Modeling consumers' intention to continue buying online when controlled for socio-demographic variables

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Abstract.
For studying consumers' intention to buy online, ECM-IT framework was employed. Consumers' behavioral intention is a function of both consumers' satisfaction with their decision to buy online goods and services and perceived usefulness of using the Internet in the buying process, while consumers' confirmation of initial expectations has a direct effect on both satisfaction and perceived usefulness. While ECM-IT was validated in various online consumer behavior models, the effect of control variables, such as consumers' gender, income and level of education was given little attention. Thus, this paper's aim is to test whether ECM-IT causal relationship will hold when accounted for consumers' socio-demographic variables. Three PLS-based SEM analyses were conducted for hypothesis testing.

Keywords: online buying, EDT-IT, structural equation modeling

INTRODUCTION

Online consumer behavior has gained considerable attention from researchers that took different approaches in trying to explain and predict why consumers buy online. As later studies focus on 81 consumers' adoption of the Internet in the buying process, more recent studies are more concerned explaining why consumers chose to continue buying online (Cheung et al, 2003).

These later area of research is focused on post-adoption behavior and usually employs Bhattacherjee's ECM-IT framework (Cheung et al, 2003), which postulates that consumers' satisfaction and perceived usefulness are the main determinants of continuance intention (Bhattacherjee, 2001).

ECM-IT causal relationships were validated in the context of online behavior by a number of significant researchers (e.g Atchariyachanvanich et al, 2006; Tsai and Huang, 2007; Chen et al, 2010; Jiang and Rosenbloom, 2004; Lee, 2010), thus the revalidation of the suitability of ECM-IT framework does not constitute a main research goal of this paper. Instead, this paper focuses on validating ECM-IT causal relationship when controlled for consumers' socio-demographic variables, such as gender, income and level of education. Based on the assumption that a parsimonious research framework should stand the control variables effect, socio-demographic variables are introduced in the model and their effects on the causal relationships are ascertained.

This is a new approach to studying continuance intention since there is a lack of focus on the effect of control variables within the ECM-IT framework. Control variables, usually represented by demographic variables, are not expected to influence the results of a structural equation modeling analysis (Kock, 2011). However, few researchers report the effect of control variables when modeling online consumer behavior.

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ECM-IT RESEARCH FRAMEWORK

Expectation Confirmation Model for IT use (ECM-IT) is an IS-related theory that have adapted Oliver's paradigm of expectations confirmation to study the specificity of individuals' intention to continue using various information technologies (Bhattacherjee, 2001).

ECM-IT postulates that post adoption, individuals will judge whether their initial expectations regarding the use of the IT are confirmed or disconfirmed. The confirmation of initial expectations will lead to an increased reported satisfaction with the IS use and increased perceived usefulness of the IS (Bhattacherjee si Premkumar, 2004).

On the other hand, satisfaction with IS use and perceived usefulness of the IS will determine individuals' intention to continue using the IS, leading to post-adoption continuance intention (Bhattacherjee si Premkumar, 2004).

RESEARCH MODEL AND HYPOTHESES

The research hypotheses are based on ECM-IT framework augmented with control variables: gender, income and level of education:
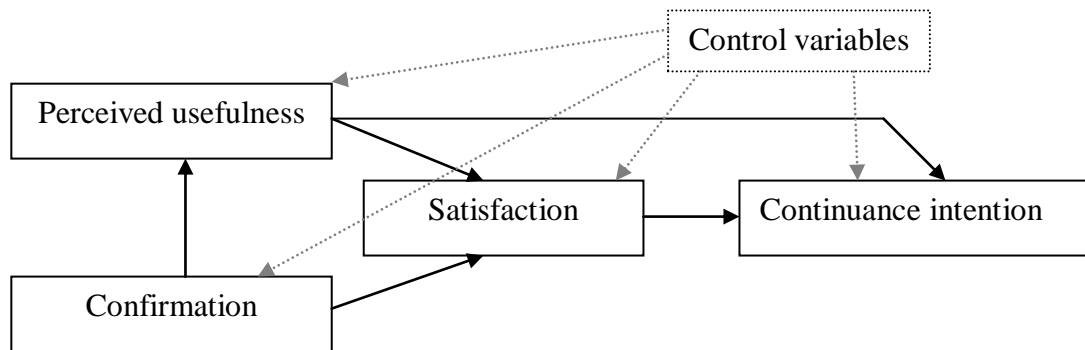
Figure 1. Research model (ECM-IT augmented with control variables)
Source: Bhattacherjee, 2001, p.356

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Hypothesis 1: There is a direct and positive relationship between the confirmation of consumers' initial expectations and consumers' satisfaction with their decision to buy online, regardless of consumers' gender, income or education.
Hypothesis 2: There is a direct and positive relationship between the confirmation of consumers' initial expectations and consumers' perceived usefulness of online buying, regardless of consumers' gender, income or education.
Hypothesis 3: There is a direct and positive relationship between consumers' perceived usefulness of using the Internet in the buying process and consumers' satisfaction with their decision to buy online, regardless of consumers' gender, income or education.

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Hypothesis 4: There is a direct and positive relationship between consumers' perceived usefulness of using the Internet in the buying process and consumers' intention to continue buying online, regardless of consumers' gender, income or education.

Hypothesis 5: There is a direct and positive relationship between consumers' satisfaction with their decision to buy online and consumers' intention to continue buying online, regardless of consumers' gender, income or education.

METHODOLOGY

Primary data used in this study was gathered using a web-based survey, as part of the PhD thesis data collection. The survey was designed using Lime Survey, an open source survey software tool written in PHP. The survey was hosted on its own domain: consumatorulonline.ro.

Each item was constructed as an affirmation to which respondents were asked to agree on a 1 (strongly disagree) to 7 (strongly agree) Likert scale. When data was first gathered, 98 valid responses were collected for the purpose of this study.

Each latent variable was measured as multiple item constructs and measurements were drawn from previous literature:

Latent Variable	Type	No. of items	Dimensions
Intention to continue buying online	First order formative	4	Intentions as expectations/plans/ wants/ stated intentions
Perceived usefulness	First order formative	4	Convenience/ Time savings / Lower prices / Variety of information
Satisfaction	First order reflective	4	Affective dimension of satisfaction
Confirmation	First order formative	3	Confirmation of initial expectations in pre-purchase/ purchase /post-purchase stage of the online buying process

Table 1. Measurements

DATA ANALYSIS AND RESULTS

The reliability and validity of the measurements, as well as the structural equation modeling was executed using WarpPLS 3.0 software due to its abilities in providing trustful results when using small amounts of data and its ability of differentiating between reflective and formative latent variables (Kock, 2011).

Measurements Reliability and Validity

The aim of testing the measurements for reliability and validity was to ensure the effectiveness of the measurements before running the structural equation modeling for hypotheses testing (Kline, 1998).

The analysis of three reliability coefficients: composite reliability (CR), Cronbach Alpha and average extracted variance (AVE) indicates that measurements have acceptable internal consistency since

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Cronbach Alpha's coefficients are greater than the critical value of 5 (Hair et al, 1998) and CR coefficients are greater than the critical value of 0.5 (Nunally, 1978).

Construct	Composite reliability (CR)	Cronbach Alpha Coefficients	Avergender extracted variance (AVE)
Intention	0.924	0.891	0.753
Satisfaction	0.916	0.834	0.732
Confirmation	0.896	0.824	0.742
Perceived usefulness	0.889	0.834	0.668

Table 2. Measurements reliability

Convergent validity was assessed by analyzing combined loadings and cross-loadings. Items with good convergent validity should load more inside a construct they load outside the construct (Jewell, 2011). Table 3 indicates good convergent validity of measurements.

	Perceived usefulness	Confirmation	Satisfaction	Intention	SE	P value
PU1	0.807	-0.047	0.045	0.051	0.084	<0.001
PU 2	0.794	0.156	-0.074	-0.08	0.098	<0.001
PU 3	0.831	0.069	-0.156	0.039	0.068	<0.001
PU 4	0.835	-0.171	0.182	-0.012	0.065	<0.001
C1	-0.117	0.789	0.342	0.011	0.09	<0.001
C2	0.058	0.904	-0.226	-0.011	0.072	<0.001
C3	0.045	0.888	-0.075	0.001	0.069	<0.001
S1	0.114	0.157	0.780	0.315	0.098	<0.001
S2	-0.156	0.055	0.857	-0.133	0.058	<0.001
S3	-0.04	-0.129	0.885	-0.027	0.082	<0.001
S4	0.089	-0.062	0.897	-0.121	0.079	<0.001
I1	0.074	0.099	-0.216	0.882	0.071	<0.001
I2	-0.042	0.01	-0.026	0.898	0.07	<0.001
I3	-0.073	-0.03	-0.111	0.837	0.082	<0.001
I4	0.041	-0.084	0.359	0.853	0.069	<0.001

Table 3. Measurements convergent validity

Divergent validity was assessed by comparing the square roots of AVE with correlations among the latent variables. A LV with good divergent validity should have square roots of AVE greater than any of its correlations with other LVs (Fornell and Larcker, 1981). Table 4 indicates good divergent validity of constructs.

	Perceived usefulness	Confirmation	Satisfaction	Intention
Perceived usefulness	0.817	0.297	0.404	0.407
Confirmation	0.297	0.861	0.708	0.647
Satisfaction	0.404	0.708	0.856	0.752
Intention	0.407	0.647	0.752	0.868

Table 4. Measurements divergent validity
Note: Square roots of average variances extracted (AVE's) shown on diagonal

Structural equation modeling
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In order to test the validity of ECM-IT in the context of online buying, a PLS-based structural equation modeling was performed. The significance of the path coefficients and their associated p values are given below:

	Perceived usefulness	Confirmation	Satisfaction	Intention
Perceived usefulness		0.337 (p<0.001)		
Confirmation				
Satisfaction	0.209 (p=0.008)	0.656 (p<0.001)		
Intention	0.132 (p=0.043)		0.703 (p<0.001)	

Table 4. Measurements divergent validity

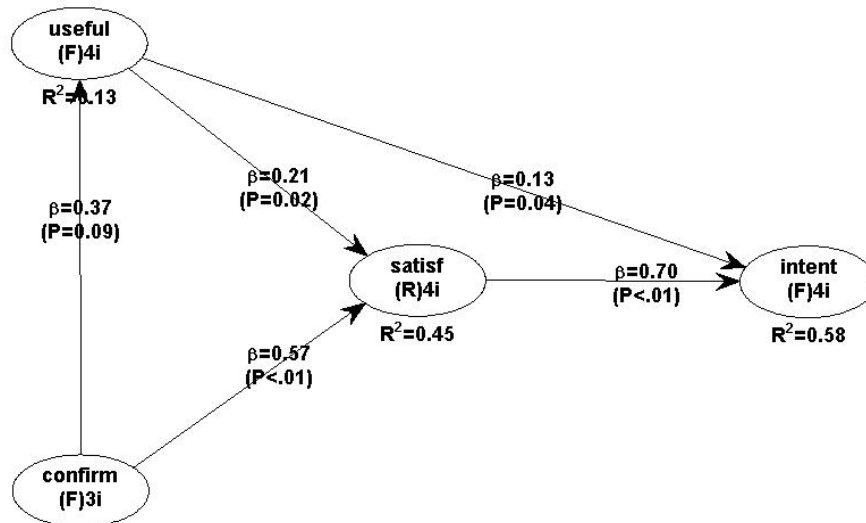Figure 2. PLS-based SEM analysis

Thus, all ECM-IT causal relationships are supported in the context of online buying for p>0.05. Consumers' intention to continue buying online is determined especially by consumers' satisfaction, as a post-evaluative judgment after using the Internet to buy goods and services (β=0.703). Perceived usefulness of online buying on consumers' continuance intention is relatively small, with a β=0.132 at p<0.05. Initial expectations' confirmation and perceived usefulness of online buying are the main determinants of consumers' satisfaction with a β=0.656 and β=0.209, respectively. The proposed determinants of consumers' intention to buy online managed to explain 58% of the variance in continuance intention.

ECM-IT associations when controlled for gender. The binary variable accounting for consumers' gender: female (1) and male (2) was introduced in the SEM analysis. According to Kock's approach, causal link from 'gender' variables to all endogenous variables in the model were drawn (Kock, 2011). I further test if the path coefficients between the LVs are still significant at p<0.05, when 'gender' is

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introduced in the model. Based on the PLS-based SEM analysis (see Table 5), we can say that ECM-IT associations are significant regardless of gender.

	Perceived usefulness	Confirmation	Satisfaction	Intention	Gender
Perceived usefulness		0.339 (p<0.001)			0.179 (p<0.016)
Confirmation					
Satisfaction	0.188 (p=0.018)	0.669 (p<0.001)			0.088 (p=112)
Intention	0.125 (p=0.05)		0.703 (p<0.001)		0.038 (p=0.282)
Gender					

Table 5. ECM-IT associations when controlled for gender

ECM-IT associations when controlled for income. The variable accounting for consumers' income: low income (1) average income (2) and high income (3) was introduced in the SEM analysis. According to Kock's approach, causal link from 'income' variable to all endogenous variables in the model were drawn (Kock, 2011). I further test if the path coefficients between the LVs are still significant, when 'income' is introduced in the model. Based on the PLS-based SEM analysis (see Table 6), we can say that ECM-IT associations are significant regardless of income.

	Perceived usefulness	Confirmation	Satisfaction	Intention	Income
Perceived usefulness		0.316 (p<0.001)			0.143 (p=0.062)
Confirmation					
Satisfaction	0.211 (p=0.008)	0.660 (p<0.001)			-0.019 (p=0.403)
Intention	0.150 (p=0.025)		0.717 (p<0.001)		-0.127 (p=0.031)
Income					

Table 6. ECM-IT associations when controlled for income

ECM-IT associations when controlled for education. The binary variable accounting for consumers' education: consumers with no university degree (1) and consumers with university degree (2) was introduced in the SEM analysis. According to Kock's approach, causal link from 'education' variables to all endogenous variables in the model were drawn (Kock, 2011). I further test is the path coefficients between the LVs are still significant, when 'education' is introduced in the model. Based on the PLS-based SEM analysis (see Table 5), we can say that ECM-IT associations are significant regardless of education.

	Perceived usefulness	Confirmation	Satisfaction	Intention	Income
Perceived usefulness		0.337 (p<0.001)			0.017 (p=0.428)

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Confirmation					
Satisfaction	0.210 (p=0.008)	0.658 (p<0.001)			-0.055 (p=0.202)
Intention	0.132 (p=0.041)		0.702 (p<0.001)		-0.019 (p=0.392)
Income					

Table 6. ECM-IT associations when controlled for education

CONCLUSION

The results of the empirical investigation among Romanian online consumers once more validate the suitability of the Expectation Confirmation Model for IT use (ECM-IT) in the context of online buying. Consumers' intention to continue buying online is jointly determined by consumers' satisfaction with the online buying process and consumers' perceived usefulness of using the Internet when buying goods and services for private use.

The strong, direct and positive relationship between consumers' satisfaction and continuance intention indicate that satisfied consumers are more willingly to continue buying online than unsatisfied consumers. Buying online is an alternative to the traditional buying, which has many relative advantages, but most of all, it is a choice. Once consumers have made several online purchases they can judge whether they are satisfied with their decision to appeal to online buying. Their intention to continue or discontinue the adoption of buying online depends on their level of satisfaction.

Consumers' satisfaction on the other hand is mostly determined by the confirmation of their initial expectations. Before buying online consumers form some initial expectations about the ease of finding relevant information, the quality of information, the ease and quickness of ordering, the security of online, the reliability of the delivery and the trustfulness of online vendors in terms of product performance and returning policies. Meeting consumers' initial expectations was captured under the concept of expectations confirmation, the strongest predictor of online consumers' satisfaction.

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Perceived usefulness may have a strong and direct impact on consumers' intention to adopt online buying, as reported in many previous studies, but its influence decreases in the context of continuance. If online buying advantages such as convenience, time and money savings, greater selective power due to the abundance of information constitute the main reasons consumers initially choose to buy online, in post adoption phase what matters the most is satisfaction.

These being said, consumers' intention to continue buying online can be modeled according to ECM-IT framework. The validation of ECM-IT framework was, however, a second aim of this paper, since I began with the assumption that ECM-IT causal relationships will hold due to previous literature revalidation (e.g Atchariyachanvanich et al, 2006; Tsai and Huang, 2007; Chen et al, 2010; Jiang and Rosenbloom, 2004; Lee, 2010).

Most of this paper focuses on validating ECM-IT assumptions when controlled for consumers' socio-demographic variables. In order to prove that initial causal relationships will be significant regardless of socio-demographic variables, I have run three independent SEM analyses, one for each of the proposed socio-demographic variables: gender, income and level of education.

The first SEM analysis with 'gender' control variable included in the model, indicates that all ECM-IT causal relationships are significant at p<0.05 when controlled for gender. Thus, regardless of consumers' gender, whether they are females or males, their intention to continue online buying is mainly

determined by satisfaction and perceived usefulness of using the Internet in order to buy goods and services.

The second SEM analysis with 'income' control variable included in the model, indicate that all ECM-IT causal relations are significant at $p<0.05$ even though consumers may have a low income, an average income or high income.

Finally, the third SEM analysis yields the same results: ECM-IT causal relationships are significant, regardless of consumers' level of education.

Running three PLS-based SEM analyses, I have validated initial research hypotheses, concluding the reliability of Expectation Confirmation Model for IT use in the context of online buying since control variables did not influence the results of the SEM analysis, namely the significance of the path coefficients.

RESOURCES

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