

## A STRUCTURAL MODEL DESCRIBE CHINESE TRADESMEN ATTITUDES TOWARDS GREEK STUDENTS CONSUMPTION BEHAVIOR

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**Abstract:** *This study tests evaluates 43 Chinese tradesmen opinios describe the main factors that influnce Greek consumers' behavior. A structural model was constructed to represent the relationship between consumer components. The model was tested for its Convergent and Discriminant Validity. Moreover it was tested for its reliability and construct reliability. The findings from this study may be used by Chinese tradesmen to develop their marketing campains and customers.*

**Keywords:** *Validity, reliability, attitudes, Chinese products, Loyalty*

**JEL Classification Codes:** C52, D12

### 1. THEORETICAL FRAMEWORK

In the new era of globalization of business an increased competition among domestic and multinational firms in both foreign and domestic markets has appeared (Netemyer, 1991). In Europe, there is a trend of street illegal merchants of Chinese products and this strongly influences the local markets. In Greece, these Chinese merchants have a bad impact on the local economy, especially in recent economic crisis period, because they sell their products in extremely cheap prices and hence, they create problems to Greek merchants who cannot overcome this kind of competition. Nowadays, a new scene is emerged as many Chinese people started their own businesses in Thessaloniki and as a result a serious decrease of Greek products' sales appeared. Internationally, many studies had been made aiming to determine the predictors of consumers' behavioral intention to buy imported and domestic products (Chung and Pysarchik, 2000). According to Han and Vem (1988) products from developing countries were perceived to be of quite high quality (Han 1988) but consumers in all countries can have plenty choices of purchase options (Netemyer, 1991).

In the market literature many studies have study the influences brand name, trust, and brand equity on perceptions of customer loyalty (Gommans et al., 2001; Taylor et al., 2004). In addition, the concept of brand loyalty has been studied in every detail in traditional marketing literature concerning two different dimensions of the concept that are behavioral and attitudinal loyalty (Gommans et al., 2001, Baldinger and Rubinson, 1996). Laurent and Kapferer (1985) and Hunter et al. (2004) argued that the concept of risk perception as a construct that includes risk importance and risk probability is also a major factor that has influence to a market behavior. Perceived risk was initially defined by Bauer (1960) and includes two components, namely, uncertainty and adverse consequences. Perceived risk is another important factor related to consumer behaviour (Cox, 1967; Jøsang and Lo Presti, 2004). Jøsang and Lo Presti argued that both risk and trust are factors for making decisions in an uncertain environment. Moreover, the conceptualisation of perceptions of quality is among the most important issues in the marketing literature (Brady and Cronin, 2001).

Thus the present study evaluates the relations between Intention to buy, Trust, Risk, Product price, Perceived quality, Satisfaction and Loyalty in relation to Chinese products and Chinese market in Greece from 43 Chinese tradesmen point of view.

## **2. PURPOSE OF THE STUDY**

The present study examines the validity and reliability of an instrument (a structural equation model) designed for measuring Chinese tradesmen attitudes for Greek customers' consumption behavior towards Chinese products. Specifically, it evaluates construct validity by estimating both convergent and discriminate validity, while evaluating the internal consistency of the instrument itself. In addition another aim of the study is to estimate how the instrument determines the reasonable relations among the latent factors, describes the reasonable results and assigns the quality of data fit within it. The instrument has five dimensions- factors named Perceived quality (F1) Product price (F2) Trust in buying Chinese products (F3) Intention to buy Chinese products (F4) Loyalty (F5).

## **3. RESEARCH GOALS**

The present study is the ascertainment of the questionnaires validity which was designed to measure factors that have an impact on loyalty toward Chinese products as well as the investigation of relationship between the structures constuctures of the model.

For this reason and more specifically for the examination of the importance of each possible and feasible relationship that can be investigated at this model the following 7 hypotheses are examined:

- H1. Perceived quality (F1) has a positive direct effect on Trust in buying Chinese products (F3)
- H2. Perceived quality (F1) has a positive direct effect on Loyalty (F5).
- H3. Product price (F2) has a positive direct effect on Loyalty (F5).
- H4. Product price (F2) has a positive direct effect on Intention to buy Chinese products (F4).
- H5. Trust in buying Chinese products (F3) has a positive direct effect on Intention to buy Chinese products (F4).
- H6. Trust in buying Chinese products (F3) has a positive direct effect on Loyalty (F5).
- H7. Intention to buy Chinese products (F4) has a positive direct effect on Loyalty (F5).

## **4. RESEACH SAMPLE**

The sample consists of 43 Chinese tradesmen, storeowners from Thessaloniki in Greece.

## **5. METHODOLOGY**

A. *Principal Components analysis*: This paper attempts to measure Chinese tradesmen attitudes for Greek students cosumption behavior towards Chinese products toward e-Book. Principal components analysis with Varimax Rotation produces the dimension of these attitudes. The calculations of Principal components analysis were based on variance- covariance matrix because the research variances took prices from the same measurement scale, and more specifically Likert seven-rank scale. The method that was chosen as a choice of missing variables treatment was the method listwise, which excludes from the analysis any case which will reveal a cell, on one or more variables, of the same observed unit, without value, i.e. without information. To define if the sub-scales were suitable for factor analysis, two statistical tests were used. The first is the Bartlet Test of Sphericity, in which it is examined if the subscales of the scale are inter-independent, and the latter is the criterion KMO (Kaiser-Meyer Olkin Measure

of Sampling Adequacy, KMO) (Kaiser, 1974), which examines sample sufficiency. The main method of extracting factors is the analysis on main components with right-angled rotation of varimax type (Right-angled Rotation of Maximum Fluctuation), so that the variance between variable loads be maximized, on a specific factor, having as a final result little loads become less and big loads become bigger, and finally, those with in between values are minimized (Hair, 2005).

This means that the factors (components) that were extracted are linearly irrelevant. The criterion of eigenvalue or characteristic root (Eigenvalue)  $\geq 1$  was used for defining the number of the factors that were kept (Kaiser, 1960, Sharma, 1996, Hair et al., 1995). Essentially, the eigenvalue is the sum of the squares of variable loads on each factor. Actually, it is a measurement of fluctuation quantity that is relevant to the factor. Model acceptance was based on two criteria: a) each variable, in order to be included in the variable cluster of a factor, must load to it more than 0.50 and b) less than 0.40 to the rest of the factors) (Schene, et al., 1998). Moreover, each factor must have more than two variables. In addition, it was considered, on the basis of common variable Communalities ( $h^2$ ), that the variables with high Communality ( $h^2$ ) imply great contribution to the factorial model (Dafermos, 2009). The evaluation of questionnaire reliability- internal consistency is possible by Cronbach's index alpha ( $\alpha$ ) (Cronbach, 1984), which is considered the most important reliability index and is based on the number of the variables/items of the questionnaire, as well as on the correlations between the variables (Nunnally, 1978).

*B. Confirmatory Factor Analysis and Latent Class Analysis:* In order to investigate the structure of the factors measured with the questionnaire a confirmatory factor analysis (CFA) was models of structural equations and the development of a model indicating the relationship between the various factors was attempted and in particular the relationship between the observed variable and the factors. The aim of this confirmatory analysis was to reveal if the questionnaire is actually valid and suitable for the measurement of the variables it investigates. It is noted that an instrument of evaluation has valid if the existence of variation is justified in its statements (Anastasiadou et al., 2006). In order to test the model the goodness-of-fit of the research model is estimated.

It is noted that the criteria of acceptance of a model is the comparative fit index (CFI) which is not dependent on the size of the sample and taken values from 0 – 1 (Bentler, 1993, Joreskog et al., 1996) and it must, by agreement, be  $CFI \geq 0.9$ , the index  $X^2/df$  ( $X^2/df$ =chi-square to its degrees of freedom ratio) and it must be  $X^2/df < 2$ . Since the ratio  $X^2/df$  depends on the size of the sample the ratio NNFI (Non-Normed Fit Index) is used, which is independent on the size of the sample (Bentler, 1993) and it must (by agreement) be  $NNFI > 0.95$ . GFI (Goodness of Fit) is used and it must be  $GFI > 0.80$ , AGFI (Comparative Fit Index) is used and it must be  $AGFI > 0.8$  and NFI (Normed Fit Index) is used and it must be  $NFI > 0.9$  In addition, the indexes RMSR (Root Mean Square Residuals) are used and it must (by agreement) be  $RMSR < 0.06$  and the RMSEA (RMSEA=root mean-square error of approximation) and it must be  $RMSEA < 0.06$ .

For the purposes of the data analysis adaptation to the regular distributions of all the variables that participated in the analysis (Multivariate Normality) was checked and it was shown that all the univariate distributions are normal distributions, all the joint distributions of all combinations of variables are also normal and all the bi-variable scatter plots are linear and homoskedastik and finally there were no outliers. Moreover the data were evaluated for their linearity and the examination of variance charts for each variable was shown that there was not any problem of linearity.

## 6. RESEARCH TOOL

As a research tool a questionnaire measuring Chinese tradesmen attitudes for Greek people consumption behavior towards Chinese products (CTAGSCBCs) was used that it was created on the basis of five subscales as follows: Perceived quality (F1), Product price (F2), Trust in buying Chinese products (F3), Intention to buy Chinese products (F4), Loyalty (F5) which were confirmed after the application of Principal component analysis to the research data. Especially, Chinese tradesmen attitudes for Greek people consumption behavior towards Chinese products scale (CTAGSCBCs) consisted of 25 items referring to five different attitude subscales, as follows: (a) Perceived quality- positive and negative emotions concerning the quality of Chinese products (Pq1, Pq2, Pq3, Pq4, Pq5); (b) Product price- positive and negative attitudes the price of Chinese products (Pr1, Pr2, Pr3, Pr4, Pr5); (c) Trust in buying Chinese -positive and negative attitudes concerning a student's trust to buy Chinese products (Tr1, Tr2, Tr3, Tr4, Tr5); (d) Intention to buy -positive and negative attitudes concerning a student's intention to buy Chinese products (In1, In2, In3, In4, In5) and finally (e) Loyalty in Chinese products- positive and negative attitudes decides their loyalty to Chinese market (Lo1, Lo2, Lo3, Lo4, Lo5).

Each item of the instrument used a 5-point Likert scale that ranged from 1- Strongly Disagree to 5-Strongly Agree. The value of the Cronbach's  $\alpha$  coefficient for this instrument in this study's sample was 0.8713.

## 7. RESULTS

*A. Results of Principal components analysis application:* The estimates of the application of Principal component analysis was based on covariance matrix due to the fact the research variances took values from the same measurement scale, and more specifically Likert five-rank scale. The 25 items were items of a five Likert scale. The indicator of the sample adequacy  $KMO=0.856>0.60$  indicated that the sample data are suitable for the undergoing of factor analysis. Bartlett Test of Sphericity, in which it is examined if the subscales of the scale are inter-independent (Bartlett's  $sign<0.01$ ) proved that the principal component analysis has a sense. Through this analysis, data grouping was based on the inter-correlation of items; with the aim of imprinting identifying those factors which best describe completely and with clarity the participants' attitudes.

Based on analysis resulted five uncorrelated factors explained 72.348% of the total inertia of the data and are described separately afterwards. The index of internal consistency Cronbach's  $\alpha$  is statistically significant and equal to 87,13% for the total number of the questionnaire items and therefore the scale of 25 items was considered as reliable with the meaning of internal consistency.

The reliability coefficient (Cronbach's  $\alpha$ ) is statistically significant and equal to 89.04%, 87.35%, 81.86%, 79.18% και 80.24% for the 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>, and 5<sup>th</sup> factorial axis respectively. Finally, from the values of common factor variance (Communality) for each item we realise that most of them have value more than 0.50 fact that declare satisfactory quality of measurement from the sample model, model of 5 factors- components.

The results of the present research confirm the presence of five components- constructs named: Perceived quality (F1), Product price (F2), Trust in buying Chinese products (F3), Intention to buy Chinese products (F4), and Loyalty (F5).

*Reliability:* Reliability refers to what extent an instrument gives constant results from the measurements and every deviation, which is presented between two different measurements, is due to measurement's error (Nunnally, 1978).

The evaluation of a model (includes) counts in the reliability assessment, which measures the internal consistency of factors. Internal consistency can be calculated with the use of the Cronbach's  $\alpha$  coefficient (Cronbach, 1984) with acceptable values over 0.7 and with the composite reliability of Formell and Larcker (1981), which is a measure of internal consistency of the structure indexes. These represent the level of the latent structure and they are based on the correlations between the variables that compose the factor.

Values of the Cronbach's  $\alpha$  coefficient over 0.7 is considered as satisfactory (Spector, 1992; Nunnally, 1978). The composite reliability should be over 0.7 in order to be satisfactory (Formell & Larcker, 1981). The extracted variance is another measure of reliability that represents the total amount of structure's variance which is due to the variance of the determining variables.

Table 1 presents the results of reliability test. Table 1 shows that the reliability of each construct is above 0.79, fact that implies that the internal consistency of the constructs is high. Moreover Composite Reliability (CR: Composite Reliability) was also estimated. As shown in Table 1 Composite Reliabilities are above the threshold of 0.79. In conclusion, the measures in this study are reliable and valid and indicate a good fit model.

**Table 1: Reliability and Validity**

Factors	Number of items	Loadings	Cronbach's $\alpha$	Eigenvalue	Ερμηνευόμενη διασπορά	Composite Reliability (CR)	AVE
Perceived quality	5	0,728-0,869	0,8904	14,743	0,768	0,8905	0,737
Product price	5	0,634-0,815	0,8735	13,946	0,749	0,8737	0,725
Trust in buying	5	0,612-0,793	0,8186	8,554	0,771	0,8189	0,739
Intention to buy	5	0,625-0,762	0,7918	5,607	0,813	0,7919	0,782
Loyalty	5	0,557-0,741	0,8024	4,114	0,811	0,8024	0,796

*Validity:* The term validity refers to how well the instrument (questionnaire) measures what is intended to measure (Cohen et al., 1988). Convergent and discriminant validity are both considered subcategories and subtypes of construct validity.

*Test of convergent validity:* The convergent validity is related to the level at which many different methods of variable measurements lead to the same results (Spector, 1992).

Wixom & Watson (2001) state that the *convergent validity* is acceptable when the loadings of all the variables are over 0.50 while Kim (2008) supports that the items of all the structures should load on one factor with eigenvalue over 1 (eigenvalue >1) in order the *convergent validity* be acceptable. Chin (1998) suggests that the *convergent validity* should be controlled by the evaluation of the Composite reliability with the cutoff of .7 and the variance extracted with the cutoff of 0.5 (Fornell & Larcker, 1981).

*Test of discriminant validity:* The *discriminant validity* refers to the hypothesis that dissimilar structures should be different (Burns & Bush, 1995). Bagozzi (1990) describes this as the level where the factors of a scale evaluate different issues. The evaluation of the *discriminant validity* takes place under the examination of the correlations of the latent factors through the Confirmatory Factor Analysis, (CFA), that has the advantage that the examining factors is free from the measurement's error.

The *discriminant validity* can be checked with the examination of the correlations between factors that should be lesser than the root of the mean extracted variance (Kim et al., 2008). An indication of the *discriminant validity* exists when the coefficient of the correlation between the factors is lesser than the Cronbach's a coefficient of each factor (Churchill, 1979). The *discriminant validity* can be also checked by examining whether the correlations between the variables are lesser than the the root of the mean variance extracted (Kim et al., 2008).

Fornell & Lacker (1981) propose the *discriminant validity* to be evaluated with the examination of the correlation between the variables. Indeed, *discriminant validity* exists when one variable is correlated to the rest variables of the same structure (construct) at a higher extent than to any other variable of a different structure (construct) (Chin, 1998).

Average Variance Extracted (AVE) was estimated in order convergent validity to be confirmed because AVE can also evaluate convergent validity. In table 1 AVE is adove 0,725, that meachs that convergent validity of the instrument was satisfied.

*Scree plot graph:* The scree test produces (Figure 1) the following graph, which shows a representation of eigenvalues, leads us to determine the number of the vital factorial axes.

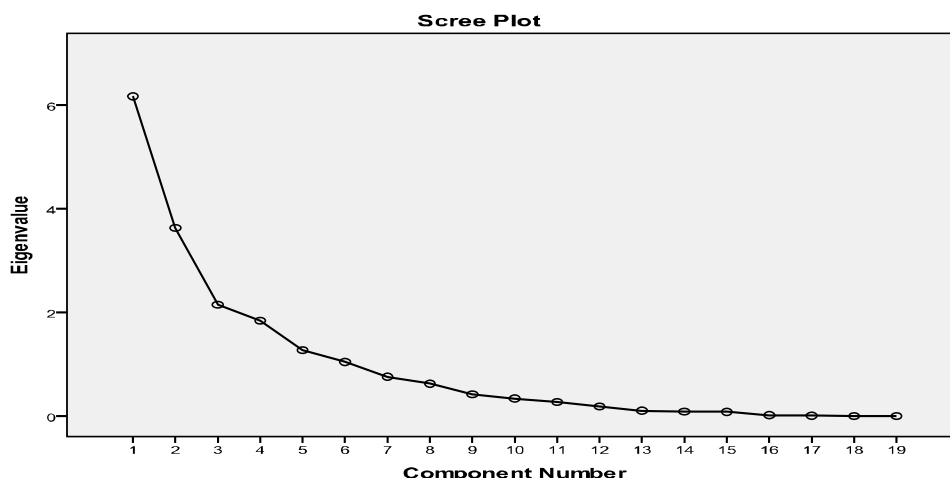


Figure 1: Scree Plot

The above graph (Graph 2) shows a distinct break up to the fourth factor, whereas, after the fourth one, it follows a linear part of the eigenvalue curve. So, taking under consideration eigenvalues, which are higher than 1 for the five factors (14.743, 13.946, 8.554, 5.607 and 4.114 for the 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> correspondingly) and decide whether they interpret data in a satisfactory way and thus Convergent Validity exists.

In addition, the values of eigenvalues, which are higher than 1 for the five factors implies Convergent Validity of the instrument (Spector, 1992, Churchill, 1979) which refers to the extent to which items under each construct, are actually measuring the same construct.

In addition the average extracted variances are all above the recommeded 0.5 level (Hair et al. 1998), that implies convergent validity (Table 1).

Compared to Cronbach's alpha equal to 89.04%, 87.35%, 81.86%, 79.18% και 80.24% for the 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> factorial axis respectively, which assumes equal loadings of all the items of a construct and it is influenced by the numbers of items, Composite Reliability relies on actual loadings toncompute the factors scores and thus provides a better indicator for measuring internal consistency. As shown in Table 1 Composite Reliabilities are for all the constructes above the threshold of 0.7.

Table 2 provide the descriptive statistical elements and the constructs collerations. Moreover, items loadings on the constructs were above the cutoff point of 0.50 (Table 1), fact that conforms the questionnaire quality and its validity.

**Table 2: Convergent Validity Analysis (SEM correlations<sup>a</sup>)**

	F1	F2	F3	F4	F5
<b>Factors</b>					
<b>Perceived quality (F1)</b>	0,737				
<b>Product price (F2)</b>	0,956	0,725			
<b>Trust in buying Chinese products (F3)</b>	0,823	0,815	0,739		
<b>Intention to buy Chinese products (F4)</b>	0,802	0,811	0,819	0,782	
<b>Loyalty (F5)</b>	0,898	0,824	0,836	0,812	0,796

Note: <sup>a</sup>: All the correlations are statistically significant at the level of  $\sigma p < 0,05$  <sup>b</sup>: The elements in the main diagonal are AVE's value.

In addition, the good fit indices were estimated, that they showed that the estimated model has a very good fit to data after their analysis with the aim of Confirmatory factor Analysis and the results are presented in table 3.

**Table 3: Good Fit Indices**

Good Fit Indices	THRESHOLD	Perceived quality	Product price (F2)	Trust	Intention to buy	Loyalty
<b>RMSEA</b>	< = 0,05	0,05	0,05	0,05	0,05	0,05
<b>CFI</b>	> = 0,90	0,91	0,94	0,95	0,94	0,95
<b>GFI</b>	> = 0,90	0,92	0,93	0,92	0,91	0,93
<b>AGFI</b>	> = 0,80	0,86	0,85	0,82	0,82	0,81
<b>RMR</b>	< = 0,05	0,02	0,04	0,03	0,02	0,02
<b>SRMR</b>	< = 0,08	0,05	0,05	0,04	0,05	0,04

*Model Confirmation and Hypotheses testing:* The hypotheses are tested through structural equation modelling technique (SEM) by LISREL 8.5, software. Model estimation was done using the Maximum Likelihood Estimation, with the item covariance matrix used as input. The results are presented in Table 4. In summary, the various measures of the overall model goodness-

of-fit lend sufficient support to deeming the results an acceptable representation of the hypothesized constructs (Table 4). In addition, the overall model goodness-of-fit results and the measurements model assessments lend substantial support for confirmation of the proposed 5-factor model (Hair, 2005) (Table 3).

In relation to factors paths, presented in Table 4, it results that factors F1 (perceived Quality) and F2 (Product Price) have a significant direct effect on F5 (Loyalty) and factor F4 (Intention to buy) has a quite significant direct effect on F2 (Product price) and F5 (Loyalty). In addition, factor F3 (Trust in buying) has a relative significant direct effect on F4 (Intention to buy). Furthermore, the effect of F4 (Intention to buy) on F5 (Loyalty) is significant, too.

**Table 4: Theoretical Estimation of Model**

	<b>Theoretical Estimation of</b>	<b>Mondel t-value</b>
<b>H1: F1 -&gt;F3</b>	<b>0,78</b>	<b>5,78*</b>
<b>H2: F1 -&gt;F5</b>	<b>0,81</b>	<b>6,13*</b>
<b>H3: F2 -&gt;F5</b>	<b>0,79</b>	<b>6,09*</b>
<b>H4: F3 -&gt;F4</b>	<b>0,25</b>	<b>3,13*</b>
<b>H5: F3 -&gt;F4</b>	<b>0,63</b>	<b>4,29*</b>
<b>H6: F3-&gt;F5</b>	<b>0,49</b>	<b>4,13*</b>
<b>H7: F4 -&gt;F5</b>	<b>0,61</b>	<b>5,76*</b>
<b>Fit statistics</b>	<b>The model has an</b>	<b>Excellent Fit</b>

*Note: Perceived quality (F1), Product price (F2), Trust in buying Chinese products (F3), Intention to buy Chinese products (F4), Loyalty (F5); \*p<0,05.*

## 8. CONCLUSIONS/ DISCUSSION

The main aim of this study is to examine the validity and reliability of an instrument (a structural equation model). The propoed research tool questionnaire entailed five subscales as follows: Perceived quality (F1), Product price (F2), Trust in buying Chinese products (F3), Intention to buy Chinese products (F4), Loyalty (F5).

The results satisfied Discriminant Validity, Convergent Validity and Composite Reliability. In addition the overall model goodness-of-fit results and the measurements model assessments lend substantial support for confirmation of the proposed 5-factor model.

Results showed that Perceived Quality and Product Price have a significant influence on Loyalty in buying Chinese Products. Further more Intention to buy is related to Product price. In addition, it is the Intention to buy that influences Loyalty.

This instrument can be useful to any company, Chinese or not, or organization that wants to find whether the mentioned factors leads to consumption of the specific products. For this reason, as a starting point it is useful for any company or organization to recognize whether their customers are pay attention and be influenced by Perceived quality, Product price, Trust in buying and lead them to buy and stay Loyal to their product and brand. At the same time, it has to find out what is the orientation towards customer loyalty and the emotional identity and



behavior of every group of customers in order to be ready for any future investment with the aim of achieving further development.

## 9. IMPLICATIONS FOR FURTHER STUDY

In addition to this study a follow-up research in which in-depth interviews will be conducted to explore Chinese traders' views about their Greek customers' habits and behaviours, positive or negative should complement the present's findings. A qualitative research can complement and enrich this quantitative research study and the same research may take place with other different samples as the comparison of those seems to have huge interest and create new discussions and implications. Furthermore another crucial factor named Greek consumer ethnocentrism should be evaluated toward customer loyalty.

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