WHAT KEEPS THE E-BANKING CUSTOMER LOYAL? A MULTIGROUP ANALYSIS OF THE MODERATING ROLE OF CONSUMER CHARACTERISTICS ON E-LOYALTY IN THE FINANCIAL SERVICE INDUSTRY

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ABSTRACT

At first sight the Internet is the ideal medium for carrying out banking activities due to its cost savings potential and speed of information transmission. From a technological and cost-driven standpoint it may seem quite logical for banks to shift as many banking activities online as possible. At the same time, the question of how to foster customer loyalty arises when the relationship between the bank and the user becomes a virtual one.

This paper investigates the importance of antecedents of online loyalty such as trust, quality of the Web site, quality of the service and overall satisfaction. Rather than investigating which factors drive customers to use online banking instead of offline banking, this paper addresses the problem of how to keep customers online and loyal to a specific supplier.

A survey among more than 2,000 customers of an Austrian online bank was conducted and a structural equation modeling approach was used to gain important insights into how customer retention in the online banking business can be ensured. Satisfaction and trust were identified as important antecedents of loyalty. Additionally, the moderating role of consumer characteristics (gender, age, involvement, perceived risk and technophobia) was supported by the data.

Keywords: Loyalty, E-Banking, Structural Equation Modeling, Multigroup Analysis

1. Introduction

In order to reap the benefits of having loyal customers and gaining a competitive advantage online, companies need to develop a thorough understanding of the antecedents of loyalty on the World Wide Web (e-loyalty), such as business factors [Bhattacherjee 2001] or personal characteristics [Mägi 2003]. In order to investigate the importance of e-loyalty, the identification of variables influencing repeat purchasing behavior and word-of-mouth recommendation is a crucial area of research [Srinivasan *et al.* 2002]. This holds especially true for those industries which already depend heavily on their reputations and long-lasting relationships in the offline world, as is the case with the financial sector. The widespread adoption of online banking services calls for research investigating those factors which are responsible for keeping customers loyal.

A model explaining the antecedents of loyalty in the online banking industry has to incorporate factors which take into account the characteristics of the industry as well as those of the medium. Therefore, we consider antecedents such as trust (being important online and offline) and the perceived quality of the Web site (being important only online). Besides being topics of scholarly research in the information systems domain, these issues have been long discussed in marketing. More than two decades have passed since the concept of relationship marketing was first mentioned in the marketing literature [Berry 1983]. Drivers such as intense competition, demanding customers and enablers such as the Internet are the reason why relationship marketing has increasingly attracted the attention of researchers and practitioners alike [Sheth and Parvatiyar 2002]. In relationship marketing research the concept of customer loyalty plays a central role [Christopher *et al*. 2004]. The preeminent importance of retaining customers is supported by several studies [Chen *et al*. 2002], confirming the relevance of customers' loyalty to a firm's profitability.

New forms of online communication offer a host of new and promising opportunities for customer retention on the World Wide Web, while at the same time intensifying competition [Vatanasombut *et al.* 2004]. In particular, this applies to company-controlled communication, giving companies the ability to customize information with regard to the individual needs of a particular customer and to optimize the customer's feedback opportunities [Kierzkowski *et al.* 1996]. At the same time, companies also face completely new challenges arising from customer-controlled

Internet communication, such as the growing importance of brand strength, economies of scale and size [Gallaugher 1999].

In view of these changed circumstances in the buyer-seller interaction, researchers and practitioners have to rethink previous concepts of loyalty [Luo and Seyedian 2003/04]. Empirical studies comparing customer satisfaction and loyalty in online and offline environments show substantial differences in terms of customer attitudes and behavior [Shankar *et al.* 2003]. At the same time, the integration of Internet technology into the customer loyalty concept is rarely discussed in the relationship marketing literature [Wirtz and Lihotzky 2003].

In the following section we take a look at scholarly literature pertaining to e-banking. In particular, we concentrate on those papers which have already developed models explaining user behavior in the e-banking context. Next, we develop a model investigating the antecedents of e-loyalty, including cognitive and affective constructs (trust, satisfaction) and quality aspects (Web site quality, service quality). Additional variables, such as gender or involvement, are hypothesized to have a moderating influence on e-loyalty [Seethamraju 2004].

2. Conceptual Framework and Hypotheses

While there is a rich body of literature on online financial services and their adoption, little is known about how to keep customers loyal to an online bank. This section provides an overview of previous e-banking research and introduces the concept of loyalty. A framework relating loyalty to important antecedents and a number of moderating variables is introduced.

2.1 The E-Banking Sector

Online banking, which can be defined as the provision of information or services by a bank to its customers over the Internet [Daniel 1999], has been one of the major developments in the financial service sector in recent years. According to a survey conducted by Pew Internet and America Life, online banking has been the fastest growing Internet activity in the U.S. over the last five years. As of November 2004, a total of 53 million Americans (44% of all U.S. Internet users) use some form of online banking service [McGann 2005]. In Germany the number of online accounts has increased almost tenfold between 1999 and 2004, with 40% of all accounts now being online [Association of German Banks 2004].

A short review of the literature on electronic banking briefly illustrates the major issues that researchers and practitioners have dealt with in recent years. Security turned out to be a major obstacle for many customers who were otherwise willing to switch to the online world [Martin 1998]. Besides assuring customers that their privacy is protected, Hamlet [2000] suggests that banks should not over-animate or clutter their Web sites with too much advertising. In addition, care should be taken not to over-personalize the online-experience in order to avoid the impression that personal financial information is freely available. Bhattacherjee [2001] uses online banking customers to test his expectation-confirmation model of IS continuance. His results suggest that users' continuance intention is determined by their satisfaction and perceived usefulness of the application. Table 1 shows a number of research papers that empirically validate models in the context of e-banking. Tan and Teo [2000] found that attitudinal factors such as Internet experience, the relative advantage of online banking and perceived risk, and perceived behavioral control factors predict the intention to adopt Internet banking services. The survey by Karjaluoto *et al.* [2002] showed that prior experience with computers and technology as well as people’s attitudes toward computers influences both their attitude toward online banking and their actual behavior. Mukherjee and Nath [2003] found that communication had a moderate influence on trust, while opportunistic behavior had a significant negative effect and trust in general led to a higher level of commitment in online banking. Information sharing and distrust in the Internet were identified as the two major drawbacks for Thai Internet banking adoption by Rotchanakitumnuai and Speece [2004]. Based on a survey amongst Finnish banking customers, Pikkarainen *et al.* [2004] found perceived usefulness and information on online banking on the Web site to be the main drivers for the acceptance of online banking. A recent study by Lassar *et al.* [2005] showed that Internet related innovativeness is positively related to the adoption of online banking.

With the number of online banking consumers steadily increasing, the focus of attention shifts from enticing customers to the online world to retaining them. While the focus of the aforementioned papers lies on offline versus online, this paper deals with the problem of how to keep a customer online and loyal to a specific supplier. Therefore, we analyze which antecedents might induce customers to stay with a particular online bank instead of switching suppliers. We will start discussing our model by referring to the concept of loyalty, which has been investigated extensively in the offline world.

2.2 Loyalty

The concept of loyalty is defined from three different angles. Besides discussing previous research to conceptualize the construct, we present a structural definition of loyalty and introduce our framework for measuring important antecedents of loyalty in an online context.

2.2.1 Behavioral and Attributional Definitions

The modeling of loyalty has a long tradition in academic literature research [Jacoby and Knyer 1973]. The majority of early studies define loyalty as the repeat purchasing of a particular service or product [Homburg and Giering 2001]. This approach has been long criticized by numerous scholars for the missing differentiation between true and spurious loyalty: "The key point is that these spurious loyalty buyers lack any attachment to brand attributes, and they can be immediately captured by another brand that offers a better deal…" [Day 1969]. In order to avoid the pitfall of equating repeat purchasing with loyalty, the combination of attitudinal and behavioral attributes is recommended [Grisaffe 2001]. This paper therefore applies a two-dimensional conceptualization of loyalty consisting of both attitudinal and behavioral elements, with recommendation and repeat purchasing acting as sub-dimensions of the construct.

Table 1: Models in E-Banking Literature

Author	*Endogenous Variables*	*Exogenous Variables*
Tan and Teo [2000]	Intention to Use Internet Banking Service	Attitudes Subjective Norms Perceived Behavioral Control
Karjaluoto *et al.* [2002]	Attitude Toward Internet Banking Internet Banking Usage	Prior Computer Experience Prior Technological Experience Personal Banking Experience Reference Group Influence
Mukherjee and Nath [2003]	Commitment Trust	Shared Value Communication Opportunistic Behavior
Rotchanakitumnuai and Speece [2004]	Internet Banking Adoption	Web Benefits (Information Quality, Information Accessibility, Information Sharing, Transaction Benefit) Web Barriers (Organization Barrier, Trust, Legal Support)
Pikkarainen *et al.* [2004]	Online Banking Use	Perceived Usefulness Perceived Ease of Use Perceived Enjoyment Information on Online Banking Security and Privacy Quality of Internet Connection
Lassar *et al.* [2005]	Online Banking Adoption	Consumer Innovativeness Personal Characteristics

2.2.2 Dispositional Definition

The positive outcomes of loyalty have been the subject of several theoretical articles and empirical studies. Reichheld and Sasser [1990] found that reducing defections by 5% yields improvements in profitability of 20% to 85%. When Reichheld and Schefter [2000] analyzed customer life-cycle economics in several e-commerce sectors (e.g. online selling of books, groceries and consumer electronics) they found that on the Internet the same rules apply as in the offline world. Early losses, which are caused by expenses for acquiring new customers, are followed by rising profits, caused by a higher willingness to pay and more tolerance on the part of the customer if problems occur [Zeithaml *et al.* 1996]. In fact, the success of several online companies is attributed to their high ratio of repeat sales [Gefen 2002]. Amazon.com, for example, generated 66% of its sales from purchases made by returning customers a couple of years ago already [The Economist 2000]. Loyal customers are also more inclined to recommend an online service provider to other customers [Heskett *et al.* 1994]. Referrals increase the customer base by lowering the costs of attracting new ones [Reichheld 1996].

2.2.3 Structural Definition

The structural definition of a construct describes the way in which it is linked to other variables [Bagozzi 1984]. Our model, which describes loyalty as the endogenous variable, includes one exogenous (Web site quality), three mediating (service quality, overall satisfaction, trust) and five moderating variables (gender, age, involvement, variety seeking behavior, technophobia) and can be seen in Figure 1. Taking into consideration psychological attributes of customers such as involvement or technophobia is crucial when measuring loyalty [Mägi 2003]. In the following sections all influencing variables will be described briefly.

Satisfaction can be defined as a post-choice evaluative judgment concerning a specific purpose decision [Oliver 1979] and is mostly used as part of the confirmation/disconfirmation paradigm [Oliver and Svan 1989]. Although in previous models customer satisfaction is solely seen as the result of cognitive processes, recent studies and conceptualizations suggest that affections contribute to the explanation and prediction of customer satisfaction [Fornell and Wernerfelt 1987, Homburg and Giering 2001]. Furthermore, several authors have argued that satisfaction is based on the customer's cumulative experience rather than being a transaction-specific phenomenon [Anderson *et al.* 1994, Bayus 1992]. Especially in the context of the relationship between loyalty and satisfaction, conceptualizing satisfaction with a single transaction is too restrictive [Homburg and Giering 2001]. Dissatisfaction with a single transaction does not lead to customer switching, neither does one satisfying transaction result in long-term loyalty. For measuring satisfaction we therefore used a single item and asked the respondents to state their overall level of satisfaction [Kettinger and Lee 1994].

With an increasing number of customers being online, the importance of Web sites for influencing purchasing decisions is rising steadily. Measuring the quality of Web sites from a user's perspective enables companies to take corrective actions, develop an appropriate e-business strategy, and improve their operations [Ganapathy *et al.* 2004, Seethamraju 2004]. Service quality and Web site quality are incorporated into our structural model to account for the above-mentioned distinction between cumulative and transaction-specific experiences. Whereas service quality and Web site quality are supposed to measure the perceived transaction quality on a cognitive basis, overall satisfaction refers to the cumulative experience based on an affective component. It is important to mention that service quality and overall satisfaction implicitly include issues such as price perception, which is usually only felt rather than objectively measurable. This can be argued by the complex and constantly changing pricing system in the banking industry, which makes it hard for the average customer to determine the overall costs of the banking product. We therefore hypothesize that service quality and Web site quality positively influence perceived overall satisfaction (H1, H2). Additionally, we assume a positive effect of perceived Web site quality and service quality on trust (H3, H4). Finally, Web site quality can be seen as an antecedent of service quality (H5). As the services marketing literature suggests, customers who are not satisfied with the basic services of the organization are likely to seek to satisfy their needs elsewhere [Gruen 1995]. Consistent with Bitner [1990] and Rust *et al.* [1995] we hypothesize a positive impact of customer satisfaction on customer loyalty (H6).

Trust can be defined as the willingness to rely on an exchange partner in whom one has confidence [Moormann *et al.* 1992]. It is an important antecedent in most models dealing with relationships that include loyalty or satisfaction as dependent variables [Schaupp and Bélanger 2005]. Bryant *et al.* [2002] state that "trust is an important consideration in the development and fostering of e-Commerce relationships in the context of the knowledge-based economy". Lowering perceived risks associated with online transactions as well as maintaining transaction trust are vital keys to attracting and retaining customers [Verhagen and Tan 2004]. Following Morgan and Hunt [1994], we hypothesize a positive effect of trust on loyalty (H7).

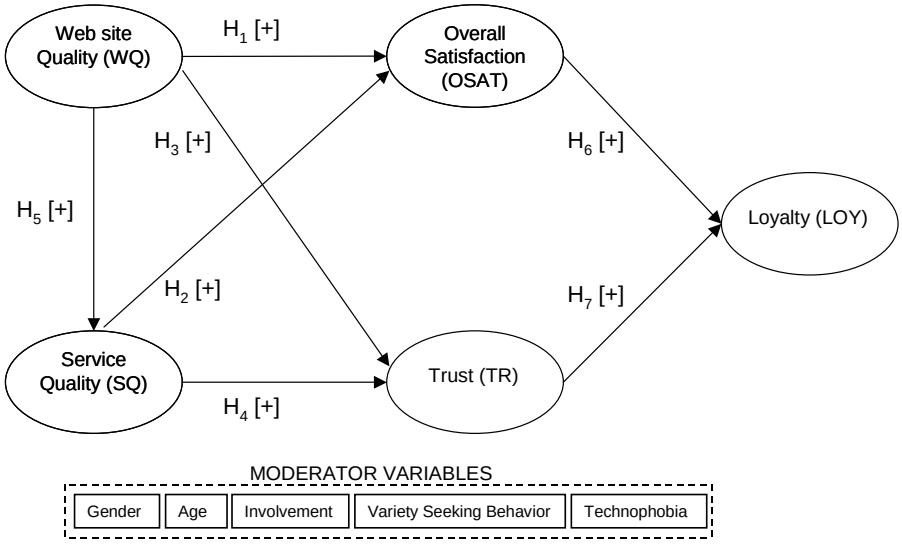

Figure 1: Antecedents of Loyalty

Based on previous research we included gender, age, involvement, variety seeking behavior, and technophobia as moderators in our model. The impact of gender on buying behavior in an offline environment has been the focus of attention in numerous scholarly papers [Jasper and Lan 1992, Slama and Tashlian 1985, Zeithaml 1985]. Slama and Tashlian [1985] found that women are more involved in purchasing activities and more heavily influenced by personal interactions than men. Although similar gender studies in an online environment are difficult to find, we hypothesize that gender plays a moderating role on the Internet, too. Age is another popular demographic characteristic in previous consumer studies. Most of the studies focus on the differences in people's information-processing abilities [Gilly and Zeithaml 1985, Roedder and Cole 1986]. Gilly and Zeithaml [1985] found that our capability to process information declines with age. Similar to Homburg and Giering [2001], we suggest a negative moderating role of age on Web site quality, service quality and satisfaction.

Involvement can be defined as the degree of personal relevance of an object, product or service to a customer and affects customer behavior in a number of ways [Beatty *et al.* 1988, Zaichkovsky 1985, Barki and Hartwick 1989]. Bloemer *et al.* [1996] state that the level of customer involvement with the product must be considered when measuring customer retention. We therefore perceive involvement as an important moderating variable in both the offline and the online world.

McAllister and Pessemier [1982] provided an interdisciplinary review of variety seeking behavior. They divided the explanations into two groups, namely (a) derived motivation, in which varied behavior is the result of some other motivation such as multiple uses, and (b) direct motivation, in which varied behavior is the result of a desire for change per se due to interpersonal or intrapersonal motives. In line with Homburg and Giering [2001], who found that variety seeking behavior moderates “offline” customer retention, we take into account the importance of variety seeking in the online world.

Following Dekimpe et al. [2000], technological risk has to be added to the list of variables negatively influencing the perception of risk. Many users are overwhelmed by the technological complexity of computers leading to a low level of self-efficacy [Thatcher and Perrewe 2002]. This renders consumers less open to innovative technology-related products and may lead to an aversion to sophisticated products or technologies. This behavior can be described as technophobia [Mitchell 1994], which we hypothesize to have a negative moderating effect on loyalty in the electronic banking sector.

3. Research Methodology and Data

According to Kierzkowski et al. [1996], the online banking and finance industry has a high potential for building individual relationships on the World Wide Web. We therefore selected the customers of a pure DotCom bank as our universe. The following sections discuss in detail the methodology of the survey and the development of the measurement instrument.

3.1 Sample and Data Collection

The survey was conducted in cooperation with the largest Austrian online bank, which mailed a questionnaire to 7,500 randomly selected customers. The scope of the study was explained in a cover letter and an enclosed return envelope guaranteed the anonymity of the results. After three weeks a total of 2,253 respondents (30.04 %) had replied, of which 178 questionnaires had more than 10% missing values and were excluded from further analyses. Missing EM-Algorithm was used for data imputation for the remaining 2,075 data records, leading to a final response rate of 27.67%. Demographic characteristics of the respondents are listed in the appendix. We compared the characteristics of our sample to those of the universe of Austrian Internet users published by the Austrian Internet Monitor [2005] and found no statistically significant differences. Furthermore, T-tests showed no significant difference between early and late respondents, which otherwise could be seen as an indicator for a non-response bias in quantitative surveys [Armstrong and Overton 1977]. As non-normality of data occurred in the data file, we used bootstrapping for testing the effects of non-normal distributed variables on our structural equation model [Efron and Tibishiran, 1993]. The analyses produced no significant changes in parameter estimation. Finally, the data were split randomly into two sub-samples (n1 = 1,015, n2 = 1,060). Sample 1 serves as the calibration sample on which the initially hypothesized model is tested and on which the post-hoc analysis was conducted. Afterwards, the validity of the structure of the final model was tested based on sample 2.

3.2 Measures

Empirically validated scales were adapted to the context of the study and used to measure the respective constructs. All items are listed in Appendix B. Additionally, a confirmatory factor analysis was used to assess construct measurement. Four items were removed after the analysis based on inadequate factor loadings and theoretical arguments. A 6-point Likert scale was used to measure all items. In the case of Web site quality, item parceling was used to reduce the total of 15 items to three subscales (design, structure and content).

A comprehensive pretest, including qualitative interviews and focus groups with customers, was carried out to ensure the understandability of the items. In total, 18 persons of different gender, age and educational backgrounds were asked to fill out the questionnaire and, at the same time, to comment on the questions. Their comments were written down and led to a complete revision of the questionnaire in order to increase its understandability.

4. Results

In the following sections we report the results of our survey. First, the measurement model is evaluated and local fit indices are discussed. Second, the standard regression weights and global fit indices for both samples are given. Finally, we present the multigroup analyses based on the respective indicator variables and the latent mean structures.

4.1 Measurement Assessment

Prior to assessing the fit of the global model, it is necessary to check the quality of the construct measurement. This was done by following the standard procedures for scale development and assessment postulated by Anderson and Gerbing [1988].

Positive factor loadings are a necessary condition for adequate construct measurement. As can be seen in Table 2, the indicator reliability of all items exceeds .4 [Bagozzi and Baumgartner 1994], and the factor reliability is higher than .6 [Bagozzi and Yi 1988].

Table 2: Local Fit Indices

Latent Variable	*Item Name*	*Indicator Reliability*	*T-Values*	*Factor Reliability*	*AVE*	*FLR*
Web Site Quality (WQ)	x_1	0.708	---	0.93	0.74	0.52
	x_2	0.590	20.102			
	x_3	0.451	20.872			
Service Quality (SQ)	y_1	0.636	30.856	0.87	0.69	0.52
	y_2	0.679	32.465			
	y_3	0.816	37.955			
	y_4	0.767	35.953			
	y_5	0.776	---			
Trust (TR)	y_7	0.798	25.551	0.80	0.58	0.57
	y_8	0.849	26.008			
	y_9	0.470	---			
Loyalty (LOY)	y_{10}	0.520	---	0.70	0.55	0.56
	y_{11}	0.821	27.963			

Alternative measures of how well a construct is measured by its indicators are the average variance extracted [Anderson and Gerbing 1988] and the Fornell-Larcker Ratio [Fornell and Larcker 1981]. Values greater than 0.5 for the average variance extracted and lower than 1 for the Fornell-Larcker Ratio are recommended [Bagozzi and Yi 1988]. In this study, all of the mentioned fit indices meet the recommended levels. Further analyses can be conducted as values suggest strong construct and discriminant validity.

4.2 Model Testing

Structural Equation Modeling (SEM) appears to be the best available statistical technique for testing the hypotheses since it includes the indirect effects of one latent variable on another [Nidumolou 1989]. In Figure 2 an overview of the hypothesized effects is given and all parameters are labeled. As was discussed in previous sections, we hypothesize that loyalty (LOY) is positively influenced by overall satisfaction (OSAT) (H6) and trust (H7), which are in turn affected by Web site quality (WQ) and service quality (SQ) (H1 – H4). Additionally, the quality of a Web site affects the perception of service quality (H5).

AMOS 5.0 was used to estimate the main effects. Table 3 shows the standardized regression weights with their relevant t-values for both samples, all of which are significant ($p<.01$), supporting all hypotheses. Loyalty is therefore significantly affected by satisfaction and trust. Additionally, effects of Web site quality on service quality, satisfaction and trust were observed, as was a significant effect of service quality on overall satisfaction.

The overall fit measures indicate that the hypothesized model is a good representation of the structures underlying the observed data.

The goodness-of-fit index and the adjusted goodness-of-fit index, two descriptive overall measures, both meet the recommended value of .9 [Bagozzi and Yi 1988]. The RMSEA, a measure that is based on the concept of noncentrality for both samples is .059, which is slightly below the recommended upper limit of .6 [Hu and Bentler 1999]. In both cases the $\chi 2/df$ ratio is higher than 2.5, which can be attributed to the comparatively large sample

sizes. However, both incremental fit measures meet the recommended levels, which are .95 for the NFI [Hu *et al.* 1999] and .9 for the TLI.

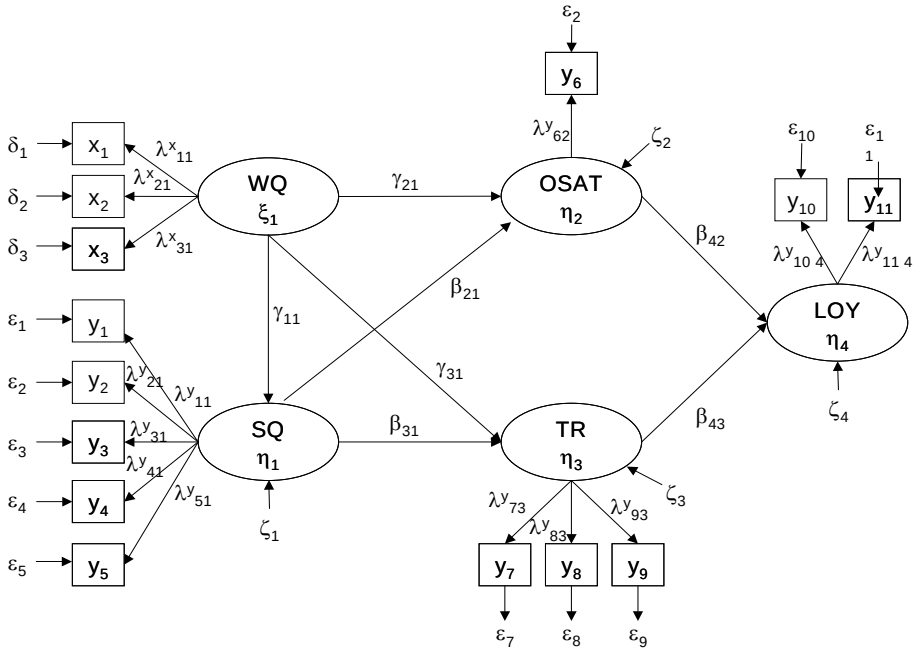

Figure 2: Structural Equation Model Measuring the Antecedents of Loyalty

Table 3: Standard Regression Weights and T-values

Sample 1			*Sample2*		
Parameter	*Parameter Value (standardized)*	*t-value*	*Parameter*	*Parameter Value (standardized)*	*t-value*
γ_{11}	0.472	13.328	γ_{11}	0.402	11.183
γ_{21}	0.425	10.617	γ_{21}	0.457	11.460
γ_{31}	0.431	10.902	γ_{31}	0.365	9.312
β_{21}	0.548	14.204	β_{21}	0.525	14.095
β_{31}	0.290	8.318	β_{31}	0.287	8.159
β_{42}	0.690	13.890	β_{42}	0.600	11.817
β_{43}	0.250	6.599	β_{43}	0.270	6.698

Table 4: Global Fit Indices

Goodness-of-Fit Measure	*Sample 1*	*Sample 2*
Stand Alone Fit Measures		
χ^2 (d.f.)	315.363 (70)	349.342 (70)
AGFI	0.936	0.934
GFI	0.957	0.956
RMR	0.038	0.038
RMSEA	0.059	0.059
Incremental Fit Measures		
NFI	0.966	0.960
TLI	0.965	0.958

Thus, although the $\chi 2$ statistic is significant for both samples ($p < .01$) we conclude that the model has been validated successfully and can be seen as appropriate for the explanation and prediction of loyalty in the context of online banking.

4.3 Multigroup and Latent Mean Analysis

Once support for the main effects had been found, the next step was to include the suggested moderator variables into the model in order to gain further insights. Median splits were conducted in this study based upon the values of the moderator variables. Furthermore, multiple group analyses were calculated in a hierarchical approach comparing two sub-samples which were selected according to gender or based on a median split of the respective moderating variable.

In a first step, an overall Chi-square difference was calculated for each of the moderator variables. Technically, a model with equality constraints is compared to a model that allows the parameters to vary. This test imposes the null hypothesis that the moderator variables do not have any effect on the seven parameters. As can be seen from Table 5, these hypotheses were rejected for each of the moderator variables ($\Delta\chi 2 \geq 14.07$, $\Delta DF = 7$). Afterwards, constraints were imposed to test the invariance of the model across various subgroups. According to Steenkamp and Baumgartner [1998], who propose a hierarchical procedure in multigroup analysis, the equivalence of measurement weights was analyzed in a second step [Steenkamp and Baumgartner 1998]. Because these models are nested with the general model having one degree of freedom less than the restricted model, the $\chi 2$-value will always be lower for the general model [Homburg and Giering 2001]. Significant differences (CR = 3.84 at the 5% level) indicate that the hypotheses of the moderator effect are supported.

In a last step, the invariance of the means of the latent variables was tested. The purpose of testing latent mean structures is to test the equivalence of means related to each underlying factor. Because these factors cannot be observed directly, latent means can be calculated for one group only. The results of the multigroup analyses are shown in Table 5 and Table 6.

Table 5: Results of Multigroup Analyses

Gender		*Chi-Square Difference*
Male	*Female*	*(ΔDF =1)*
γ_{11} = 0.592 (14.962)	γ_{11} = 0.455 (7.752)	$\Delta\chi^2$ = 4.402*
γ_{21} = 0.384 (12.254)	γ_{21} = 0.372 (8.367)	$\Delta\chi^2$ = 0.063
γ_{31} = 0.458 (11.388)	γ_{31} = 0.526 (8.296)	$\Delta\chi^2$ = 0.011
β_{21} = 0.414 (19.915)	β_{21} = 0.311 (9.507)	$\Delta\chi^2$ = 7.760*
β_{31} = 0.261 (9.447)	β_{31} = 0.317 (7.124)	$\Delta\chi^2$ = 0.220
β_{42} = 0.801 (16.030)	β_{42} = 0.843 (8.514)	$\Delta\chi^2$ = 0.936
β_{43} = 0.252 (7.819)	β_{43} = 0.231 (5.525)	$\Delta\chi^2$ = 0.093
$\Delta\chi^2$ = for all gammas set equal across subgroups (DF = 7): 15,161*		

Age		*Chi-Square Difference*
Low	*High*	*(ΔDF =1)*
γ_{11} = 0.514 (12.273)	γ_{11} = 0.602 (12.446)	$\Delta\chi^2$ = 1.971
γ_{21} = 0.299 (8.425)	γ_{21} = 0.468 (13.584)	$\Delta\chi^2$ = 11.645*
γ_{31} = 0.438 (9.664)	γ_{31} = 0.517 (10.388)	$\Delta\chi^2$ = 1.303
β_{21} = 0.464 (15.170)	β_{21} = 0.315 (13.511)	$\Delta\chi^2$ = 16.503*
β_{31} = 0.344 (9.699)	β_{31} = 0.226 (6.982)	$\Delta\chi^2$ = 7.284*
β_{42} = 0.834 (12.681)	β_{42} = 0.828 (13.918)	$\Delta\chi^2$ = 0.079
β_{43} = 0.182 (5.080)	β_{43} = 0.294 (8.153)	$\Delta\chi^2$ = 5.085*
$\Delta\chi^2$ = for all gammas set equal across subgroups (DF = 7): 35,727*		

Involvement		*Chi-Square Difference*
Low	*High*	*(ΔDF =1)*
γ_{11} = 0.586 (13.563)	γ_{11} = 0.475 (10.258)	$\Delta\chi^2$ = 4.223*
γ_{21} = 0.387 (11.341)	γ_{21} = 0.390 (10.288)	$\Delta\chi^2$ = 0.045
γ_{31} = 0.470 (10.477)	γ_{31} = 0.494 (9.659)	$\Delta\chi^2$ = 0.008
β_{21} = 0.367 (14.345)	β_{21} = 0.416 (14.128)	$\Delta\chi^2$ = 1.396
β_{31} = 0.265 (8.449)	β_{31} = 0.309 (8.281)	$\Delta\chi^2$ = 0.753
β_{42} = 0.835 (13.510)	β_{42} = 0.724 (11.768)	$\Delta\chi^2$ = 1.641
β_{43} = 0.276 (7.793)	β_{43} = 0.203 (5.715)	$\Delta\chi^2$ = 2.063
$\Delta\chi^2$ = for all gammas set equal across subgroups (DF = 7): 14,317*		

Variety Seeking Behavior		*Chi-Square Difference*
Low	*High*	*(ΔDF =1)*
γ_{11} = 0.586 (13.563)	γ_{11} = 0.475 (10.258)	$\Delta\chi^2$ = 17.577*
γ_{21} = 0.387 (11.341)	γ_{21} = 0.390 (10.288)	$\Delta\chi^2$ = 0.289
γ_{31} = 0.470 (10.477)	γ_{31} = 0.494 (9.659)	$\Delta\chi^2$ = 2.025
β_{21} = 0.367 (14.345)	β_{21} = 0.416 (14.128)	$\Delta\chi^2$ = 58.690*
β_{31} = 0.265 (8.449)	β_{31} = 0.309 (8.281)	$\Delta\chi^2$ = 15.078*
β_{42} = 0.835 (13.510)	β_{42} = 0.724 (11.768)	$\Delta\chi^2$ = 0.307
β_{43} = 0.276 (7.793)	β_{43} = 0.203 (5.715)	$\Delta\chi^2$ = 0.361
$\Delta\chi^2$ = for all gammas set equal across subgroups (DF = 7): 121,778*		

Technophobia		*Chi-Square Difference*
Low	*High*	*(ΔDF =1)*
γ_{11} = 0.524 (11.232)	γ_{11} = 0.569 (13.241)	$\Delta\chi^2$ = 0.351
γ_{21} = 0.378 (9.249)	γ_{21} = 0.388 (12.239)	$\Delta\chi^2$ = 0.192
γ_{31} = 0.513 (9.305)	γ_{31} = 0.449 (10.717)	$\Delta\chi^2$ = 0.838
β_{21} = 0.447 (13.304)	β_{21} = 0.345 (15.156)	$\Delta\chi^2$ = 4.013*
β_{31} = 0.309 (7.446)	β_{31} = 0.268 (9.315)	$\Delta\chi^2$ = 0.496
β_{42} = 0.721 (11.985)	β_{42} = 0.866 (13.592)	$\Delta\chi^2$ = 1.520
β_{43} = 0.232 (6.829)	β_{43} = 0.265 (7.054)	$\Delta\chi^2$ = 0.283
$\Delta\chi^2$ = for all gammas set equal across subgroups (DF = 7): 9,013*		

**Chi-square difference is significant at the 5% level.*

Table 5 shows a moderating effect of gender for two parameters (γ11 and β21). These results suggest that the influence of Web site quality on service quality and service quality on overall satisfaction is significantly higher for men than for women. In other words, service quality for men is more important in explaining satisfaction. This result is supported by a significantly lower Web site quality estimate for men.

Age is our next moderator variable. The analysis shows a positive moderator effect on the relationship between Web site quality – satisfaction, service quality – satisfaction, service quality – trust and trust – loyalty. Additionally, elderly people rate the importance of Web site quality and service quality significantly lower than younger respondents. These results are similar to the findings of the study of Homburg and Giering [2001], who found that service quality has a stronger impact on satisfaction for younger people than for the elderly.

Table 6: Latent Mean Structures; standardized estimates (t-values)

Moderator Variable	*Group*	*Web Site Quality*	*Service Quality*	*Overall Satisfaction*	*Trust*	*Loyalty*
Gender	Male+	0	0	0	0	0
	Female	-0.267 (-8.639)*	0.002 (0.058)	0.009 (0.266)	0.028 (0.0753)	0.025 (0.530)
Age	Low+	0	0	0	0	0
	High	0.068 (2.381)*	-0.119 (-3.442)*	-0.019 (-0.655)	0.017 (0.505)	0.013 (0.299)
Involvement	Low+	0	0	0	0	0
	High	0.109 (3.767)*	0.171 (4.928)*	-0.022 (-0.736)	-0.018 (-0.549)	0.169 (3.962)*
Variety Seeking Behavior	Low+	0	0	0	0	0
	High	-0.241 (-8.372)*	-0.174 (-4.720)*	-0.077 (-2.531)*	-0.062 (-1.768)	0.008 (0.186)
Technophobia	Low+	0	0	0	0	0
	High	-0.017 (-0.585)	-0.109 (-3.151)*	-0.009 (-0.312)	0.042 (1.251)	-0.112 (-2.539)*

+ *Reference Group*

* *Chi-square difference is significant at the 5% level.*

The multigroup analysis for involvement shows only one moderating effect. The effect of Web site quality on service quality is lower for low-involvement people. Otherwise, comparisons of the latent mean structure between low-involvement and high-involvement people indicate a significant difference for the latter. The moderating role of involvement leads to a higher perception of the two quality aspects. Furthermore, highly involved people stay more loyal to an online bank than people with low involvement in banking and finance.

Variety seekers are people who tend to switch between several suppliers regardless of their perceived satisfaction with previous companies or service clients. The current findings are partially inconsistent with the current interpretation of variety seeking. While analyses show significant differences in latent mean structures of service and Web site quality, no difference was found between the two groups of low/high variety seekers in terms of loyalty. These surprising results may be explained by a very low total mean of the variable (mean = 2.66; 1 = totally agree, 6 = totally disagree).

As the last moderating variable, technophobia has a negative moderator effect on the relationship between service quality and satisfaction. In other words, service quality is more important for people with low technophobia. The latent mean structure analyses confirm these findings. The mean estimate of service quality is significantly lower for this group. Additionally, people who have less anxiety in using the Internet are more loyal toward an online service provider.

5. Conclusions and Outlook

Our results confirm that loyalty of e-banking customers is directly affected by satisfaction and trust in an online bank, which in turn are determined by Web site quality and service quality. Moderating variables such as gender, age, involvement, variety seeking behavior and technophobia exert a significant influence on some of the proposed relationships. These results have several implications for those banks which want to increase loyalty on the World Wide Web.

First, the quality of Web sites has a direct and an indirect impact on both satisfaction and trust. Companies have to redesign their Web sites with a view to enhancing usability and usefulness. Amongst the many factors which account for the perceived quality of a Web site, the avoidance of downtimes seems to be extremely important to online banks. Furthermore, based on related literature, we recommend making the sites easy to navigate and giving them an uncluttered look. Sufficient information should be given on how to conduct transactions and, most importantly, on how to get help should unforeseen events happen. Similarly to the quality of the site, the perceived quality of the service exerts a significant influence on overall satisfaction and trust.

Second, trust and overall satisfaction can be seen as major antecedents of e-loyalty. We would therefore recommend that trust-building actions are paid more attention in scholarly literature, focusing for example on pay-back guarantees or quality certificates, which are seen as helpful steps in increasing electronic customer retention. There is a plethora of literature on trust and some exemplary papers have been cited in previous sections. It seems obvious that the results of many surveys suggest incorporating trust-building measures into online customer relationships. As far as our research is concerned, the preeminent importance of trust can be explained by both the core products of the financial industry, which can be seen as the transmission and processing of highly confidential information, and trust in the medium as such, which again stands for the bank's capability to securely transfer and store confidential personal information. Unless customers establish personal contacts a in a bank branch, users of Internet banking in many cases do not have well-known contact persons and must rely completely upon the capability and trustworthiness of the bank. Therefore, the bank must build a strong brand in order to signal competence to its customers. As mentioned above, we used a pure DotCom bank as our focus of research in order to avoid interchannel conflicts. Nonetheless, it must be mentioned that this bank is the subsidiary of a well-established Austrian bank, which is clearly displayed on the homepage. The trusted brand of the parent company is thus used to create trust on the part of the consumers.

Third, and somehow a by-product of this research, our empirical findings demonstrate that surveys might be an adequate instrument for online banks to learn about their customers' attitudes. The comparatively high response rate for an online survey can be taken as an indicator that customers of DotComs are actually willing to give feedback and get in touch with their supplier.

Further research should be performed in this area to validate the model across other industries in order to assess its general stability. While we used a cross-validation approach by taking the same sample population for model calibration and validation, the use of different populations will extend its general validity. Furthermore, it might be interesting to see how the parameters change in countries with different legal regulations and varying Internet user behavior. A possible sample bias limits the the generalizability of results. Additionally, we recommend replication studies which focus exclusively on the influence of the moderating variables and might include other influencing variables such as the price of the product. By understanding how different customer segments can be differentiated,

companies may be able to better target their customers' needs, which may give them a competitive edge in a service-oriented business environment.

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APPENDIX A - Characteristics of the respondents (n = 2,075)

Gender		***Education***	
Male	70%	Secondary school	20.3%
Female	30%	High school grad.	38.0%
		University Degree	40.3%
		Other	1.4%
Age		***Internet Experience***	
– 29 years	25.1%	Casual user	1.4%
30 – 39 years	47.2%	Good skills	18.0%
40 – 49 years	25.6%	Experienced user	55.5%
50+ years	2.1%	Expert	25.0%

APPENDIX B - Survey Instrument

Code	***Item***	***Source***
	Web Site Quality	
x_1	Design (Item parceling; dimension design consists of five different items)	[Shchiglik and Barnes 2004]
x_2	Structure (Item parceling; dimension structure consists of five different items)	
x_2	Content (Item parceling; dimension content consists of five different items)	
	Service Quality	
y_1	Electronic banking at Easybank has really pleased me.	[Oliver and Svan 1989]
y_2	I am very taken with Easybank.	
y_3	I am very satisfied with Easybank.	
y_4	Easybank has done a good job for me so far.	
y_5	It was a wise decision to carry out electronic banking at Easybank.	
	Overall Satisfaction	
y_6	Please rate your overall satisfaction on a scale from 1 to 6, with "1" indicating "not satisfied" and "6" indicating "highly satisfied".	[Kettinger and Lee 1994]
	Trust	
y_7	Easybank is interested in my satisfaction.	[Delgado-Ballester and Munuera-Alemán 2001]
y_8	Easybank holds me in high regard as a customer of its product.	
y_9	Easybank offers me recommendations and advice in using the product in the best possible way.	
	Loyalty	
y_{10}	In the future I will continue to carry out electronic banking at Easybank.	[Homburg and Giering 2001]
y_{11}	In the future I will continue to recommend Easybank to my friends and acquaintances.	
	Involvement	
	Please indicate how much you:	[Zinkhan and Locander 1988]
z_1	1. use electronic banking.	
z_2	2. are involved with electronic banking.	
z_3	3. are a electronic banking expert.	
z_4	4. are interested in electronic banking, relative to other people.	
	Variety Seeking Behavior	
z_5	I often try new brands before my friends and neighbors do.	[Homburg and Giering 2001]
z_6	I like to try new and different things.	
z_7	When I see a new brand on the shelf I often buy it just to see what it's like.	
	Technophobia	
z_8	I worry about making mistakes when using electronic banking.	[Sinkovics *et al.* 2002]
z_9	It takes me a long time to complete bank transactions when using electronic banking.	
z_{10}	I feel frustrated when I use electronic banking.	