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A partial least squares path model of repurchase intention of supermarket customers

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Abstract

The objective of this paper is to model which aims to describe the extent to which customer intention to repurchase a service is influenced by customer perceptions of service quality, customer perceptions of product quality, comparative price perceptions, discount perceptions, trust, value, and customer satisfaction were considered as the major factors in the marketing literature. Partial Least Squares (PLS) Path Model approach was used to build a repurchase intention model in Turkish retailing sector with the theoretically hypothesized relationships among these major factors collecting the data from 1530 supermarket customers purchasing 102 different supermarkets.

Keywords: Customer repurchase intention, satisfaction, partial least squares path model

1. Introduction

Repurchase intention is the individual's judgment about buying again in designated service from the service from the same company, taking into account his or her current situation and likely circumstances. Customer repurchase intention is the one of the most important factors leading firms to profitability. Dramatic increase in the number of supermarkets in Turkey created an important competitive environment in terms of price advantage, product and service quality. In order to attract customers to their own supermarkets, managers conduct intensive marketing campaigns and expect that these campaigns really help in attracting consumers to their own supermarkets.

Recently, various countries have conducted customer satisfaction studies from the Partial Least Squares Path Modeling (PLS-PM) perspective at the industrial or national level. In Turkish retail sector, there are just a few study investigating the customer repurchase intention from the Structural Equation Modeling (SEM) perspective (e.g., Duman and Yağcı, 2006; Noyan and Şimşek, 2011). In this study, a model of customer repurchase intention was proposed and was tested using PLS-PM approach.

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2. Methods

PLS-PM is the component-based approach to SEM. A PLS–PM path model is described by two models: (1) the "measurement" or "outer" model relating the MVs to their own LV and (2) the "structural" or "inner" model relating some endogenous LVs to other LVs. Within the framework of this study, we will focus on the "reflective measurement model and path scheme" parameterization of PLS-PM which is commonly used in marketing modeling such as customer satisfaction studies.

2.1. Data and Sample

Data for the study were collected using hierarchical sampling as part of a larger study through face-to-face interview with the customers purchasing from the stores belonging to four different supermarket chains in the all of the districts of Istanbul, Turkey. Total of 1530 customers participated in the study. The mean age of respondents was 36.8 years, 64.1% of the respondents were male and were 34.8% of the respondents were single. The sample is also representative with regard to socio-economic status (SES) in the population.

2.2. Proposed Model and Measurements

Our proposed model with inner model specifications is depicted in Figure 1, in which straight arrows indicate causal relationships in the same direction. The proposed model is built based on two well-established theories – quality, satisfaction and performance (QSP) theory and Hirschman's (1970) exit-voice theory. Our Repurchase intention model "specialized to retailing sector" contains the cause-and-effect relationship running from the antecedents of Customer satisfaction (SAT) (i.e. Discount Perceptions (DISP), Comparative Price Perceptions (CPP), two-type of perceived quality (Service Quality Perceptions (SERQ) and Product Quality Perceptions (PQP)), Value Perceptions (VALUE), and TRUST) to one of the its consequences indicating performance (Repurchase Intention (REPIN)). In our model, in addition to the indirect paths through mediating variables, direct paths to SAT and REPIN from the drivers such as DISP, CPP, SERQ and PQP were investigated.

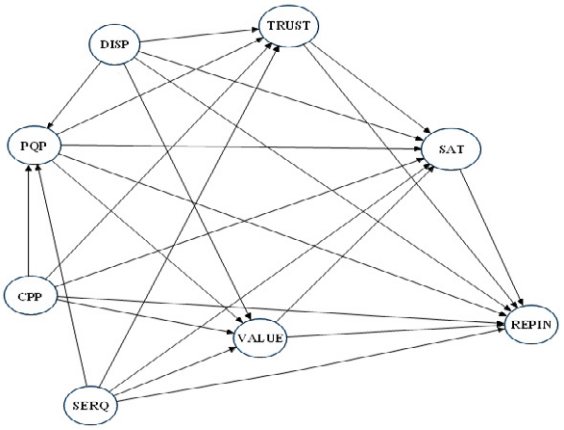

Figure 1. Proposed model of repurchase intention

Table 1. Manifest variables(MVs) and latent variables(LVs)

Service Quality Perceptions (Cronin et al., 2000)	Mean	Std.	Skewness	Kurtosis	Com.
Staff have clean and smooth appearance.	7.89	1.779	-1.006	.997	.729
Staff are concerned with customers.	7.84	1.837	-1.012	.996	.772
Staff have knowledge about products and campaigns.	7.78	1.849	-1.015	.915	.745
Staff have enough experience to help customers.	7.77	1.833	-.952	.782	.787
Staff are affable.	7.80	1.831	-.991	.932	.791

Staff are polite and respectful.	7.81	1.813	-.946	.770	.776
Staff are easy to reach.	7.82	1.748	-.920	.761	.787
Easy to communicate with staff.	7.75	1.805	-1.001	1.058	.783
Staff give understandable responses to questions.	7.75	1.842	-.934	.738	.812
Staff are reliable.	7.79	1.759	-.887	.697	.758
There is a sales person who is ready to help at any moment.	7.50	1.994	-1.010	.904	.652
Staff strive to understand my needs.	7.65	1.831	-.887	.718	.709
Staff service friendly and sincerely.	7.66	1.837	-.867	.546	.739
Cashiers are careful.	7.76	1.829	-.997	1.063	.669
Operations at payment points are reliable.	7.84	1.774	-1.049	1.447	.597
Discount Perceptions (Grewal et al., 1998)					
Some products are cheaper through market special card.	5.21	2.873	-.212	-1.210	.877
Gifts are given for purchases over a certain amount.	4.64	2.828	-.009	-1.350	.832
Gift points are given for purchases over a certain amount.	4.83	2.856	-.087	-1.308	.859
Comparative Price Perceptions(Sirohi et al., 1998;Chang and Wildt, 1994)					
When I compare with the alternative supermarkets, the product prices of this supermarket are more appropriate in general.	6.37	2.368	-.489	-.463	.874
When I compare with the alternative supermarkets, the product prices of this supermarket are cheaper than the other supermarkets.	6.38	2.314	-.577	-.284	.910
When I compare with the alternative supermarkets, I can buy the same products at a low price in this supermarket.	6.33	2.259	-.499	-.357	.874
When I compare to the other supermarkets, I save more money.	6.36	2.254	-.536	-.300	.885
Product Quality Perceptions (Sirohi et al., 1998)					
The products of vegetable-fruit department are very high in quality.	7.43	1.959	-.934	.754	.688
The products of meat-fish department are very high in quality.	7.46	1.855	-.837	.612	.734
Hot/frozen ready-made foods are very high in quality.	7.50	1.782	-.739	.385	.780
The products of bakery department are very high in quality.	7.48	1.851	-.743	.269	.779
Packaged-frozen products are very high in quality.	7.51	1.785	-.703	.307	.788
Not packaged dried foods (dried beans, pasta, grain,…) are very high in quality.	7.60	1.808	-.899	.842	.707
Milky products are very high in quality.	7.62	1.766	-.727	.244	.724
I can find the products with the brand name which I look for.	7.30	1.905	-.763	.507	.570
There are no out-of-date products on shelves.	7.85	1.784	-.950	.776	.599
In general, products of this supermarket are very high in quality.	7.58	1.752	-.772	.618	.745
Value Perceptions (Balton and Drew, 1991; Grewal et al., 1998)					
I get from this supermarket in return for money, time and effort.	7.15	1.679	-.418	-.158	.876
In general, I shop well in this supermarket.	7.16	1.715	-.418	-.193	.865
Spent money and time to shop this supermarket gives me what I wish.	7.11	1.744	-.404	-.175	.880
Trust (Anderson and Narus, 1990)					
I feel relieved about this supermarket.	7.17	1.850	-.410	-.343	.717
I believe that I can trust this supermarket will not try to cheat me.	7.51	1.841	-.659	.107	.829
I believe that this supermarket is truthful.	7.49	1.845	-.657	-.067	.856
This supermarket wants to win trust from customers.	7.48	1.799	-.595	-.018	.832
This supermarket provided me steady trust.	7.39	1.865	-.608	-.079	.826
I trust this supermarket.	7.45	1.821	-.615	-.023	.820
Customer Satisfaction (Brumley, 2002)					
I think, shopping with this supermarket is a good decision.	7.16	1.766	-.391	-.176	.804
This supermarket takes customer satisfaction as a goal.	7.20	1.716	-.414	-.180	.789
I am satisfied with preferring this supermarket.	7.20	1.753	-.401	-.324	.825
I am satisfied with shopping this supermarket.	7.28	1.748	-.406	-.333	.835
In general, I am satisfied with this supermarket.	7.23	1.757	-.444	-.163	.794
I am satisfied with pricing to product quality by this supermarket.	7.13	1.856	-.477	-.105	.763
I am really satisfied with this supermarket.	7.22	1.820	-.501	-.002	.804
Customer Repurchase Intention (Hellier et al., 2003)					
I plan to do the big part of my future shopping from this supermarket.	6.72	2.071	-.365	-.322	.826
If I go shopping today, I will go this supermarket again.	6.86	1.944	-.473	.138	.769
I purchase the big part of my shopping from this supermarket	6.59	2.203	-.412	-.334	.858
When I go shopping, I firstly consider this supermarket	6.60	2.281	-.465	-.392	.860
When I go shopping, this supermarket is my first choice.	6.59	2.269	-.474	-.317	.856

2.3. Results

A PLS-PM analysis on the whole sample has been performed in an iterative exploratory mode by first testing the model against a priori criteria; removing paths or variables; and then testing the revised model (Chin, 1998). The final model provided estimates of the strength and statistical significance of the relationships between the LVs.

PLS-PM estimation was performed using R (version 2.14.1). As the MVs scales are comparable, a standardization of the data is not necessary, so that model estimation was performed using the original data (Chatelin et al., 2002). To test whether path coefficients differ significantly from zero, confidence intervals were calculated using bootstrapping procedure (Chatelin et al., 2002). We calculated with 1530 cases and with different samples (100, 400 and 1000) to investigate stability of the results. Each bootstrap sample should have the same number of cases as the original sample (Henseler, Ringle, Sinkovics, 2009), because the standard error estimates are dependent upon the number of observations in each replication.

Since the MVs in a block are assumed to measure the same unique underlying concept, all the blocks in the model are supposed to be reflective, then they should be homogeneous and unidimensional. Hence, first of all we have to check for block homogeneity and unidimensionality. Table 2 shows values of the tools for checking the block homogeneity and unidimensionality. All the blocks are considered homogenous, i.e. the Dillon-Goldstein's rho (ρ) and Cronbach's alpha (α) are larger than 0.7 (Chin, 1998; Lee et al., 2011). Moreover, the eight blocks are unidimensional as only the first eigenvalues for each block are greater than one. For the assessment of validity, two validity subtypes are usually examined: the convergent validity and the discriminant validity. Convergent validity signifies that a set of indicators represents one and the same underlying construct, which can be demonstrated through their unidimensionality. Fornell and Larcker (1981) suggest using the average variance extracted (AVE) as a criterion of convergent validity. An AVE value of at least 0.5 indicates sufficient convergent validity, meaning that a latent variable is able to explain more than half of the variance of its indicators on average (e.g., Götz et. al, 2010). Discriminant validity is a rather complementary concept: Two conceptually different concepts should exhibit sufficient difference (i.e. the joint set of indicators is expected not to be unidimensional). In PLS path modeling, two measures of discriminant validity have been put forward: The Fornell–Larcker criterion and the cross- loadings. The Fornell–Larcker criterion (Fornell & Larcker, 1981) postulates that a latent variable shares more variance with its assigned indicators than with any other latent variable. In statistical terms, the AVE of each latent variable should be greater than the latent variable's highest squared correlation with any other latent variable. The second criterion of discriminant validity is usually a bit more liberal: The loading of each indicator was greater than all of its cross-loadings (Chin, 1998; Götz et al., 2010) with examination of the correlations between MVs and corresponding LVs. Although the Fornell–Larcker criterion assesses discriminant validity on the construct level, the cross-loadings allow this kind of evaluation on the indicator level. Furthermore, communality values given in the last column in Table 1 measure how much of a given indicator's variance is reproducible from its latent variable. In other words, communality is the part of the variance between a latent variable and its indicators that is common to both. The idea is that one expects to have more shared variance between an LV and its indicators than noise. Usually, "good" communality values are greater than 0.5. Therefore, as seen from the first three tables, the reflective model is appropriate.

Table 2. Check for block unidimensionality and homogeneity

Block	Cronbach's α	Dillon-Goldstein's ρ	First eigenvalue	Second eigenvalue	AVE
SERQ	.975	.977	11.11	.617	.740
DISP	.919	.949	2.58	.266	.856
CPP	.957	.969	3.54	.184	.886
PQP	.955	.961	7.12	.593	.711
VALUE	.928	.954	2.62	.205	.873
TRUST	.954	.963	4.88	.346	.813
SAT	.959	.966	5.61	.307	.802
REPIN	.950	.962	4.17	.347	.834

Table 3. Correlations between LVs

	SERQ	DISP	CPP	PQP	VALUE	TRUST	SAT	REPIN
SERQ	1							
DISP	.0503	1						
CPP	.2222	-.0514	1					
PQP	.6056	.1163	.1440	1				
VALUE	.5116	.0982	.4023	.612	1			
TRUST	.6338	.0914	.3181	.654	.6756	1		
SAT	.5618	.0959	.4190	.599	.8409	.7233	1	
REPIN	.4384	.1300	.4332	.429	.6880	.6119	.7683	1

Following the iterative PLS-PM procedure six paths were removed, leaving a smaller model than that originally proposed in Figure 1. Bootstrapping was used to examine the significance of path estimates. Reliable and valid outer model estimations permit an evaluation of the inner path model estimates. There is no overall fit index in PLS Path Modeling. Nevertheless, a global criterion of goodness of fit has been proposed by Tenenhaus et al. (2005): the GoF index. Such an index has been developed in order to take into account the model performance in both the measurement and the structural model and thus provide a single measure for the overall prediction performance of the model. This index is bounded between 0 and 1. Both the GoF and the relative GoF are descriptive indexes, i.e. there is no inference-based threshold to judge the statistical significance of their values. As a rule of thumb, a value of the relative GoF equal to or higher than 0.90 clearly speaks in favour of the model. In our final model, relative Gof index, outer model Gof index and inner model Gof index were 0.9767, 0.9996, and 0.9771 respectively, indicating adequacy of the model.

Table 4 provides an overview of the relationships in the final inner model. The essential criterion for assessment of the inner model is the coefficient of determination (R2) of the endogenous latent variables. Chin (1998) describes R2 values of 67%, 33%, and 19% in PLS path models as substantial, moderate, and weak, respectively. Hence, while the R2 values for PQP(37.4%), VALUE (49.4%), TRUST(55%) and REPIN (61.6%) are moderate, SAT has substantial R2 value of 76.1%. In Table 4, the direct effects correspond to the path coefficients. The indirect effects correspond to the indirect paths between latent variables. The total effects are the sum of the direct and the indirect effects.

Table 4. The relationships in the final model

Endogenous LVs	Relationships	Path Coefficients (Direct Effects)	R^2	Indirect Effects	Total Effects
PQP	SERQ->PQP	.6012	.374	–	.6012
	DISP->PQP	.0861		–	.0861
VALUE	SERQ->VALUE	.1597	.494	.2800	.4398
	DISP->VALUE	.0515		.0401	.0916
	CPP->VALUE	.3024		–	.3024
	PQP->VALUE	.4658		–	.4658
TRUST	SERQ->TRUST	.3372	.550	.2519	.5892
	DISP->TRUST	.0352		.0361	.0712
	CPP->TRUST	.1846		–	.1846
	PQP->TRUST	.4190		–	.4190
SAT	SERQ->SAT	.0854	.761	.4042	.4897
	DISP->SAT	–		.0722	.0722
	CPP->SAT	.0817		.2266	.3082
	PQP->SAT	–		.3803	.3803
	VALUE->SAT	.6068		–	.6068
	TRUST->SAT	.2331		–	.2331
REPIN	SERQ->REPIN	–	.616	.3701	.3701
	DISP->REPIN	.0674		.0529	.1202
	CPP->REPIN	.1405		.2125	.3529
	PQP->REPIN	–		.2832	.2832
	VALUE->REPIN	–		.3782	.3782
	TRUST->REPIN	.1103		.1453	.2556
	SAT->REPIN	.6232		–	.6232

3. Discussion and Conclusion

This study has explored a model of customer repurchase intention using PLS-PM approach to utilize the advantages of soft modeling with the large sample, the non-normality of the variables, the large number of MVs, and the complex nature of the proposed model. SAT was the most important influence on repurchase intention, and it was followed by almost equal effects of VALUE, the indirect effect of SQP, and CPP. VALUE was the strongest effect on SAT, and the others in order were indirect effect of SQP, PQP and CPP, while DISP had significant but relatively little influence on value. Major antecedents of TRUST were SQP and PQP, while DISP and CPP have relatively minor. The significant but the smallest contribution to VALUE was made by DISP while the effects of PQP, SQP, and CPP were nearly same and stronger. In sum, SQP was the major and DISP was the relatively minor effect on the endogenous constructs in the model.

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References

Anderson, J. C. & Narus, J. A. (1990). A model of distributor firm and manufacturer firm working partnerships. *Journal of Marketing*, 54, 42-58.

Balton R. N., Drew J. H. (1991). A multistage model of customers' assessments of service quality and value. *Journal of Consumer Research*, 17, 375-84.

Brumley, C.M. (2002). *Creating loyalty in relationship marketing: A descriptive study of supermarket loyalty programs*. Unpublished Thesis, The Perley Isaac Reed School of Journalism, West Virginia University.

Chang, T. Z., Wildt, A. R. (1994). Price, product information, and purchase intention: an empirical study. *Journal of the Academy of Marketing Science*, .22 (1), 16-27.

Chatelin, Y. M., Vinzi, V. E. & Tenenhaus, M. (2002). *State-of-art on PLS modeling through the available software'*. HEC Business School, Jouy-en-Josas.

Chin, W. W. (1998). The partial least squares approach for structural equation modeling. In G. A. Marcoulides (Eds.), *Modern methods for business research* (pp. 295–236). London: Lawrence Erlbaum Associates.

Cronin, J. J., Brady, M. K., & Hult, G. T. M. (2000). Assessing the effects of quality, value and customer satisfaction on consumer behavioral intentions in service environments. *Journal Of Retailing*, 76(2), 193-218.

Duman,T., & Yağcı, M. İ. (2006). Süpermarket Müşterilerinin Devamlı Alışveriş Niyetini Etkileyen Faktörler: Bir Model Denemesi, *ODTÜ Gelişme Dergisi*, 33,87-116.

Fornell, C. & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18, 39–50.

Grewal D., Monroe K. B., Krshnan R. (1998). The effects of price- comparison advertising on buyers' perceptions of acquisition value, transaction value and behavioral intentions. *Journal of Marketing*, 62, 46-59.

Götz, O., Liehr-Gobbers, K., & Krafft, M. (2010). Evaluation of structural equation models using the partial least squares (PLS) approach. In: V. Esposito Vinzi, W. W. Chin, J. Henseler&H.Wang(Eds.), *Handbook of partial least squares: Concepts, methods, and applications*. Berlin: Springer-Verlag.

Hellier, P.K., & Geursen, G.M., Carr, R.A., & Rickard, J.A. (2003). Customer repurchase intention: A general structural equation model, *European Journal of Marketing*, 37, 11/12, 1762 – 1800.

Hirschman, A.O. (1970). *Exit, voice, and loyalty – responses to decline in firms, organizations, and states*. Cambridge, MA: Harvard University Press.

Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least squares path modeling in international marketing, In Rudolf R. Sinkovics, Pervez N. Ghauri (Eds.) *New challenges to international marketing (advances in international marketing, volume 20)* (pp.277-319). Bingley: Emerald Group Publishing Limited.

Lee, L., Petter, S., Fayard, D., Robinson, S. (2011). On the use of partial path modeling in accounting research. *International Journal of Accounting Information Systems*, 12, 305-328.

Noyan, F., & Şimşek, G.G. (2011). Structural determinants of customer satisfaction in loyalty models: Turkish retail supermarkets. *Procedia-Social and Behavioral Sciences* , 30, 2134–2138.

Sirohi N., Mclaughlin E.W., Wittink D.R. (1998). A model of consumer perceptions and store loyalty intentions for a supermarket retailer. *Journal of Retailing*, 74(2), 223-245.

Tenenhaus, M., Esposito Vinzi, V., Chatelin, Y., & Lauro, C. (2005). PLS path modeling. *Computational Statistics and Data Analysis*, 48, 159–205.