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Evaluation of factors affecting users' satisfaction with online group buying based on SET

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Abstract

The topic of this paper is the evaluation of the factors that affect users' satisfaction with online group buying. Social exchange theory was used to identify these factors. Reciprocity, reputation and trust, proposed by social exchange theory, and vendors' creativity and customers' satisfaction with the purchase can be included among these factors. The aim of this paper is to evaluate the factors affecting customer satisfaction with online group buying and to validate the proposed factor model in the conditions of the Czech Republic. The method of structural equation modelling is used to evaluate the factors and validate the model. It is found that the proposed model is not optimal in the Czech conditions. The results confirm that trust, vendors' innovations and creativity and customers' pleasure, contentment and delight are the most important factors for Czech customers.

Keywords

Online group buying, satisfaction, social buying, social exchange theory, structural equation model

JEL Classification: M31, M37

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1. Introduction

Online group buying has become popular all over the world with the emergence of US-based sites such as Groupon, launched in 2008. The online group buying market is growing at a fast rate throughout the world (Erdogmus and Cicek, 2011). Group buying refers to social or collective shopping whereby goods and services can be purchased at significantly reduced prices when enough buyers participate in the purchase. The transaction can proceed only when the required number of buyers is reached (Shiau and Luo, 2012). Customers can buy goods, adventure events, gastronomy, services, such as wellness, hair styling, massages, etc., or holidays in online group buying auctions (Michl, 2013). Online group buying is a new phenomenon that takes advantage of both online marketing and social media influence (Erdogmus and Cicek, 2011).

Online group buying auctions are mostly used by young people aged between 18 and 34 and females prefer to buy from daily campaigns more than males. In addition to this, users whose yearly incomes are more than \$100,000 and who are university graduates use group buying websites more often (Erdogmus and Cicek, 2011).

When Czech people want to buy something with a discount, online group buying auctions are the third most common place for them to look. The most usual places are leaflets and seasonal sales in shops (Michl, 2013).

The first online group buying auctions were launched in 2008/2009 in the Czech Republic. The biggest increase in this method of purchasing occurred in 2010 and 2011. There are many providers of online group buying auctions nowadays in the Czech Republic.

Therefore, vendors should try to achieve the maximum user satisfaction with purchases. A high consumer satisfaction rate contributes significantly to consumer loyalty to the service provider (Zamazalová, 2009). Consumer satisfaction helps companies to establish long-term relationships with consumers (Shiau and Luo, 2012).

There are different reasons for online group buying intentions. The monetary savings are one of the most common reasons for participating in online group buying. The primary motivator for engaging in online group buying is the discount, as well as the rate of the discount (Erdogmus and Cicek, 2011). Users of online group buying auctions also look for high-quality goods and services for favourable prices. Group buying also decreases the perceived risk and increases the perceived security in the process of making purchase decisions. This motivation comes from the idea that there must be a good reason for many people to purchase this product (Wang et al., 2013).

Social exchange theory (SET) can also be used to identify the factors that affect users' satisfaction with online and offline buying.

Reciprocity, reputation and trust can be involved between these factors according to social exchange theory in the case of group buying. We can also include vendors' creativity and factors of satisfaction such as pleasure, contentment and delight. Satisfaction, trust and vendors' creativity influence the intention of buyers to engage in online group buying (Shiau and Luo, 2012). See Figure 1.

The aim of this paper is to evaluate the factors affecting customer satisfaction with online group buying and to validate the proposed factor model in the conditions of the Czech Republic. The validated part of the model is shown in black, and the invalidated part is grey (Figure 1).

2. Theoretical background of social exchange theory

Social exchange theory, originating in the 1950s and based on psychology, was initially developed for analysing human behaviour and was later applied to understanding organizational behaviour. Social exchange theory states that people and organizations interact to minimize their costs and maximize their rewards. According to SET, individuals typically expect reciprocal benefits (namely personal affection, trust and gratitude) and economic returns when they act according to social norms (Shiau and Luo, 2012).

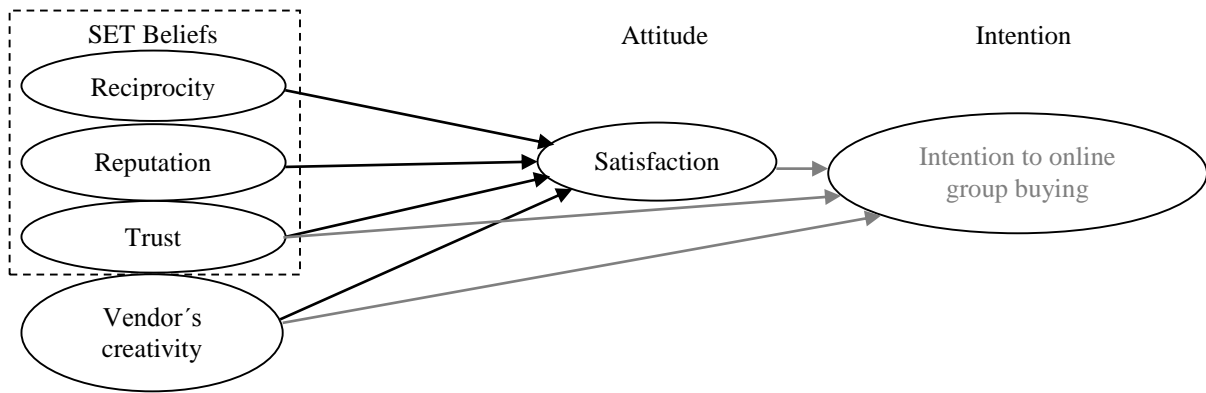


Figure 1 Proposed model by Shiau and Luo (2012)

Reciprocity can be interpreted as quid pro quo behaviour. Reputation is derived from the degree to which a person believes that social interaction potentially enhances personal reputation. Trust is frequently defined as the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party. Creativity refers to the Latin word *creatus*. Creative products are often characterized by novelty and appropriateness; otherwise, we can consider them as general products. Creative products should also have a competitive advantage (Shiau and Luo, 2012).

Marketing research uses *satisfaction* to measure customer satisfaction after a purchase. Research has stressed the differences between consumer expectations and actual satisfaction. Satisfaction affects purchase intention and has a significant influence (Shiau and Luo, 2012).

3. Research methodology

The purpose of this research was the identification of factors influencing buyers' satisfaction with online group buying. The factors of SET supplemented with vendors' creativity and satisfaction were used. A structural equation model (SEM) was used to validate the proposed model in the Czech conditions and also to identify the most significant factors that affect users' satisfaction.

The data were obtained in online questionnaire research. This method was chosen because of its connection with the research concern. The population was all online group buying auction users, meaning everyone who has ever bought at this auction. The sample consisted of 115 respondents; the structure of the sample was equal to the structure of the online group buying auction consumers. The respondents expressed

where 1 corresponded to a positive statement and 5 corresponded to a negative statement.

A structural equation model (SEM) was used to validate the proposed relationships between the variables in the model. These variables can be observed and unobserved, and every unobserved variable usually consists of several observed variables. Residual variables can also be presented in the model. It shows errors of estimation or errors of measurement (Urbánek, 2000).

3.1 Structural equation model

Nachtigall et al. (2003) claim that a general structural model consists of two parts – a measurement model and a structural model.

A *measurement model* comprises the relations between the unobserved variables. If one of the unobserved variables constitutes an unobserved variable, it is called a proxy variable. It is called an indicator if it is measured by several observed variables (Urbánek, 2000).

Observed variables correlate only with measured unobserved variables, so the *variance explained by the linear dependency of the observed variable on the unobserved variable represents every 'valuable' variance of the observed variable* (Urbánek, 2000). The model does not interpret the residual segment of the variance. The residual variance can be considered as an unobserved variable.

The measurement model can be algebraically defined as two systems of equations in matrix form (de Oña et al., 2013):

$$\vec{x} = \Lambda_x \vec{\xi} + \vec{\delta}, \tag{1}$$

$$\vec{y} = \Lambda_y \vec{\eta} + \vec{\varepsilon}, \tag{2}$$

where \vec{x} is the vector of the indicator for the vector of unobserved variable $\vec{\xi}$, \vec{y} stands for the vector of the indicator for the vector of unobserved variable $\vec{\eta}$, $\vec{\xi}$ is the vector for the unobserved exogenous variable, $\vec{\eta}$ is the vector for the unobserved endogenous variable,

Λ_x and Λ_y are the matrixes of the structural coefficients for the relations of variables' vectors \bar{x} and $\bar{\xi}$ and variables \bar{y} and $\bar{\eta}$, and $\bar{\delta}$ and $\bar{\varepsilon}$ are the vectors of residual variables for the vectors \bar{x} and \bar{y} .

The covariation matrixes Θ_δ and Θ_ε of the vectors of the residual variables are also included in the measurement model. These matrixes are usually diagonal, and residual variables do not correlate in the model (de Oña et al., 2013).

A *structural model* depicts the relations between the unobserved variables. This model detects which unobserved variable is independent (exogenous) and which unobserved variable is dependent (endogenous). We can say that the exogenous variable is not influenced by any of the independent variables, whilst the endogenous variable is influenced by other variables. The structural model can be interpreted as follows (de Oña et al., 2013):

$$\bar{\eta} = B\bar{\eta} + \Gamma\bar{\xi} + \bar{\zeta}, \quad (3)$$

where B and Γ are the matrixes of the structural coefficients of the unobserved endogenous (exogenous) variables and $\bar{\zeta}$ are the measurement errors (disturbances).

The *validity of the proposed model* can be proven with multiple chi-squared tests and the rate of change of a conditional mean is interpreted as a regression coefficient. Standardized regression coefficients should take values of 0.5 (optimally 0.7) and higher if the relations between the variables are important (Hair et al., 2010). The root mean square error of approximation (RMSEA) index or comparative fit index (CFI) can be named as being among the most frequently used. The normed fit index (NFI) measures the possibilities of improvements in the model (de Oña et al., 2013).

Here, default, independence and saturated models are used during the calculation. The default model means the researchers' structural model. The independence model is one of complete independence of all the variables in the model, meaning that all the correlations of all the variables are zero. The independence model can also be called the uncorrelated variables model and is the most restricted. Most of the goodness-of-fit indexes take the value of 0 for the independence model. The saturated model, on the other hand, is one in which the number of estimated parameters equals the number of data points. That means that variance and covariance exist among the observed variables. The saturated model is the least restricted. Most of the goodness-of-fit indexes take the value of 1 for a saturated model. If the saturated model has a parsimony ratio of 0, the independence model has a parsimony ratio of 1 (Byrne, 2009).

The RMSEA index can be calculated as

$$RMSEA = \sqrt{\frac{(\chi^2 - df/k)^2}{(N-1)}}, \quad (4)$$

where χ^2 is the chi-square, df is the degrees of freedom, k is the number of estimated (free) parameters and N is the sample size; see Hair et al. (2010).

The RMSEA index should take a value of 0.08 up to 0.10 and lower. The lower its value, the more the proposed model fits the real data. Models with an RMSEA index higher than 0.10 should be rejected; see Urbánek (2000).

The comparative fit index (CFI) can be algebraically defined as

$$CFI = \frac{P_N}{P_{N_b}}, \quad (5)$$

where P_N and P_{N_b} are the parameters of noncentrality for the estimated and the basic model. The CFI ranges between 0 and 1 and the value of this index should be close to 1.000 for the optimal model (Urbánek, 2000).

The normed fit index (NFI) can be interpreted as

$$NFI = 1 - \frac{F}{F_b}, \quad (6)$$

where F is the minimum value of the loss function for the estimated model and F_b is the value of the loss function as the minimum for the basic model (Urbánek, 2000).

The possible range of NFI values is 0 to 1. The NFI index should also be close to 1.000. We consider that a model with an NFI lower than 0.9 can be improved (Hooper et al., 2008).

4. Data analysis and results

First the variables in the model are specified in this part of paper, and then the validation of the proposed model is described. Validation consists of the validation of the measurement model and the validation of the structural model as well as the evaluation of the goodness-of-fit indexes.

4.1 Specification of variables in the model

There are 26 variables in the tested model. The number of observed variables is 21 and the number of unobserved variables is 26, including 21 residual variables. The following Table 1 shows the variables in the structural equation model.

The unobserved variable *Reciprocity* is measured by the observed variables Q37–Q41. These observed variables express the belief that sharing information with an online group buying vendor will lead to future requests for knowledge being met. Specifically, the following factors were evaluated:

- Q37 when I share my information about online group buying, I believe that I will receive other information from online group buying vendors,
- Q38 when I share my information about online group buying, I expect to receive the response that I need from online group buying vendors,
- Q39 when I share my information about online group buying, I believe that my queries for information on online group buying vendors will be answered in future,
- Q40 I find that my participation in the sharing of information about online group buying can be advantageous to me and from online group buying vendors,
- Q41 I think that participating in the sharing of information on online group buying vendors can improve the reciprocal benefit.

Table 1 Variables of the structural equation model

Type of variable	Label of variable	Name of variable in the model
Observed variables	Q37–Q41	Reciprocity
	Q42–Q46	Reputation
	Q47–Q49	Trust
	Q50–Q53	Vendor's creativity
	Q54–Q57	Satisfaction
Unobserved variables	Reciprocity	Reciprocity
	Reputation	Reputation
	Trust	Trust
	Vendor's creativity	Vendor's creativity
	Satisfaction	Satisfaction
Residual variables	e1–e21	

The second unobserved variable, *Reputation*, is measured by five observed variables, Q42–Q46. We measured whether the feeling of an increase in reputation is due to the sharing of information on an online group buying vendor. Specifically, we explored the respondents' perceptions about the following:

- Q42 sharing my information on online group buying vendors improves my image,
- Q43 people in our life who share their information on online group buying have more prestige than those who do not,
- Q44 sharing my information on online group buying vendors improves others' recognition of me,
- Q45 I earn respect from others by sharing my information on online group buying vendors,
- Q46 sharing my information about online group buying would enhance my personal reputation regarding online group buying vendors.

The third unobserved variable, *Trust*, is measured by the observed variables Q47–Q49. These observed

variables evaluate trust; trust is a consumer's confident belief in online group buying vendors' honesty towards the consumer. Specifically, the following factors were evaluated:

- Q47 online group buying gives me a feeling of trust,
- Q48 I have trust in online group buying vendors,
- Q49 the online group buying vendor gives me a trustworthy impression.

Another variable, *Vendors' creativity*, is measured by four observed variables, Q50–Q53. These observed variables evaluate the vendors' creativity, which involves coming up with new ideas and new products to meet consumers' demands. To be precise, we explored the respondents' perceptions about the following:

- Q50 the online group buying vendor suggests new product ideas,
- Q51 the online group buying vendor often has new ideas about how to promote products,
- Q52 the online group buying vendor often has a new approach to sell products,
- Q53 the online group buying vendor develops new ways to meet consumer demands.

The last unobserved variable, *Satisfaction*, is measured by four observed variables, Q54–Q57. We investigated the consumer perceptions about prior shopping experience with online group buying vendors. Specifically, the following factors were evaluated:

- Q54 I feel very satisfied with my overall shopping experience with online group buying vendors,
- Q55 I feel very pleased with my overall shopping experience with online group buying vendors,
- Q56 I feel very contented with my overall shopping experience with online group buying vendors,
- Q57 I feel absolutely delighted with my overall shopping experience with online group buying vendors.

4.2 Validity of the model

The presented values of the regression coefficients and goodness-of-fit indexes were calculated in SPSS Amos 20.

Figure 2 in the appendix shows the relations between the variables in the measurement model according to (1) and (2) and the relations between variables in the structural model according to (3).

Validity of the measurement model

The relations between the observed and the unobserved variables in the measurement model were tested. The following Table 2 shows the values of the standardized regression coefficients in the measurement model. We used the significance level of 0.05.

Table 2 Values of the standardized regression coefficients in the measurement model

Unobserved variable	Observed variable	Significance	Standardized regression coefficients
Reciprocity	Q37	0.321	0.736
	Q38	0.338	0.787
	Q39	0.340	0.751
	Q40	0.311	0.579
	Q41	0.336	0.244
Reputation	Q42	0.018	0.550
	Q43	0.007	0.637
	Q44	0.003	0.778
	Q45	0.000	0.860
	Q46	0.004	0.726
Trust	Q47	0.114	-0.382
	Q48	0.000	0.801
	Q49	0.000	0.792
Vendor's creativity	Q50	0.003	0.604
	Q51	0.000	0.910
	Q52	0.000	0.949
	Q53	0.000	0.892
Satisfaction	Q54	0.000	0.851
	Q55	0.000	0.924
	Q56	0.000	0.944
	Q57	0.001	0.751

All the variables that create the unobserved variable Reciprocity are not statistically reliable because the significance level is higher than the tested significance level of 0.05. In addition, the variable Q47, *Online group buying gives me a feeling of trust*, is not statistically reliable. All these variables can influence the validity of the proposed model.

If we consider 0.5 as the minimum value for a significant relation between variables, all the tested variables except Q41 and Q47 are significant. The variable *I think that participating in the sharing of information on online group buying vendors can improve the reciprocal benefit* and the variable *Online group buying gives me a feeling of trust* can influence the validity of the proposed model, because these variables are not statistically significant.

The factor *When I share my information about online group buying, I expect to receive the response I need from online group buying vendors* (Q38) is the most important variable of the variables creating the unobserved variable Reciprocity. The factors *Sharing my information on online group buying vendors improves others' recognition of me* (Q44) and *I earn respect from others by sharing my information on online group buying vendors* (Q45) are the most

important factors influencing the unobserved variable Reputation. All the variables tested for the variable Reputation are statistically reliable.

The factors *I have trust in online group buying vendors* (Q48) and *The online group buying vendor gives me a trustworthy impression* (Q49) are the most important indicators of the unobserved variable Trust. As mentioned above, the variable *Online group buying gives me a feeling of trust* can influence the validity of the proposed model, because this variable is not statistically significant and reliable.

We can include variables Q51, Q52 and Q53 among the variables that are the most important for the unobserved variable Vendors' creativity. These variables tested the respondents' opinions about *The online group buying vendor often has new ideas about how to promote products* (Q51), *The online group buying vendor often has a new approach to sell products* (Q52) and *The online group buying vendor develops new ways to meet consumer demands* (Q53). All these variables are statistically reliable.

The unobserved variable Satisfaction is the most influenced by the variable *I feel very pleased with my overall shopping experience with online group buying vendors* (Q55) and the variable *I feel very contented with my overall shopping experience with online group buying vendors* (Q56). Both these variables are also statistically reliable.

Validity of the structural model

The relations between unobserved endogenous and unobserved exogenous variables in the structural model were tested. The following Table 3 shows the values of the standardized regression coefficients in the structural model. We used the significance level of 0.05.

Table 3 Values of standardized regression coefficients in the structural model

Unobserved endogenous variable	Unobserved exogenous variable	Significance	Standardized regression coefficients
Satisfaction	Reciprocity	0.319	-0.569
	Reputation	0.068	0.309
	Trust	0.000	0.630
	Vendor's creativity	0.010	0.429

If we consider the significance level of 0.05, the relation between the unobserved variable Trust and the unobserved variable Satisfaction and the relation between the variable Vendors' creativity and the variable Satisfaction are statistically reliable. The variable Trust is more important than the variable Vendors' creativity because the value of the standard-

ized regression coefficient is higher for the variable Trust; see Table 3.

We can consider the relation between the unobserved variable Reciprocity and the unobserved variable Satisfaction to be not statistically reliable. Furthermore, the relation between the unobserved variable Reputation and the unobserved variable Satisfaction is not statistically reliable. The values of significance are higher than the tested value of the significance level of 0.05. These errors can also affect the validity of the proposed model.

Goodness-of-fit indexes of the proposed model

We used the RMSEA index, comparative fit index (CFI) and normed fit index (NFI) to validate the proposed model.

The RMSEA index for this proposed model takes the value of 0.328; see Table 4. The RMSEA index is calculated as (4).

Table 4 RMSEA index for the tested model

Model	RMSEA
Default model	0.328
Independence model	0.374

The RMSEA index should take a value of 0.08 up to 0.10 and lower, so this proposed model is not optimal according to this index. This model should be improved to fit the real data better.

The CFI and NFI indexes also show that the proposed model is not optimal; see Table 5. The CFI index is calculated as (5) and the NFI index is calculated as (6).

Table 5 CFI and NFI indexes for the tested model

Model	NFI	CFI
Default model	0.268	0.320
Saturated model	1.000	1.000
Independence model	0.000	0.000

The CFI index of the tested model takes the value of 0.32. This is a very low value. In addition, the NFI index, which takes the value of 0.268, shows that the model can be and should be improved. According to the NFI index, the proposed model fits the real data with 27%. This means that there are possibilities to improve the model and obtain a better fit to the real data.

4.3 Model improvement and future research

Some possibilities are described for improvement because of the non-optimality of the tested model. Some suggestions for research in the future are also mentioned.

Model improvement

According to the goodness-of-fit indexes used, the RMSEA, NFI and CFI, the proposed model is not optimal and should be modified to fit the real data better.

Some variables could be excluded from the model of measurement. As mentioned above, all the variables that are not statistically reliable should be excluded. These are the variable *Online group buying gives me a feeling of trust* (Q47) and all the variables creating the unobserved variable Reciprocity, namely *When I share my information about online group buying, I believe that I will receive other information from online group buying vendors* (Q37), *When I share my information about online group buying, I expect to receive the response I need from online group buying vendors* (Q38), *When I share my information about online group buying, I believe that my queries for information on online group buying vendors will be answered in future* (Q39), *I find that my participation in the sharing of information about online group buying can be advantageous to me and from online group buying vendors* (Q40) and *I think that participating in the sharing of information on online group buying vendors can improve the reciprocal benefit* (Q41). The significance of these variables is higher than the tested significance level of 0.05.

The variable *I think that participating in the sharing of information on online group buying vendors can improve the reciprocal benefit* (Q41) and the variable *Online group buying gives me a feeling of trust* (Q47) are not appropriate variables for this model in the Czech conditions, which was also confirmed by the standardized regression coefficients. The values of the standardized regression coefficients of these two variables are lower than 0.5.

Furthermore, in the structural model, there are some concerns leading to low validity of the proposed model. The unobserved variable Reciprocity should be excluded from the model because the significance of this variable is higher than the tested significance level of 0.05. In addition, the standardized regression coefficient of the variable Reciprocity is lower than 0.5.

The same situation leads to the exclusion of the unobserved variable Reputation, but excluding this variable is not so important. It is possible that excluding the observed variable *Online group buying gives me a feeling of trust* (Q47) mentioned above increases the validity of this unobserved variable. The variable Reputation also includes variables that have to be in the model, for example *I earn respect from others by sharing my information on online group buying vendors* (Q45).

Future research

There are also some opportunities for future research in addition to excluding the variables mentioned above. It is possible to use factor analysis to estimate the basic model when all the observed variables are included. This proposed basic model has to be tested by a structural equation model to validate the model.

When the model of factors affecting users' satisfaction with online group buying is optimal, it is important to continue with the research area concerning the intention to engage in online group buying. This research area is not included in this paper; see Figure 1.

5. Conclusion

This paper discusses the factors affecting customers' satisfaction with online group buying. Social exchange theory was used to identify these factors. The factors reciprocity, reputation and trust are groups of variables that influence users' satisfaction with online group buying according to this theory. It was found out in the literature review that these factors coming from this theory can be extended with vendors' creativity. The aim of this paper was to evaluate the factors affecting customers' satisfaction with online group buying and to validate the proposed factor model in the conditions of the Czech Republic.

This paper included the theoretical background of online group buying as well as social exchange theory, which is the base of the proposed model. The proposed model was validated with a structural equation model. The theoretical background of this method is also part of this paper. The data that were analysed came from online questioning. The respondents were heavy users of online group buying auctions. Goodness-of-fit indexes, specifically RMSEA, CFI and NFI, were used to validate the way in which the proposed model fits the real data.

According to the goodness-of-fit indexes used, we consider the proposed model not to be optimal in the conditions of the Czech Republic. The fit of the real data and the model is too low and there are opportunities to improve the model that are mentioned in the paper. We cannot consider all the unobserved variables – Reciprocity, Reputation, Trust and Vendors' creativity – to be statistically reliable.

Czech consumers who engage in online group buying do not feel reciprocal benefits when they share some information about online group buying auctions or they engage in another action. In addition, the degree to which a person believes that social interaction potentially enhances personal reputation is not a very important factor for Czech users. Furthermore,

the factors describing users' image and reputation when they share information about online group buying are the indicators with the lowest impact on the Czech users' satisfaction.

Czech users' satisfaction with online group buying is affected the most by the variables Vendors' creativity and Trust. The unobserved variable Vendors' creativity is the second most important indicator. The unobserved variable Trust is the most important indicator that affects users' satisfaction with online group buying in the conditions of the Czech Republic.

Additionally, the observed variable *I feel very pleased with my overall shopping experience with online group buying vendors* (Q55) and the variable *I feel very contented with my overall shopping experience with online group buying vendors* (Q56) are very important for Czech users' satisfaction with online group buying.

Online group buying vendors should increase buyers' trust in this method of purchasing. It is possible to recommend money refunds if there is a problem with the service, insurance of vouchers or withdrawing from the contract after a longer period than 14 days.

Online group buying vendors should be innovative. They should think about new ways of promoting products and services and they should adopt a new approach to sell products.

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Appendix

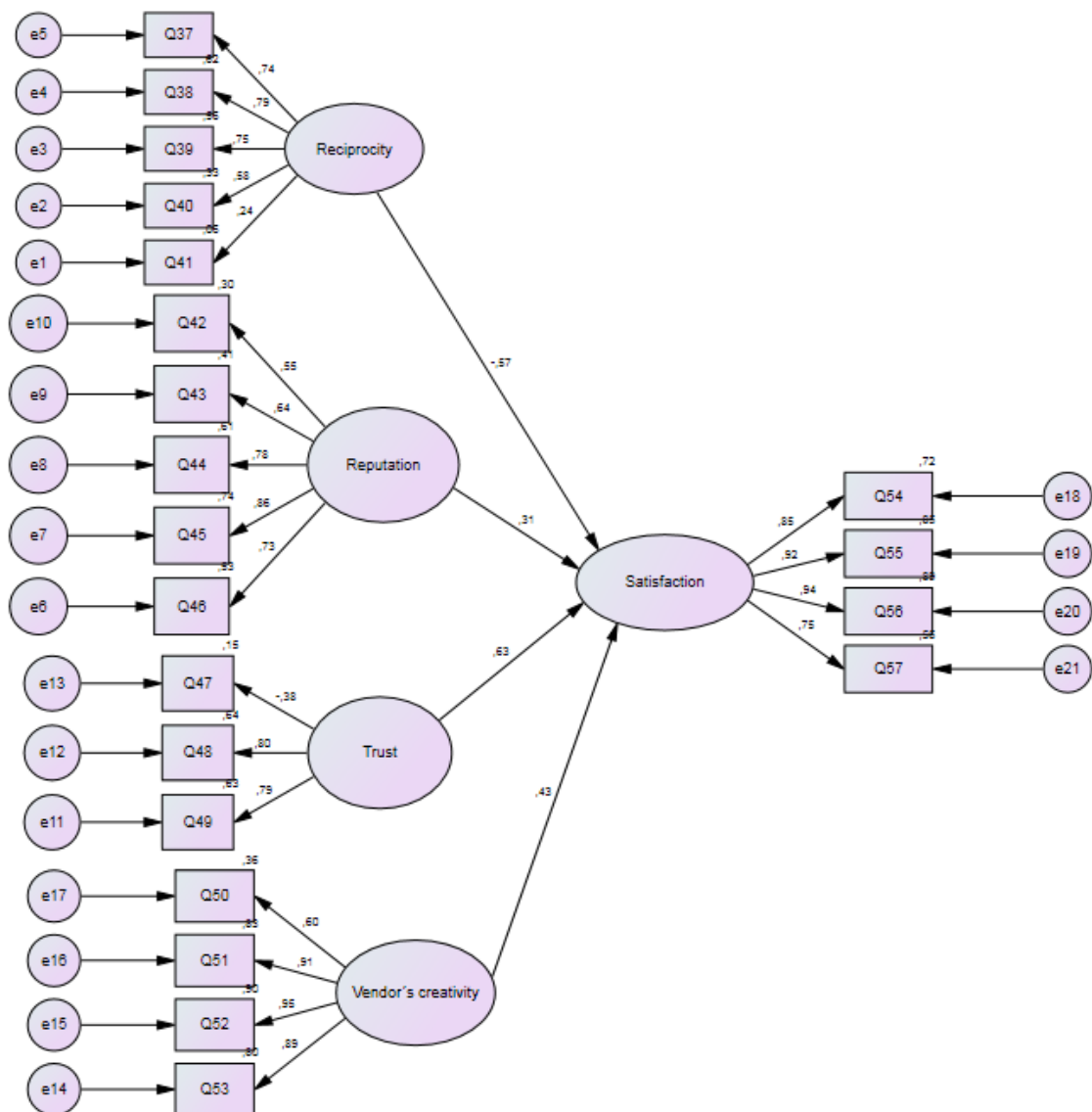


Figure 2 Regression coefficients of the measurement and the structural model

