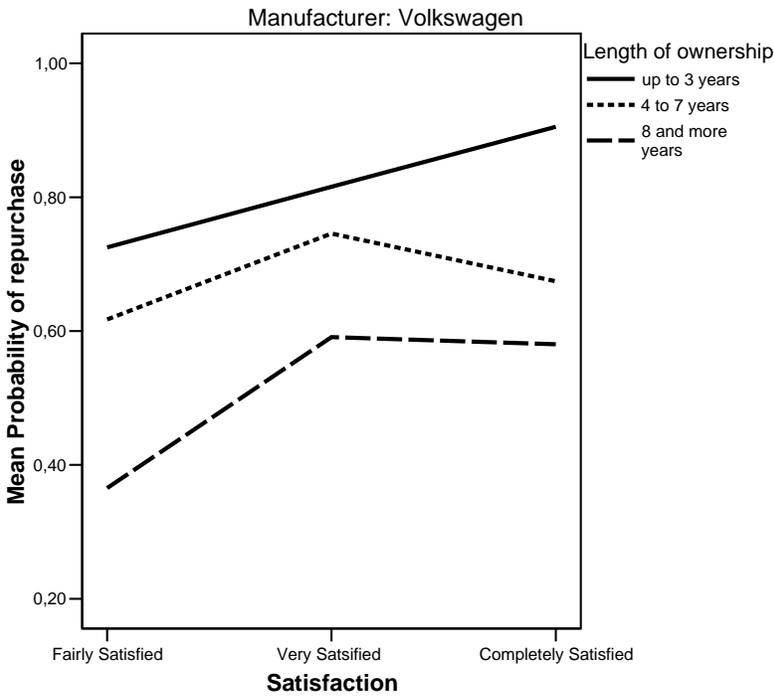
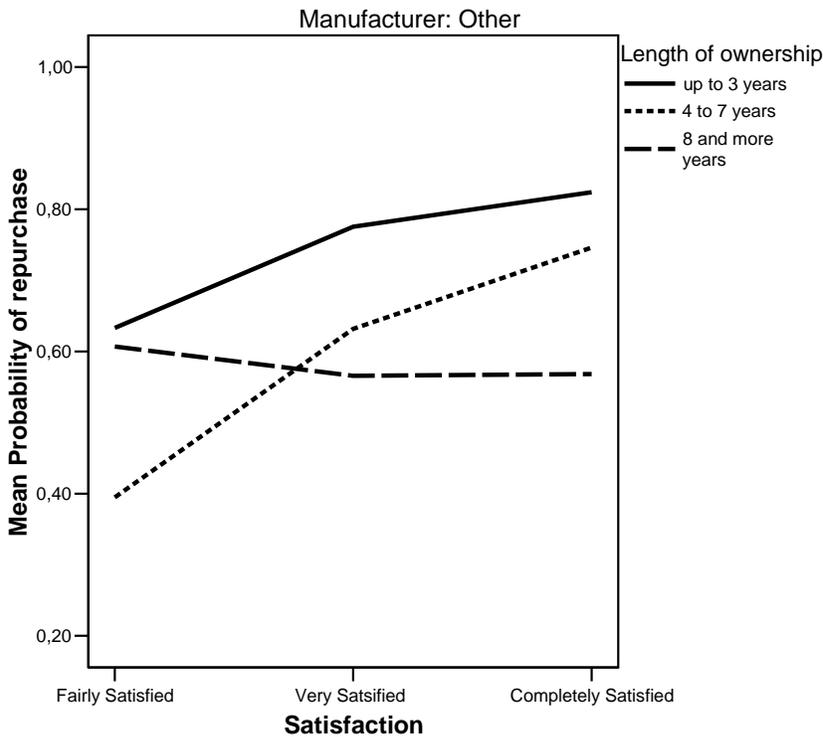


Figure 2c: Differential satisfaction thresholds of length of ownership for other customers



Figures 2a-c graphically depicted the differential impact of length of ownership for customers of different manufacturers. The importance of taking manufacturer into analysis becomes apparent: a general inspection of moderating effects has shown that customers with a lower length of ownership have a lower satisfaction threshold and hence a higher intrinsic retainability. An inspection on a manufacturer specific level however shows that this holds true only for customers of Volkswagen, not so for customers of Mercedes-Benz.

Response bias: in terms of the model estimates the response bias is captured by the interactions between satisfaction ratings and the demographics, respectively satisfaction ratings and manufacturer (δ parameters) implying that even after accounting for the differences in average rating, the translation of reported satisfaction into repurchase depends on demographic characteristics and manufacturer. Negative coefficients indicate higher response bias compared to the reference category. Not a single demographic characteristic in our model shows a significant response bias effect on its own, only *manufacturer* has a significant response bias effect ($p < .05$).

The fact that no single demographic has a effect on response bias is particular striking as all of them evidence significant effects on response bias when moderated by manufacturer. For young customers (18 to 35 years) the response bias is lower, meaning that changes in their satisfaction ratings strongly translate into repurchase for this age group only for Mercedes-Benz ($\delta_{zm1} = 1,3581$; $p < .01$) whereas there is no significant difference in response bias due to age for other manufacturers.

Figure 3a: Differential response bias effect of age for Mercedes-Benz customers

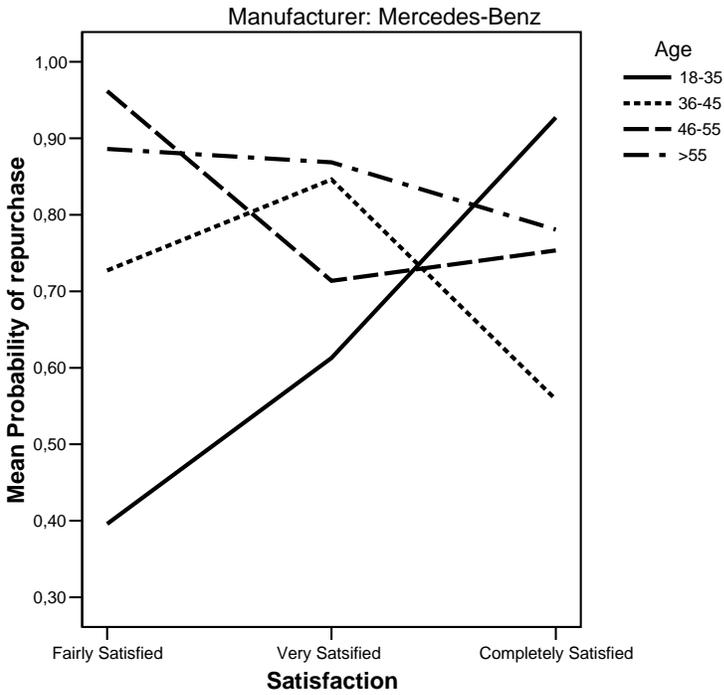


Figure 3b: Differential response bias effect of age for Volkswagen customers

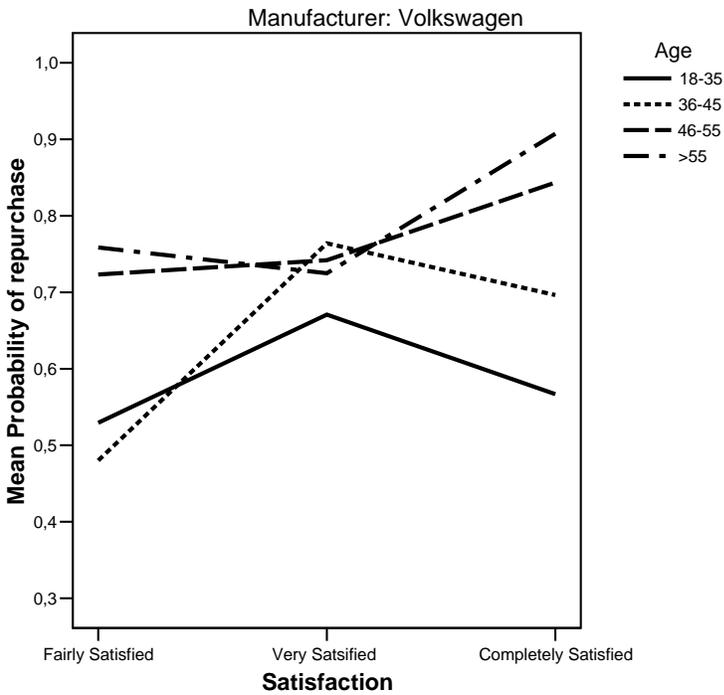
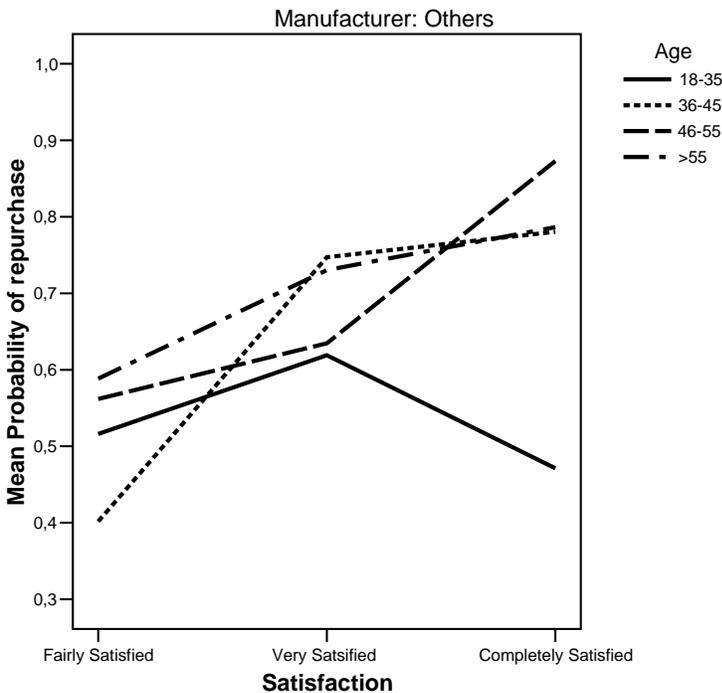


Figure 3c: Differential response bias effect of age for other customers



It can be seen clearly from figure 3a that differences in satisfaction ratings translate better into repurchase behavior for younger customers than for other customers. Apparently response bias is stronger for older customers than for younger. However this is only the case for customers of Mercedes-Benz. Younger customers of other manufacturers do not show a lesser response bias than older customers. Similarly differential effects of response bias for manufacturers can be found for *sex* ($p = .007$) and *consideration of other manufacturers* ($p = .0425$). There is an overall significant response bias effect of *sex* moderated by *manufacturer*. Customers of Volkswagen who consider more than one manufacturer show a significantly higher response bias (meaning their satisfaction ratings translate less well into repurchase behavior) than customers who only consider one manufacturer ($\delta_{zm11} = -0,6788$; $p < .0,0176$). The translation of satisfaction ratings into repurchase behavior for customers of Mercedes-Benz and other manufacturers however does not differ with *consideration of other manufacturers*.

Study 2

Study 2 was conducted for validation purposes. 2744 commercial vehicles customers were surveyed in the British market, using the same survey as in the German market (in an translated version). 1211 of the surveyed customers conducted straight repurchases. As in the German sample all the relevant manufacturers in the British market participated. After listwise deletion, necessary to conduct a logistic regression, 598 cases remained for further analysis. 364 of those customers had previously purchased a Ford, the largest category, but only 84 customers had previously purchased a Vauxhall, the second largest category. As in our model we investigate three-way interactions containing manufacturer (to estimate moderated response bias and moderated threshold) choosing three manufacturer categories (as done in study 1), here for Ford (as the largest category), Vauxhall (as the second largest category) and other manufacturers would have resulted in too small cell sizes and thus abnormally high standard errors due to too little cases for Vauxhall. Hence we estimated the model with only two manufacturer categories, Ford and all other manufacturers. Apart from that we used the same categories as in study 1. Table 2 shows the sample characteristics of study 2.

Table 2: Sample Characteristics of the British commercial vehicle market

Variables			Percentage	Average Satisfaction Rating	Percentage Re-purchasing
Demographic characteristics	Sex	Male	94,8	3,97	59,0
		Female	5,2	3,74	45,2
	Age	18-35 years	24,5	3,84	60,3
		36-45 years	39,1	3,99	55,1
		46-55 years	27,5	4,01	57,6
		56 years and more	9,0	4,17	68,5
	Consideration of further manufacturers	Yes	92,0	3,95	56,7
No		8,0	4,22	75,0	
Company characteristics	Branch	Manufacturing Industry	10,7	3,83	62,5
		Retail	19,1	3,96	50,0
		Construction/Handcrafts	30,0	4,07	62,0
		Service	30,1	4,14	63,3
		Else	10,2	3,37	44,3
	Number of employees	1-9	47,6	4,00	59,3
		10-50	41,1	4,00	59,8
		51 and more	11,3	3,73	49,3
	Fleet size (commercial vehicles)	1	40,3	4,04	57,3
		2-9	44,7	3,94	58,4
		10-	15,0	3,87	61,1
	Average length of ownership (in years)	-3	43,1	3,78	61,6
		4-7	41,2	4,00	53,0
8 and more		15,7	4,43	62,8	
Manufacturer previous	Ford	60,8	4,01	68,1	
	Other	39,2	3,92	43,0	

Conducting several analyses of variance, we find significant mean differences for *branch of industry* ($F=6,648$; $p=0.00$) as well as for *average length of ownership* ($F=12,836$; $p=0.00$). As in study 1 we estimated several models using logistic regressions for study 2. Results are presented in table 3.

Table 3: Model iterations British market

Variables	Chi-square	df	Sig.	Delta	Sig.	-2log-likelihood	Nagelkerke R Square	Percentage correct predicted	AIC
Constant								58,3	
SAT	53,348	1	,000			759,735	,115	65,9	1,341
SAT, DEM, COM, MAN	112,962	17	,000	59,613	,000	700,122	,232	71,6	1,292
SAT, DEM, COM, MAN, DEM*MAN, COM*MAN	153,325	32	,000	40,364	,000	659,758	,304	71,5	1,274
SAT, DEM, COM, MAN, DEM*MAN, COM*MAN, SAT*DEM, SAT*MAN	177,375	38	,00	24,049	,001	635,709	,257	72,2	1,253
SAT, DEM, COM, MAN, DEM*MAN, COM*MAN, SAT*DEM, SAT*MAN, SAT*DEM*MAN	184,995	43	,000	7,620	,178	628,089	,358	72,3	1,257
SAT, DEM, COM, MAN, DEM*MAN, COM*MAN, SAT*DEM, SAT*MAN, SAT*DEM*MAN	207,272	53	,000	22,278	,014	605,811	,394	75,7	1,253

SAT*COM,									
SAT, DEM, COM, MAN, DEM*MAN, COM*MAN, SAT*DEM, SAT*MAN, SAT*DEM*MAN SAT*COM, SAT*COM*MAN	223,960	63	,000	16,688	,082	589,124	,420	74,9	1,259

SAT=Satisfaction, DEM = Demographics, COM=Company Characteristics, MAN= Manufacturer

As in study 1, including the threshold effects into the model (AIC = 1,292) significantly increased model fit compared with the naive model containing satisfaction only (AIC = 1,341). Including the moderation effect of manufacturer and satisfaction thresholds further significantly increased the model fit (AIC = 1,292). Adding the moderated threshold effects by manufacturer in turn increased model fit (AIC = 1,274). Including the response bias of demographic characteristics and manufacturer (the interaction with satisfaction in terms of the model) significantly increased the model fit and resulted in the model with the lowest AIC-value (AIC = 1,274). Model six, additionally containing the three way interaction satisfaction-demographics-manufacturer resulted in the same AIC-value however, in this case the more parsimonious model is chosen. Model five, containing the three way moderated response bias effect did not lead to a better fit than model four (AIC = 1,257), the same with model seven (AIC = 1,259). Contrary to study one, the moderation of the response bias effects thus did not improve model fit. Thus model four containing threshold effects for company, demographic characteristics and manufacturer, response bias effects for demographic characteristics and manufacturer and moderated threshold effects of demographic and company characteristics was retained for further analysis.

Looking at the main effects, which represent the thresholds in our model, only company characteristics significantly impact the thresholds, namely *number of employees* ($p=.045$) and *length of ownership*. As can be seen in figure 4, customers holding their vehicle for less than three years have significantly lower thresholds than customers keeping their vehicles for longer. This finding goes along with findings about the effect of length of ownership in study 1. Further the threshold effect of *length of ownership* ($p=.013$) and *number of employees* ($p=.012$) is moderated by manufacturer.

Figure 4: differential satisfaction threshold of length of ownership

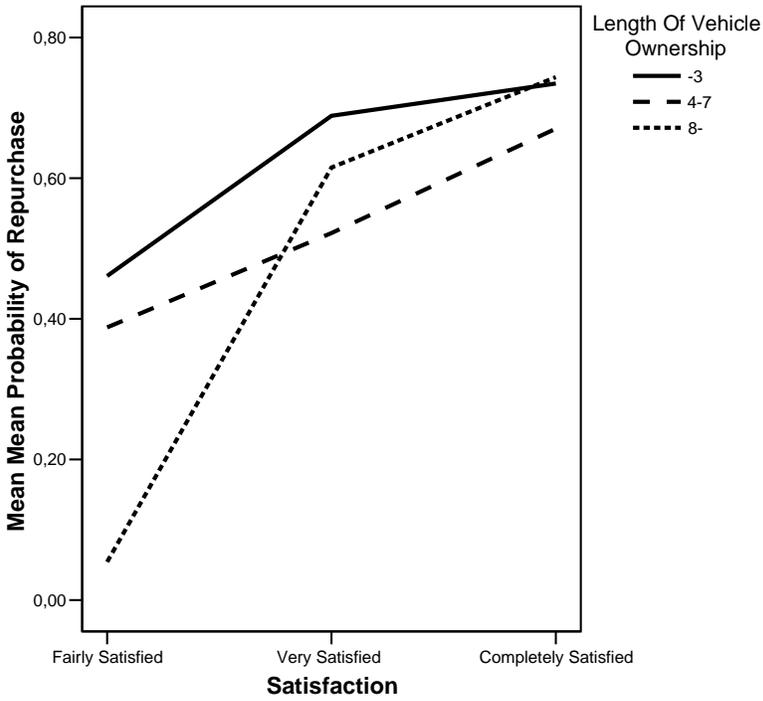


Figure 4a: Satisfaction threshold effect of number of employees for Ford customers

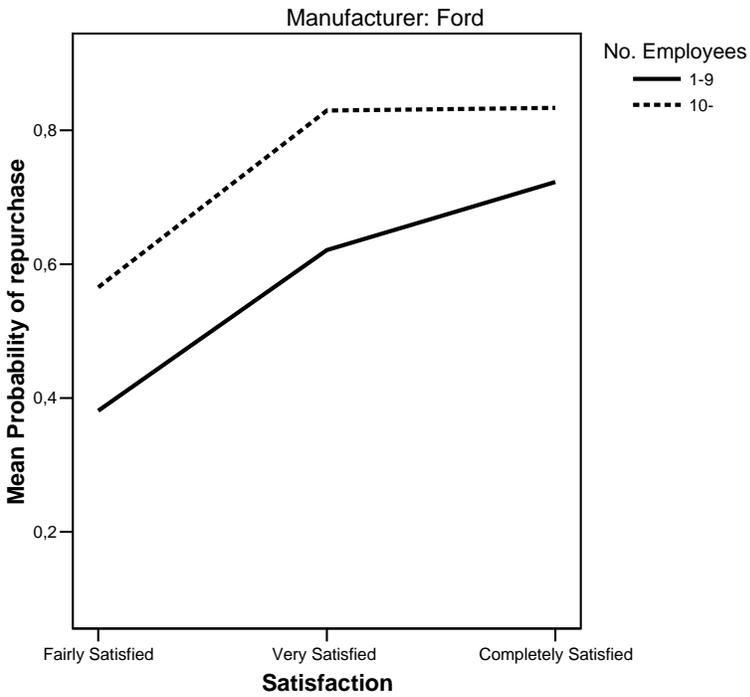
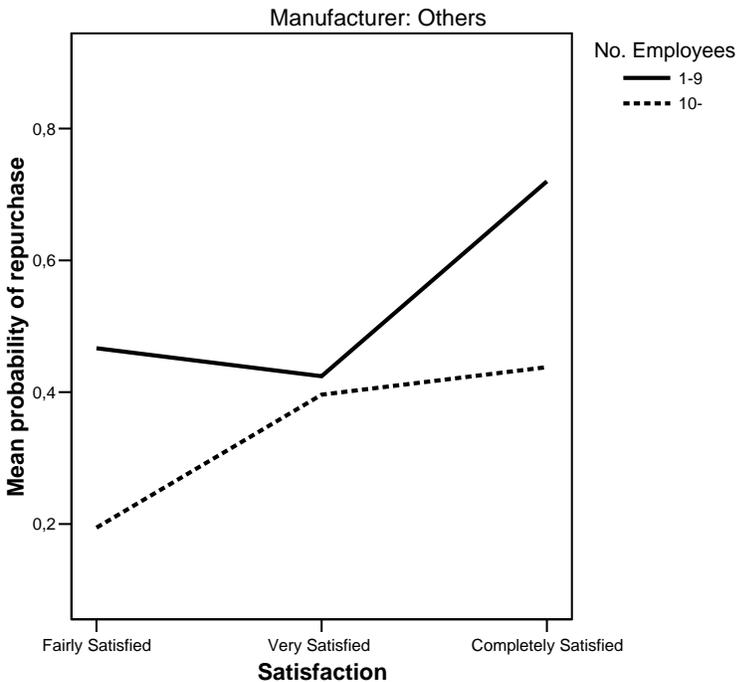


Figure 4b: Satisfaction threshold effect of number of employees for other customers



Figures 4a and 4b illustrate the differential effect of number of employees on the satisfaction thresholds for the different manufacturers. There are no significant response bias effects of demographic characteristics or manufacturer that can be reported. Summarizing the results from study 2 do not replicate all the findings from study 1, since moderated response bias did not significantly improve model fit for the data in study 2 and no significant coefficients for manufacturer and demographic characteristics could be found. However two of the three major findings of study 1 could be replicated in study 2. First, company characteristics show a moderating influence in a business-to-business setting. Second, moderating effects can vary significantly for different manufacturers, as it was the case for 'number of employees' in study 2. The third important finding from study 1, that manufacturer alone significantly impacted satisfaction threshold and response bias could not be replicated, this may however be due to the fact that sample size did not allow for more than two manufacturer categories.

Discussion

Previous studies have investigated customer characteristics as moderating effects of the satisfaction-retention link. However those studies have neglected the potential moderating role of brand / manufacturer. Authors have acknowledged that previous findings have been difficult to reconcile (Seiders et al. 2005) and that results may have been industry specific (Mittal and Kamakura 2001). In spite of this, previous studies have ignored to investigate the role of brands or manufacturers on moderator effects of the satisfaction-retention link. Further authors have acknowledged that company characteristics of the buying firm are likely to moderate the satisfaction-retention link (Homburg and Giering 2001). However also those have not been empirically investigated. Consequently our study aimed at investigating the moderating role of manufacturer and company characteristics.

In order to do this we built on a model developed by Mittal and Kamakura (2001) and expanded by the role of manufacturer and company characteristics. We investigated commercial vehicle customers of all the relevant manufacturers in the German market. First of all we found, that demographic, company characteristics and manufacturer all have a significant influence on the satisfaction threshold, demographics and manufacturer a significant influence on response bias effects. Further, we found that

both, the effect of demographic- and company characteristics depend largely on the manufacturer. As Steenkamp and Baumgartner (1998) have stressed the need to validate models developed in one country, in other countries as well, we conducted a validation study of our model in the British market. The investigation in the second study lent support to our model. Although results from study 1 could not be replicated exactly, we were able to replicate main findings. Moderating variables of customers can be manufacturer specific. Great care should thus be paid when generalizing findings of the moderating role of demographic characteristics on the satisfaction retention link from one manufacturer / brand to another. For example, whereas Mittal and Kamakura (2001) found that older customers have a lower threshold than others, we could show that the effect of age on satisfaction threshold varies for different manufacturers. Thus our results may provide the missing link as to why previous studies have been difficult to reconcile.

Managerial Implications

Identifying manufacturer specific satisfaction thresholds and response bias may provide useful to managers for various reasons: manufacturer-specific customer groups defined by certain demographics or company characteristics with low thresholds can be viewed as inherent loyal customers. They can also be seen as a shelter from competition to other manufacturers as those customers apparently see few alternatives other than to repurchasing from the manufacturer even when their satisfaction is low. Such customers represent a constant source of revenue and may be ideally suited for testing new ideas. Such results can further be used for customer value models, as researchers have stressed the importance of identifying inherently loyal customers. However, as our results show, managers cannot rely on general findings about moderating characteristics but are well advised to tap into their own customer base. Apart from identifying satisfaction thresholds of one's own customer base, identifying customers with high satisfaction thresholds of key competitors' may also provide valuable insight. Those customers should be the most volatile and the most easy to specifically target when entering a new segment or placing a new product.

Research on the high defection rate of satisfied customers has left managers with an irritation about how to interpret satisfaction surveys or if to conduct them at all (see Reichheld 2003). "They tend to be long and complicated, yielding low response rates and ambiguous implications that are difficult for operating managers to act on" (Reichheld 2003, p. 47). Identifying customer specific response biases' may help managers to better interpret satisfaction survey results. Questions like "for what customers do changes in satisfaction ratings translate into changes in repurchase behavior?" are extremely relevant for managers. Managers may then want to monitor satisfaction of those customers more closely than satisfaction of others.

Limitations and future research

Why do certain customer or company characteristics positively impact on satisfaction thresholds and response bias whereas others impact negatively? And why does a certain characteristic impact on the response bias for one manufacturer but not for another? It seems not feasible to provide a solid theory for those differences and thus we did not derive hypotheses and hence also abstained from providing ex-post explanations of why certain characteristics impacted on the satisfaction-threshold in a certain way. The selection of our sampled and investigated characteristics as well as our the selection of categories may thus seem arbitrary from a theoretical viewpoint. However we did not aim at providing and testing a theory of *why* certain characteristics impact on the satisfaction-retention link in a certain way but at showing that moderating effects are manufacturer specific and that company characteristics have to be taken into account in business-to-business contexts.

One may criticize, that we did not use a longitudinal design as is desirable in investigations of the business-to-consumer setting. However constructing a longitudinal design where satisfaction and repurchase are measured at two different points in time is difficult to impossible in a business-to-business setting for one reason: contrary to the business-to-consumer context, in a business-to-business context a

high number of vehicles are purchased over time. Asked at one point of time to give a satisfaction rating with a specific vehicle, it will be hard to impossible for a customer to specify at a different point in time if that exact same vehicle was replaced with one of the same or another manufacturer as a dozens of new vehicles may have been purchased in the elapsed time. In order to assure a clear link between satisfaction and retention we thus decided to measure satisfaction with the previous vehicle when a specific replacement had taken place. Nevertheless we are aware that this may have led to an inflated relation of the investigated satisfaction retention link, as cognitive dissonance theory would predict customers who actually repurchased to give higher and others to give lower satisfaction ratings (see Festinger 1957). However the influence of satisfaction alone on repurchase was low anyhow, and rose only by incorporating further variables.

References

- Akaike, Hirotugu (1974), "Markovian representation of stochastic-processes and its application to analysis of autoregressive moving average processes," *Annals of the Institute of Statistical Mathematics*, 26(3), 363-387.
- Arndt, Johan and Edgar Crane (1975), "Response Bias, Yea-Saying, and Double Negative," *Journal of Marketing Research*, 12(2), 218-220.
- Arnold, Hugh J., Daniel C. Feldman and Mary Purbhoo (1985), "The Role of Social-Desirability Response Bias in Turnover Research," *Academy of Management Journal*, 28(4), 955-966.
- Bendapudi, Neeli and Leonard L. Berry (1997), "Customers' motivations for maintaining relationships with service providers," *Journal of Retailing*, 73(1): 15-37.
- Dwyer, F. Robert (1980), "Response errors in survey-research," *California Management Review*, 23(1), 39-45.
- Festinger, Leon (1957), *A theory of cognitive dissonance*. Stanford, CA: Stanford University Press.
- Ganesh, Jaishankar, Mark J. Arnold and Kristy E. Reynolds (2000), "Understanding the customer base of service providers: an examination of the differences between switchers and stayers," *Journal of Marketing*, 64 (July), 65-87.
- Hoffman, Curt and Nancy Hurst (1990), "Gender stereotypes: perception or rationalization," *Journal of Personality and Social Psychology*, 58 (February), 197-298.
- Homburg, Christian and Annette Giering (2001), "Personal characteristics as moderators of the relationship between customer satisfaction and loyalty – an empirical analysis," *Psychology & Marketing*, 18(1), 43-66.
- Homburg, Christian, Nicole Koschate and Wayne D. Hoyer (2005), "Do satisfied customers really pay more? A study of the relationship between customer satisfaction and willingness to pay," *Journal of Marketing*, 69(2), 84-96.
- Honomichl, Jack (1993), "Spending on customer satisfaction continues to rise," *Marketing News*, April 12, 17-18.
- Jones, Thomas O. and W. Earl Sasser (1995), "Why satisfied customers defect," *Harvard Business Review*, 73(6), 88-99.
- Kalwani, Manohar U. and Alwin J. Silk (1982), "On the reliability and predictive validity of purchase intention measures," *Marketing Science*, 1(3), 243-286.
- Keaveney, Susan M. (1995), "Customer Switching Behavior in-Service Industries - an Exploratory-Study," *Journal of Marketing*, 59(2): 71-82.
- Mazursky, David and Aviva Geva (1989), "Temporal Decay in Satisfaction-Purchase Intention Relationship," *Psychology & Marketing*, 6(3), 211-227.
- Mittal, Vikas and Wagner A. Kamakura (2001), "Satisfaction, repurchase intent, and repurchase behavior: investigating the moderating effect of customer characteristics," *Journal of Marketing Research*, 38(1), 131-142.
- Oliva, Terence A., Richard L. Oliver and Ian C. MacMillan (1992), "A catastrophe model for developing service satisfaction strategies," *Journal of Marketing*, 56(3), 83-95.

Reichheld, Frederick (1996), "Learning from customer defections," *Harvard Business Review*, 74(2), 56-69.

Reichheld, Frederick (2003), "The one number you need to grow," *Harvard Business Review*, 81(12), 46-57.

Steenkamp, Jan-Benedict and Hans Baumgartner (1998), "Assessing measurement invariance in cross-national consumer research," *Journal of Consumer Research*, 25(1): 78-90.

Seiders, Kathleen, Glenn B., Voss, Dhruv Grewal and Andrea L. Godfrey (2005), "Do satisfied customers buy more? Examining moderating influences in a retailing context," *Journal of Marketing*, 69(4), 26-43.

Zedeck, Sheldon, Dista Kafry and Rick Jacobs (1976), "Format and scoring variations in behavioural expectation evaluations," *Organizational Behavior and Human Performance*, 17 (October), 171-84.

Zuckermann, Diana M. (1981), "Family background, sex-role attitudes, and life goals of technical college and university students," *Sex Roles*, 7, 1109-1126.