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The impact of satisfaction and payment equity on cross-buying: A dynamic model for a multi-service provider

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Abstract

In the last decade, marketers have primarily focused on keeping customers. Only recently have they become aware that creating value by cross-selling additional services is also an important aspect of customer relationship management. In this article we investigate how satisfaction and payment equity, defined as the perceived fairness of the price, affect cross-buying at a multiservice provider. We also consider its competitors' performance on these factors. Our results show that the effect of satisfaction differs between customers with lengthy and short relationships. It also shows that payment equity negatively affects cross-buying for customers with long relationships. However, if the prices of the supplier are perceived as fairer than the prices of the competitor, the customers' probability of cross-buying increases. © 2001 by New York University. All rights reserved.

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1. Introduction

Recently, managers have acknowledged that retaining customers is not sufficient to be successful. With the new millenium, many are seeking to enhance the value of their customers by expanding the range of products and services they buy from the firm (Blattberg

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& Deighton, 1996; Rust, Zeithaml & Lemon, 2000). This goal has sparked a growing interest in how this goal may be achieved. In order to retain customers, managers have focused primarily on satisfaction. However, does satisfaction also create more value by leading consumers to cross-buy more products or services? The role of price discounts has also come under fire. For example, while customers for one product line may be initially attracted by low prices, can such buyers be profitably attracted to other goods and services offered by the firm?

These questions are especially relevant for multiservice providers. The value of a customer of a multiservice provider depends on: (1) the duration of the provider-customer relationship (length of relationship), (2) the usage level of the consumed services (depth of the relationship), and (3) the number of different services bought from the same provider (breadth of the relationship). For these companies, customer retention by itself is not fully responsive to the goal of value creation.

Recently, Bolton (1998) and Bolton, Kannan and Bramlett, (2000) studied the influence of satisfaction on the length of the relationship, while Bolton and Lemon (1999) and again Bolton, Kannan and Bramlett, (2000) studied the effect of satisfaction and payment equity on the depth of the relationship. We adopt the Bolton and Lemon, (1999, p.173) definition of payment equity as the customers' perceived fairness of the price paid for each service.

However, neither these nor other studies examined the effect of either of these measures on cross-buying. Such evaluations are typically based on their currently purchased services. Whether this intelligence will aid in the determination of cross-buying opportunities is not clear as other services may have demand determinants such as price elasticities and favored product attributes. A positive evaluation of a currently purchased service does not imply a comparable interest in others. Depending on the consistency among the services provided by the firm, the impact of satisfaction and payment equity on cross-buying might be different from their effect on the length and depth of a relationship.

For example, the effect of a customer's comparison with a competing supplier, usually called *regret*, see Inman, Dyer & Jia, 1997, has recently been included in satisfaction models. Bolton, Kannan and Bramlett, (2000) report that this comparison has a significant effect on usage and customer retention. This may be of major importance for cross-buying. As more alternatives are considered, the effect of competition may become more important. The extent to which this premise holds depends on the character, consistency and degree of competition among the services offered by the supplier. As additional services are added to the decision, cross-buying is likely to become a more elaborate decision process relative to retention and usage decisions.

In this research we seek to extend the literature by addressing the following two issues:

- Do satisfaction and payment equity with a multiservice provider affect cross-buying?
- Do differences in satisfaction and payment equity between the focal supplier and a competitor affect cross-buying?

The organization of this article is as follows. In Section 2 we present our model and hypotheses. We discuss the research design, the data and the statistical method in Section 3 and describe our results in Section 4. Finally, in Section 5 we summarize our findings and discuss management implications, research limitations and suggestions for further research.

2. Model and hypotheses

2.1. Background for the model

2.1.1. Theory

We build our model on the satisfaction research literature (e.g., Bolton, 1998; Bolton & Lemon, 1999) and from subjective utility theory (e.g., Oliver & Winer, 1987). We assume that each customer maximizes his or her subjective utility obtained from the services provided by a multiservice provider. As is usually done in the customer satisfaction literature, we assume that this expected, subjective-utility depends primarily on his/her current satisfaction and price perceptions (see Bolton, (1998) among others). Thus, in the decision to purchase additional services, customers consider their assessment of the provided service quality and the price of the service. As a consequence of this complex decision process, customers will compare these assessments with their perceptions of the service quality and price of competitors (Bolton, Kannan & Bramlett, 2000). We assume that perceptions of service quality are reflected in satisfaction, while perceptions of price are reflected in the construct of payment equity.

Cross-buying will also be affected by other factors. In particular, customer needs are unlikely to be comparable across the range of services offered by a firm. A good insurance customer, for example, may receive cross-offers for a mortgage on his or her home. However, if the current mortgage has already been paid off, the customer has no need for this product and there will be no reply to this offer. To capture these disparate needs, it is important to have a more extensive understanding of the socio-demographic characteristics of the consumer (Kamakura, Ramaswami & Srivastava, 1991) to capture the effect of the range customer needs across multiple products.

The impact of a diverse set of needs may also play out differently with respect to such marketing instruments as loyalty programs.

2.1.2. Conceptual model

Our model is displayed in Fig. 1. This model is dynamic as cross-buying typically occurs between two moments in time. As discussed above, this model assumes that both satisfaction and payment equity affect cross-buying. In addition, we also consider how relationship length moderates these effects. The rationale for this moderating effect is that customers with lengthy relationships have more confidence in their satisfaction and payment equity evaluations (Bolton, 1998; Rust et al., 1999). Moreover, customers may also become more value-oriented over time (Reinartz & Kumar, 2000).

Besides the main effects of satisfaction and payment equity, this model assumes that customers will also consider the difference in performance between the supplier and the competitor for these factors in their cross-buy decision. Finally, we assume that marketing instruments, socio-demographics and past behavior will be related to cross-buying. These variables are included as covariates. We note that past behavior might capture an inertia effect (Rust, Lemon & Zeithaml, 2000).

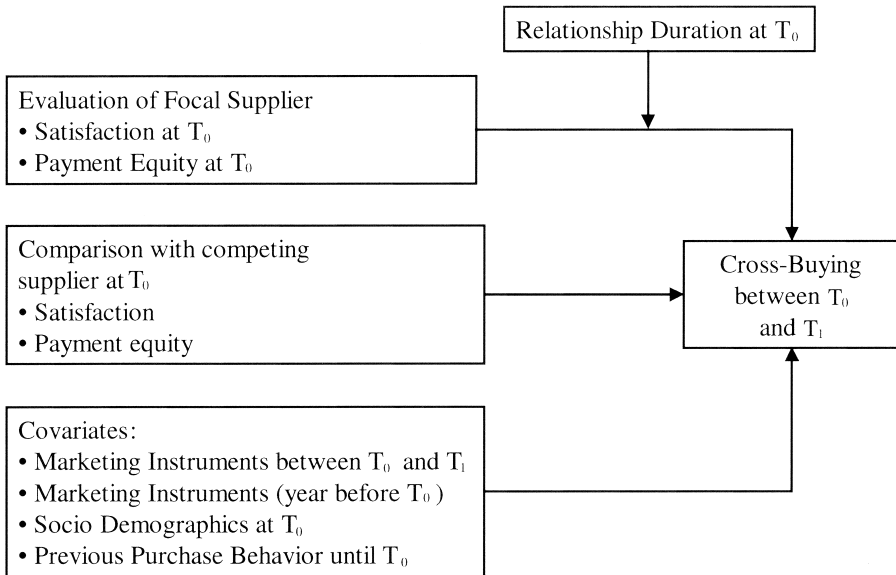


Figure 1. Dynamic Model of Cross-buying

2.2. Hypotheses

2.2.1. Satisfaction with focal supplier

The relationship between satisfaction and customer loyalty has gained much attention in the marketing literature.¹ There is now substantial evidence that higher satisfaction levels lead to higher purchase intentions (Anderson & Sullivan, 1993; Mittal, Kumar & Tsiros, 1999; Zeithaml, Berry & Parasuraman, 1996). However, the link between the respondents' stated intentions and ultimate behavior is not obvious, as individuals do not always act as they say they will (Morwitz, Steckel & Gupta, 1997). Only recently, researchers have related customer satisfaction to actual purchase behavior (Bolton, 1998; Bolton & Lemon, 1999). Both studies concern customers of continuous service providers with relatively high switching costs. Bolton (1998) finds support for a positive effect of satisfaction on relationship duration (in the telecommunications industry), while Bolton and Lemon (1999) report a positive effect of customer satisfaction on usage of a service (telecommunications and entertainment). Given this empirical evidence, we hypothesize that:

H_1 : satisfaction with the focal supplier has a positive effect on cross-buying.

2.2.2. Payment equity

The studies of Bolton and Lemon (1999) and Bolton, Kannan and Bramlett (2000) show that perceived fairness is important in determining the length and depth of a relationship. One may expect that the perceived fairness of the currently purchased services will have a positive effect on the perceived fairness of prices of additional services. Hence, payment equity should have a positive effect on cross-buying. Thus, we hypothesize that:

H_2 : perceived payment equity with the focal supplier has a positive effect on cross-buying.

2.2.3. Competing suppliers

Inman, Dyer and Jia, (1997) define regret as the difference between the performance of a foregone competing alternative and the performance of the chosen alternative and find that it has a significant impact on postchoice evaluation. Bolton, Kannan and Bramlett, (2000) extend this notion by showing that regret has a significant impact on service usage and retention. As noted above, concerns over regret may be prevalent in a cross-buying context as customers become enmeshed in a more extensive decision process compared to that of remaining a customer. This will be especially true for the insurance industry, where insurance contracts are often automatically continued and the retention decision may not be elaborate. Therefore, we expect that the difference between the evaluation of the focal supplier and the evaluation of the competing supplier has a positive effect on cross-buying and that this holds for both differences in satisfaction and payment equity. Hence, we hypothesize that:

H_3 : The difference between satisfaction with a focal supplier and satisfaction with a competing supplier has a positive effect on cross-buying.

H_4 : The difference between payment equity of the focal supplier and payment equity of a competing supplier has a positive effect on cross-buying.

2.2.4 Experience effect

In the social psychology literature, individuals in early stages of a relationship have been found to have less confidence in their evaluations of their partner than in later stages of that relationship (Swan & Gill, 1997). This greater confidence may enhance the effect of such evaluations on behavior in later stages of the relationship. Following this notion, Bolton (1998) and Rust et al. (1999) argued that this same process might also hold for customers' confidence in their satisfaction judgments. Bolton (1998) provides empirical support for the stronger effect of satisfaction in lengthy relationships. Whether this also holds for the effect of payment equity is uncertain. Prices can be viewed as relatively objective characteristics. In contrast, satisfaction judgments are based on experiences with the supplier, which take some years to be developed. However, as payment equity is a perception reflecting the evaluation of price given the perceived quality, one might argue that this experience effect would also hold for payment equity. Moreover, Reinartz and Kumar (2000, p. 21) argued that customers with lengthy relationships also become more value conscious.

To summarize, we hypothesize that:

H_5 : The positive effect of satisfaction on cross-buying will be greater for customers with lengthier relationships with the focal supplier.

H_6 : The positive effect of payment equity on cross-buying will be greater for customers with lengthier relationships with the focal supplier.

3. Research methodology

3.1. Research context

To investigate cross-buying, we study the behavior of customers of a large Dutch insurance underwriter. In this industry, companies often have sophisticated database systems and track the behavior of their customers (Fletcher, Wright & Desai, 1996). The insurance company in this study is a large direct writer selling all types of insurance policies (life, health, car, third party, furniture, etc.) and as well as some financial services (loans and saving accounts). However, in terms of percentage of services sold, their core business is insurance. The average duration of their customer relationships is approximately 10 years.

3.2. Research design

3.2.1. Database

The database covers two time periods. The first time period starts when a customer enters the relationship with the insurance company. We mark ending of this period as T_0 , the point in time when we conducted a survey of customers of the company. The length of T_0 obviously varies across customers because each started the relationship at a different point in time.

The second time period starts at T_0 and ends one year later at T_1 . We chose this time period as contractual obligations and portfolio changes by consumers are more likely to require as much as a year before they take place. During this second time period we recorded any portfolio changes that appeared in the database. Thus, the incidence of cross-buying was observed subsequent to the detailed survey.

3.2.2. Data collection and sample

The T_0 survey was administered by telephone in October 1999. Using relationship duration, number of services purchased and claiming behavior as stratification criteria, a sample of 6525 customers was selected from the company database. Potential respondents were made aware that the company sponsored the study and that the results would be used to improve the service quality of the company. They were assured that the results of the study would remain confidential.

The questionnaire resulted in a response of 2300 customers, a response rate 35%. After deleting cases with too many missing values on key variables, we obtained a sample size of 2018 customers.

3.2.3. Measurement

We first describe how we measure cross-buying. Next, we discuss the measurement of the independent variables and the included covariates. For more detail, see the Appendix.

3.2.4. Dependent variable

We measure cross-buying as the difference in the number of services purchased from the focal supplier between T_0 and T_1 as reflected by the company database. Note that the difference can also be negative. In our initial model, we jointly consider these positive and

negative scores for the following reasons. First, in line with Bolton and Lemon (1999), we assume that increasing the number of services and decreasing the number of services is the same decision process. Second, estimating two models for increasing and decreasing is rather difficult in this particular case because of few observations in the latter situation. However, we explore whether our assumptions hold in section 4.3.

Although this cross-buying measure reflects the attractiveness of the focal supplier, it is not immediately clear from this difference score whether the provider has failed to attract a customer due to the fact that the customer is not satisfied or that there is no need for any additional products. In order to control for the latter possibility, we estimate the effect of satisfaction and payment equity only for customers who need new types of insurance. Toward this end, at T_0 we asked respondents to indicate whether they intended to purchase any of 13 commonly purchased insurance services within the next twelve months. As we are only interested in consumers with a potential need for additional insurance service, this selection criterion reduced the sample size to 205 customers.

3.2.5. Independent variables

In the T_0 survey, we asked respondents to evaluate the focal insurance company. With regard to the evaluation of a competitor, we first asked respondents whether they do business with other competing insurance companies. Next, we asked them to evaluate the most important competitor (Ping, 1993), selected by the customer. Satisfaction with the insurance company and the competitor were measured with a seven-item scale adapted from Singh (1990) (see the Appendix). The coefficient alpha of this scale is 0.83 for the focal supplier and 0.89 for the competitor, respectively.

Payment equity was measured with two items adapted from Singh (1990) and Bolton and Lemon (1999). The correlations between these two items are 0.48 for the focal supplier and 0.58 for the competing supplier.² Relationship duration was measured as the number of years the customer has had a relationship with the supplier. It was calculated as the interval in years between T_0 and the date of the first transaction (see Bolton, 1998).

3.2.6. Covariates

We included the following socio-demographic indicators as covariates: age, income, family life cycle stage and the expectancy of an important event (that is, birth of a child, marriage and so on). We also included covariates for the type of insurance and the total number of insurance contracts held at T_0 . Finally, we included two marketing instruments in the model; the participation of the customer in a loyalty program and the number of direct mailings received between T_0 and T_1 and the preceding year before T_0 .³ The loyalty program is a usage reward program providing members monetary rewards based on the number of services purchased. The measurement of the covariates is described in the Appendix.

3.2.7. Statistical model

Before we describe the exact estimation procedure, we first describe the formulation of our statistical model. This model is formulated based on the hypotheses in Section 2 and the available data.

$$\begin{aligned}
y_i = & \alpha_0 + \alpha_1 Fsat_{i,0} + \alpha_2 Exp_{i,0} * Fsat_{i,0} + \alpha_3 \tau_i * (Fsat_{i,0} - Csat_{i,0}) \\
& + \alpha_4 Fpaym_{i,0} + \alpha_5 Exp_{i,0} * Fpaym_{i,0} + \alpha_6 \tau_i * (Fpaym_{i,0} - Cpaym_{i,0}) \\
& + \alpha_7 Exp_{i,0} + \alpha_8 \tau_i + \beta X_i + \gamma Z_i + \varepsilon_i
\end{aligned} \tag{1}$$

where

$$y_i = Serv_{i,1} - Serv_{i,0} \tag{2}$$

The index (i,0) indicates an observation for individual i, at T₀ and index (i,1) that for individual i at T₁. Also,

Serv = Number of services purchased

Fsat = Satisfaction with focal supplier

Exp = The natural log of relationship duration in years⁴

τ = Dummy indicating whether a customer evaluated a competing supplier (1 = yes, 0 = no). This dummy is needed as the evaluation of a competitor can only be estimated for customers who acutally provided such an estimate.

Csat = Satisfaction with competing supplier

Fpaym = Payment equity of focal supplier

Cpaym = Payment equity of competing supplier

X = Vector of marketing instruments

Z = Vector of other covariates (socio demographics and previous, purchase behavior)

ε = Error term

As hypothesized in H₃ and H₄, we include a comparison between the supplier and the most important competitor in (1). This modeling formulation is in line with Bolton, Kannan and Bramlett (2000). Since the majority of customers (90%) only did business with one or two suppliers, we did not take multiple competitors into account.

3.2.8. Estimation

For the 205 observations on y_i , it holds that in most of the cases they take a value of -1, 0 and 1, and only seldom a value of -2 or +2. Thus, it seems reasonable to resort to an ordered probit model instead of the standard linear regression model (see Long, 1997). In an ordered probit model, the observed response variable is modeled based on an underlying continuous latent variable y_i^* which depends linearly on explanatory variables denoted as x . Each response category of the observed variable Y_i corresponds to a range of values for the latent variable. This model is estimated with maximum likelihood. We have mean-centered the relationship duration variable. In order to gain greater insight into the effects of our independent variables on cross-buying, we use a hierarchical modeling approach with the following four steps: (I) we start with a model with the covariates (X and Z); (II) subsequently we add the main effects of satisfaction and payment equity (Fsat and Fpaym); (III) then we include the differences between the supplier and the competitor ((Fsat - Csat) and (Fpaym - Cpaym) and (IV) we end with including the moderating effect of relationship length ((Exp*Fsat) and (Exp*Fpaym)). To limit the number of variables in the final model, we only retain those covariates in the model that have a p-value below 0.20.

Table 1
Correlation matrix of independent variables

	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10
Fsat (X1)	1.00									
Fpaym (X2)	0.14	1.00								
Csat (X3)	0.30	0.02	1.00							
Cpaym (X4)	0.25	0.02	0.30	1.00						
Exp (X5)	0.11	-0.05	0.04	0.04	1.00					
Loyalty Program (X6)	0.22	0.13	-0.15	0.00	0.33	1.00				
Direct Mail (X7)	0.07	0.06	-0.13	-0.01	0.15	0.59	1.00			
Age (x8)	0.02	-0.06	0.02	0.01	0.49	0.14	-0.02	1.00		
Claiming (X9)	0.21	0.11	-0.11	0.18	0.22	0.49	0.46	-0.08	1.00	
Financial Products (X10)	0.03	-0.03	0.08	0.12	-0.14	0.01	-0.02	-0.07	0.04	1.00
Total No. Of Services (X11)	0.15	0.07	0.09	0.07	0.27	0.55	0.53	0.03	0.76	0.10

3.2.9. Difference scores

It is sometimes argued that the use of difference scores can cause low reliability, multicollinearity and variance restrictions (Peter, Churchill & Brown, 1993). Low reliability, however, appears more likely when there is a high correlation between the two components of the difference scores. In our case, the correlation coefficients between the evaluations are 0.10 for satisfaction and 0.09 for payment equity, respectively. The correlations between the comparison terms and the main effects are all below 0.60. We conclude that our results presented below are not vulnerable due to low reliability and multicollinearity. Finally, we use White's (1980) method to correct for potential heteroscedasticity in the errors and variables.

4. Results

4.1. Descriptive statistics

Between times T_0 and T_1 , 6.4% of the 205 customers have left the company. When we consider the difference in the number of financial services purchased between T_0 and T_1 (that is, y_i), we find the following. Some 2.4% reduced the services purchased by two or more, 10.2% by one service, and 76.6% did not change at all. At the same time, 6.8% increased the number by one service and 4% increased their portfolio with two or more.⁵ According to the management of the company, these figures are typical in this industry. However, the number of changes is enough to estimate models (Long, 1997).

Customers of the insurance company are rather satisfied with an average value of 3.8, while they have somewhat less favorable price perceptions with an average value of 3.5. A competing supplier was evaluated by 60% of the customers. For these, customers were significantly less satisfied with the competing supplier (average value of 3.7; $t = 2.28$ ($p < 0.05$)). They also perceived the prices of the competing supplier to be significantly higher (average value of 3.3; $t = 2.21$ ($p < 0.05$)).

In order to gain insight into the associations among the independent variables in the model, we calculated correlation coefficients displayed in Table 1. The majority of the

correlation coefficients are below 0.6. Only the correlation coefficient between the number of services purchased and claiming behavior lies above 0.7. This can be explained by the fact that customers with more products will have a higher probability to claim. Note that the correlation coefficients for the variables of interest in our model (that is, satisfaction, payment equity, satisfaction competitor and payment equity competitor) are rather low with coefficients below 0.3. The relatively low correlations indicate the absence of multicollinearity problems (Leeflang et al., 2000 p. 348).

4.2. Estimation results for ordered probit model

We employed an ordered probit model, as reported in Table 2, where respondent's scores were ranked in terms of the number and type changes in service levels between the survey and one year later. The variables and the accompanying parameters are displayed in the first and second column. The hypothesis is noted in the third column. In subsequent columns, the estimates for four different statistical models are displayed. We start with describing the simplest model, which only includes covariates.

4.2.1. Model I

The first model explains approximately 34% of the variance and is highly significant. As could be expected, the number of direct mailings ($p < 0.01$) and loyalty program membership ($p < 0.05$) affect cross-buying positively. The age of the customer also has a significant positive effect ($p < 0.01$). Furthermore, the estimation results reveal that a recent claim has a positive impact on cross-buying ($p < 0.01$). The same holds for the ownership of a financial product, such as a loan ($p < 0.01$). Customers purchasing rather complex financial products at this insurance provider may perceive this supplier as more reliable than those who only purchase simpler insurance services. Finally, the total number of services purchased has a negative effect on cross-buying ($p < 0.01$). We conjecture that for customers with more services at T_0 , the probability to cross-buy may decrease because their needs may already be filled. However, this also hints at the presence other constraints that may cause consumers to divide their insurance services across several suppliers.

4.2.2. Model II

In the second model, we add the main effects of satisfaction and payment equity. This model explains 34% of the variance and is still significant. According to the likelihood ratio test the inclusion of the two main effects does not improve the model fit ($p > 0.10$) (Pindyck & Rubinfeld, 1998). This is also reflected in nonsignificant positive coefficients ($p > 0.10$). Thus, it appears that neither satisfaction nor payment equity directly affects cross-buying. Hence, there is no support for H_1 and H_2 . The effects of the covariates remain the same.

4.2.3. Model III

The differences between the focal supplier and the competitor on satisfaction and payment equity measures are added in the third model. The model fit increases significantly. The R^2 is 0.40, while the likelihood has increased significantly according to the likelihood ratio test ($p < 0.01$). This is also reflected in the positive, significant coefficient for the payment equity

Table 2
Ordered probit model results parameter estimates (standard errors) (N = 205)

Variable	Parameter	Hypothesis (Expected Sign)	Model I ^{a,b}	Model II	Model III	Model IV
Marketing Instruments						
Direct Mail $T_1 - T_0$	β_1		0.34*** (0.09)	0.36*** (0.09)	0.37*** (0.09)	0.40*** (0.09)
Loyalty Program	β_3		0.61** (0.25)	0.55** (0.26)	0.46* (0.27)	0.51* (0.28)
Other Covariates						
Age	γ_1		0.03*** (0.01)	0.03*** (0.01)	0.03*** (0.01)	0.03*** (0.01)
Recently Claimed	γ_2		1.02*** (0.35)	0.97*** (0.35)	1.08*** (0.36)	1.20*** (0.37)
Financial Products	γ_4		0.49** (0.25)	0.50** (0.25)	0.64** (0.25)	0.77*** (0.27)
Total No. of Services	γ_5		-0.36*** (0.09)	-0.36*** (0.09)	-0.39*** (0.09)	-0.43*** (0.10)
Satisfaction terms						
Fsat _{i,0}	α_1	1 (+)	-	0.20 (0.18)	0.24 (0.19)	0.18 (0.21)
Fpaym _{i,0}	α_4	2 (+)	-	0.16 (0.18)	-0.09 (0.23)	-0.17 (0.22)
$\tau_c^*(Fsat_{i,0} - Csat_{i,0})$	α_3	3 (+)	-	-	0.27 (0.24)	0.16 (0.23)
$\tau_{ci}^*(Fpaym_{i,0} - Cpaym_{i,0})$	α_6	4 (+)	-	-	0.39** (0.17)	0.49*** (0.16)
Log(Exp _{i,0})*Fsat _{i,0}	α_2	5 (+)	-	-	-	0.64** (0.02)
Log(Exp _{i,0})*Fpaym _{i,0}	α_5	6 (+)	-	-	-	-0.70*** (0.23)
Log(Exp _{i,0})	α_7	N.A.	-	-	-	0.09 (1.08)
Constants						
C(1) ^c			0.06 (0.47)	1.39 (0.97)	0.73 (0.73)	0.13 (1.15)
C(2)			2.96*** (0.56)	4.32 (1.03)	3.79*** (1.08)	3.37*** (1.21)
C(3)			3.65*** (0.58)	4.99*** (1.04)	4.49*** (1.10)	4.10*** (1.21)
Likelihood Ratio (Degrees of Freedom)			51.2*** (6)	53.2*** (8)	62.1*** (10)	73.3*** (13)
Likelihood Ratio Test ^d			-	2	8.9***	11.2***
R ² (McKelvey and Zavoina, 1978)			0.34	0.34	0.40	0.46
Adjusted R ²			0.31	0.31	0.37	0.42

Notes

^a Standard errors and t-values adjusted for heteroskedasticity using the White (1980) consistent covariance matrix estimator

^b * = p-value <0.10; ** p-value <0.05; *** p-value <0.01

^c In the ordered probit model the number of constants is the number of classes minus 1. In this particular case we have four classes. Thus, three constants are estimated.

^d In this test we compare the likelihood ratio statistics of the subsequent models. It is calculated as the difference between likelihood ratio of the estimated model (i.e., II) minus the likelihood ratio of the estimated model in the previous step (i.e., I). A significant value implies that the added variables explain significantly more variance.

difference score. However, no significant effect for the satisfaction difference score is found. Thus, we find support for H_4 , while our results do not support H_3 . The coefficients of the main effects remain insignificant. The covariate coefficients remain approximately the same.

4.2.4. Model IV

In the last model, we add the main effect of experience and an interaction effect of experience with both satisfaction and payment equity. According to the likelihood ratio test, the included variables increase the model fit significantly ($p < 0.01$). The R^2 of 0.46 also reflects this improved model fit.⁶ Both interaction effects are significant. For satisfaction we find a positive coefficient ($p < 0.05$). Thus, the positive effect of satisfaction is increased by relationship length. Hence our results support H_5 . Note, however, that as we have mean-centered relationship length and find no strong positive main effect of satisfaction, this also implies that for customers with short relationships, satisfaction may have a negative effect. Our estimations reveal a negative interaction effect between payment equity and relationship length. Thus, we find no support for H_6 , which suggested that the positive effect of payment equity would be increased by relationship duration. With respect to terms previously entered, the coefficients do not change to meaningful degree. This further suggests that multicollinearity does not have a significant impact on our estimation results (Leeflang et al., 2000).

Furthermore, our results show that the largest part of the variance in the model is explained by the marketing instruments and past behavior. The hypothesis testing results are disappointing, as we only find support for only two of the six stated hypotheses. We surmise that this may be due to the nature of our dependent variable that includes both the positive and negative aspects of service change. In order to gain further insight, we continue with an additional analysis, in which we specifically distinguish between these two aspects of cross-buying.

4.3. The two aspects of cross-buying

In order to gain further insight into the two aspects of cross-buying, we estimate two additional models.⁷ In this analysis, we divided customers into two parts: those who increased the number of services (Group 1) and those who did not (Group 2). In both models the dependent variable is a binary variable. Hence, we use the probit model.

Results are displayed in Table 3. For comparison purpose, we estimated the same effects as in the ordered probit model. Both models are significant and explain approximately 30% of the variance. The estimation results reveal some rather interesting findings. Note, however, that these findings are tentative and should be considered carefully as the number of observations in the group of customers reducing the services or increasing the number of services is rather small. We find strong significant positive effects of the marketing instrument for the model explaining the purchasing of new services ($p < 0.01$; $p < 0.05$), while we find less strong effects in the model explaining a reduction in the number of services. Thus marketing instruments are suited for increasing the number of services, while they are less effective in preventing customers to decrease their number of services.

In both models there is no main effect of satisfaction ($p > 0.10$). However, although payment equity has no effect in the model explaining service reductions, it has a negative

Table 3

Probit models for decreasing and increasing number of services parameter estimates (standard errors)
(N = 205)

Variable	Decreasing Number of Services (0 = no, 1 = yes) ^{a,b}	Increasing Number of Services (0 = no, 1 = yes)
Marketing Instruments		
Direct Mail $T_1 - T_0$	-0.21* (0.13)	0.44*** (0.14)
Loyalty Program	-0.19 (0.49)	0.91** (0.39)
Other Covariates		
Age	-0.03** (0.01)	0.02 (0.02)
Recently Claimed	-0.71 (0.49)	1.671*** (0.51)
Financial Products	-0.67* (0.36)	0.701** (0.37)
Total No. of Services	0.381*** (0.11)	-0.46*** (0.15)
Satisfaction terms		
Fsat _{i,0}	-0.24 (0.28)	0.34 (0.35)
Fpaym _{i,0}	-0.05 (0.28)	-0.62* (0.36)
$\tau_c^*(Fsat_{i,0} - Csat_{i,0})$	-0.77** (0.34)	0.01 (0.37)
$\tau_{ci}^*(Fpaym_{i,0} - Cpaym_{i,0})$	-0.38* (0.22)	0.451* (0.24)
Log(Exp _{i,0})*Fsat _i	-1.05** (0.00)	-0.03 (0.95)
Log(Exp _{i,0})*Fpaym _{i,0}	0.38 (0.27)	-1.38*** (0.40)
Log(Exp _{i,0})	2.34* (1.24)	4.67** (1.73)
Constant	0.92 (1.38)	-2.43 (1.76)
Likelihood Ratio (Degrees of Freedom)	46.19*** (13)	48.78*** (13)
McFadden R ²	0.30	0.35
Adjusted R ²	0.25	0.31

Notes

^a As in this probit model a 1 means decreasing the products, a negative sign of the coefficients implies that the variable negatively affects decreasing the number of products purchased.

^b * = p-value < 0.10; ** p-value < 0.05; *** p-value < 0.01

effect on service additions ($p < 0.10$). The difference becomes more striking if we consider the effect of the difference in satisfaction scores. We find a significant negative effect of this difference on reductions ($p < 0.05$), while we find no effect in the model explaining the addition of services ($p > 0.10$). The same holds for the interaction term between experience and satisfaction. Thus, satisfaction explains reductions, while it does not explain service additions. With respect to the interaction term between payment equity and experience, we find the opposite results. Here, we find no effect in the reduction model, while we find a negative interaction effect in the model explaining service increases. Finally, we find a positive effect of relationship length in both models.

5. Conclusions and management implications

5.1. Discussion

From this research we have presented the results of a dynamic model in the insurance industry in which we relate cross-buying to satisfaction and payment equity as well as to the

Table 4
Summary of results

Hypothesis	Formulation	Result	Note
1	Satisfaction with the focal supplier has a positive effect on cross-buying.	Not Supported	–
2	Perceived payment equity with the focal supplier has a positive effect on cross-buying.	Not Supported	–
3	The difference between satisfaction with a focal supplier and satisfaction with a competing supplier has a positive effect on cross-buying.	Not Supported	Supported for reduction in services
4	The difference between payment equity of the focal supplier and payment equity of a competing supplier has a positive effect on cross-buying.	Supported	–
5	The positive effect of satisfaction will be larger for customers with lengthy relationships than for customers with short relationships.	Supported	Only holds for reduction of services
6	The positive effect of payment equity will be larger for customers with lengthy relationships than for customers with short relationships.	Not Supported	

comparison with a competitor on these two evaluations. In Table 4 we summarize our results and the hypothesis tests. These show that only two of the stated hypotheses are supported from our primary analysis. However, if we separate increases from reductions in services, the findings are enriched. Consequently, despite some unexpected results, they provide new and potentially useful insights that we explore below.

5.1.1. The effect of satisfaction

Our initial results show no main effect of satisfaction on cross-buying. Similarly, the difference in satisfaction levels between the focal supplier and the competitor had no significant effect on cross-buying. This is in contrast to earlier findings by Bolton (1998), Bolton and Lemon (1999) and Mittal and Kamakura (2001). However, these results are in line with experiences in practice that suggest it is hard to find a link between satisfaction and actual behavior (Jones & Sasser, 1995).

More likely, however, the difference with prior results is due to the difference in our dependent variable, cross-buying. Previous studies linked behavioral outcomes on retention or usage of a service to continued purchasing. Our data indicate that this association may not be true for cross-buying.

The analysis of the two-sided nature of cross-buying provides support for this conclusion. When we evaluated the data for increases in number of services, there was no effect as before. However, when we examined reductions in service, the significant link to satisfaction appeared. In other words, satisfaction with existing services does not lead to the purchase of new services. However, lower satisfaction may result in the abandonment of services already purchased. This last result is parallel to that of previous research.

Our further finding of no effect from differences in satisfaction between supplier and its competitor may be caused by the absence of consumer knowledge of important and differ-

entiating attributes (Meyers & Alpert, 1968). In our data, there were relatively small differences in satisfaction levels across the two firms. We suspect that customers encounter difficulties when evaluating satisfaction for a competitor about which they have limited experience. Thus, the role of differential satisfaction may be limited for products not extensively shopped and play a limited role in cross-buying of these.

However, the effect of satisfaction is more complicated. Although we find no main effect of satisfaction, our results show that as relationship length increases the effect of satisfaction grows on cross-buying. This finding is again in line with the studies of Bolton (1998) and Rust et al. (1999). As has been suggested, this result may be due to a lesser confidence held by short relationship customers about their satisfaction opinion.

Note, however, that the absence of a main effect of satisfaction, and the mean centering of relationship age, implies that satisfaction might have a negative effect on cross-buying for customers with short relationships. Stated differently, high satisfaction scores in the beginning of the relationship might have a negative effect on cross-buying. Boulding et al. (1993) argue that past performance influences expectations. Thus, customers with higher satisfaction scores may well have higher expectations, expectations that might be difficult to meet. As a result, the occurrence probability of negative disconfirmation in the subsequent time period could be large. Both Boulding et al. (1993) and Bolton (1998) suggest that preferences of customers with less experience are more vulnerable to this negative disconfirmation. Thus, high satisfaction scores in the early phases of the relationship could have negative consequences for relationship development.

5.1.2. The effect of payment equity

As with our results on satisfaction, we do not find a main effect for payment equity. This again is contrary to what we had expected from our generalization of Bolton and Lemon's (1999) findings. The same argument on the difference between cross-buying and usage decisions, given above for the effect for satisfaction, may also explain this result.

Our results do, however, show that a better performance on payment equity, as compared to a competitor, has a positive effect on cross-buying. This provides parallel empirical results to those of Bolton, Kannan and Bramlett (2000). Nevertheless, we caution that this effect may be a consequence of the inability of some respondents to report payment equity for a competing supplier. The evaluation of those who did respond may be the consequence of some other dissatisfaction, price sensitivity, or other predictor of switching.

In addition to the positive effect of the payment equity differential, we also find a counter intuitive, negative interaction effect of payment equity on cross-buying. Our separate analyses for respondents, who added services and those who decreased, show that this anomaly holds only for the former. In this run, a negative main effect of payment equity approached significance.

We explain these results as follows. Bolton and Lemon (1999, p. 182) suggest that customers seek to maintain payment equity in a service relationship. Customers with high payment equity might find the currently owned services fairly priced. In fact, they might have drawn to these services because of the attractive prices. Given this, they are unwilling to increase their service portfolio with less attractively priced goods, as this would damage their payment equity. The negative interaction effect with relationship duration may be the

consequence of customers with lengthy relationships becoming more price conscious (Reinartz & Kumar, 2000). Hence, customers with lengthy relationships are increasingly sensitive to the retention of payment equity.

5.1.3. *Cross-buying*

Overall, there are two important consequences to be derived from this research. The first is that attitudes toward past purchases may not be a good indicator of household potential for cross-buying. This unexpected result may reflect the consumer's perception that the qualities evidenced by a supplier for one product are not germane to the decision for another product, even though the latter may come from the same general category.

Secondly, we find that the dropping of an existing service is not the mirror image of adding a new service. This is reflected in the different effects of the antecedents on these two types of behavior. We note that this not only concerns the already discussed effect of satisfaction and payment equity, but also the effect of the marketing instruments. For example, the loyalty program has a larger effect on adding a new policy than on dropping an existing policy. The larger effect of marketing instruments on the addition of new services is not totally unexpected, as instruments usually focus on cross-selling new services. In future research, these differences in behavior should be taken into account.

5.2. *Management implications*

Our results have the following implications for customer management in multiservice industries.

First, given the interaction effect of relationship duration and satisfaction, managers should focus on providing short relationship customers with more confidence in their supplier evaluations. This contradicts traditional logic in the business literature that managers should focus on its most loyal customer. We propose that managers show that they can be trusted in early stages of the customer relationship. For example, as early as the acquisition phase, companies could focus on fulfilling promises. Companies may move beyond this by using a more proactive approach to create more positive experiences in the early period of a relationship.

Second, our results show that low prices of currently held service products, which provide high payment equity to customers, do not automatically lead to higher cross-buying probabilities. Instead, given that the customers seek to manage this equity, managers will find it hard to cross-sell (higher) priced services to make these customers more profitable.

The positive effect of the difference in payment equity between the focal and competing supplier further suggests that competitive prices may be needed to avoid losing opportunities. This may not require major price advantage, only that the price for additional services not be too high.

More generally, these results show that managers should be careful in attracting customers primarily with low prices. If economic benefits are the primary benefit offered to attract new customers to the firm, this may lead to perceptions of high payment equity and resistance to the purchase of additional products and enhanced profitability to the firm. Thus, we see a

trade-off between capturing additional customers with low prices and the future profitability of accounts won in this manner.

Lastly, our results show that strategies to prevent the dropping of services may not affect the adoption of new services. In particular, for the addition of new services, a more proactive approach, using marketing instruments, is needed. To prevent dropping of services, managers should focus the quality and price of the current purchased services.

5.3. Limitations, future research and a caution

In the insurance industry we studied, the degree of consistency among the offered services may be relatively high, but for firms in other industries this consistency may be low (consider, for example, airlines that also offer hotel accommodations). In the latter case, one might expect even lower spillover effects of satisfaction from an initially purchased service to others. We speculate that in such contexts, corporate or brand image may be a more important factor (Aaker & Keller, 1991). Future research could take both satisfaction and corporate or brand image into account when studying the antecedents of cross-buying within companies offering less consistent services.

Second, although we corrected for customer needs in the measurement of cross-buying, our measures still do not fully capture the demand potential for additional services. In future research, researchers will need longitudinal data on purchases of customers at competing suppliers. The relatively small number of changes in cross-buying in our study further suggests that longer time periods may be required to reflect the patterns of changing consumer service portfolios.

Third, in this study we considered customers of only a single company. This could have affected evaluations of the competitor. More neutral customers might provide better data on competitors if they were more actively evaluating them. Future research might consider samples including these customers whose inclusion may lead to models with higher explanatory power for satisfaction and payment equity.

Given these limitations, the highly unexpected empirical results in this article should be labeled tentative. Thus, we should be cautious with the conclusions we have drawn about the antecedents to cross-buying. As noted, further study the role of relationship length, the two-sided nature of cross-buying, and the possibility for delay in the onset of the effect of satisfaction ought to be examined. Conceivably, for example, satisfaction delay may be found in more expensive, tangible products where consumers have had an opportunity to test product quality. We note that purchasers of life insurance policies on their own life are unlikely to know how well their underwriter performs in the delivery of this product. The use of models that allow for customer heterogeneity may shed further light here as well.

Lastly, future research could study the long-term effect of satisfaction and payment equity on purchase behavior, thereby applying longitudinal measures of satisfaction, payment equity and purchase behavior. Current research indicates that the effect of satisfaction at T_0 on purchase intentions at T_1 should be mediated by satisfaction at T_1 (Mittal, Kumar & Tsiros, 1999). As new evaluations are continually updated with new experiences, we may find our expected effects when actual purchase behavior is studied. Given these concerns, effects different from those in our research may appear. Nevertheless, for the time being

theorists and marketers alike should take great care in extrapolating the effects of satisfaction for the consumption of one product to the purchase of related goods, even in the same family.

Notes

1. We consider overall satisfaction, which is defined as an overall evaluation based on the total purchase and consumption experience over time (Anderson, Fornell & Lehmann, 1994, p. 54).
2. We have also applied Confirmatory Factor Analysis, which revealed satisfactory fit-indices (Focal Supplier: $\chi^2=123.11$ (df.=26), GFI=0.99; CFI=0.98; Competing Supplier: $\chi^2=96.12$ (df.=26); GFI=0.98, CFI=0.99). We have also checked the discriminant validity of these scales by using the well-known procedure as described by Anderson and Gerbing (1988). The analysis reveals strong evidence for discriminant validity.
3. Within the studied year the company increased the prices for two types of insurances. We control for these price increases with the incorporation of the dummies indicating whether a customer owned these insurances at T_0 .
4. As it is assumed that the effect of relationship duration is not linear (that is duration has diminishing effects at higher levels), we include the logarithm of relationship duration (Weiss & Kurland, 1997).
5. In the Netherlands the car insurance premium is the only premium that depends on claiming behavior. However, as customers report their claim history to their (new) provider, switching will only lead to a marginal decrease in the premium paid.
6. We estimated the same model for all 2018 customers. The R^2 of this model is 0.10. Thus our procedure selecting only these customers planning to purchase new services improves the measurement of cross-buying.
7. The editor, L. P. Bucklin, suggested this analysis.

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Appendix: Measures for Satisfaction, Payment Equity and Covariates

Satisfaction	Source
How satisfied are you about (1 = very dissatisfied, 5 = very satisfied)	
... the personal attention of XYZ*	Singh (1990)
... the willingness of XYZ to explain procedures	Singh (1990)
... the service quality of XYZ	Singh (1990)
... the response to claims	New
... the expertise of the employees of XYZ	New
... your relationship with XYZ	New
... the alertness of XYZ	New
Payment Equity	Source
How satisfied are you about the insurance premium of XYZ? (1 = very dissatisfied, 5 = very satisfied)	Singh (1990), Bolton and Lemon (1999)
Do you think the insurance premium of your insurance at XYZ is —Too high, High, Normal, Low, Too low?	Bolton and Lemon (1999)
Covariates	Database or Survey
<i>Loyalty program membership</i>	
Customer member of loyalty program at T ₀	Database
<i>Direct mailings</i>	
Number of direct mailings sent during time period	Database
<i>Total number of Services</i>	
Summation of services purchased	Database
<i>Claiming behavior</i>	
Customer recently claimed (1 = yes, 0 = no)	Database
<i>Type of product</i>	
Dummy indicating if type of product (e.g. car insurance) is purchased (1 = yes, 0 = no)	Database
<i>Age</i>	
What is your age?	Survey

Note:

* XYZ denotes the focal supplier for evaluation of the focal supplier and it denotes the competing supplier for evaluation of the competing supplier