Relationship between Trust and E-Commerce Adoption-A Study of Potential Moderators

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In developing countries like Thailand or most of the ASEAN member countries, e-commerce is still developing as a new marketing channel for shopping. Therefore knowing more about the factors influencing the adoption of this virtual shopping channel among Asian online consumers is interesting. Previous studies revealed that lack of trust is the major factor affecting the low growth rate of e-commerce trade in Asian regions. Though we have adequate studies showing the positive relationship between trust and online adoption, very few talks about the factors moderating this relationship. The purpose of this paper is to analyse the potential variables which may affect, modify or change the relationship between online trust and user's intention to shop online. The study investigate the effects of three observable variables such as gender, income and previous computer experience on trust and online shopping intention. The data for this study is collected from 400 business management students of a leading university in Thailand. The results show that gender and age are not significant in influencing the relationship between trust and intention to use e-commerce. However, prior computer and online experience is found to be a significant moderator. Trust is found to be strongly influencing the intention to use e-commerce among the respondents with less internet experience compared to those with more than 4 years of online shopping experience.

Track: Marketing

1. Introduction

Recent times have witnessed a technological revolution accelerated by the widespread use of the internet, web technologies, and their applications. Electronic commerce or e-commerce as part of this information technology revolution became widely used in world trade. E-commerce is defined as covering the distribution, sales, or delivery of goods and services by electronic means (Al-fadhli 2011). Kalakota & Whinston (1997) defined e-commerce as any form of business conducted via electronic means which might range from product and services information to selling and/or buying product/services. E-commerce is also considered to be commercial activities that take place by digital processes over a network. The simple form of definition for e-commerce is any transaction that takes place via the internet. Business-to-consumer e-commerce (B2C), which is the focus of this study, refers to activities in which consumers by products or services using the internet as the medium for transactions.

Web based retailing has become a global phenomenon with steady increases in online sales across the globe. In the United States e-commerce sales totalled USD227 billion in 2012 an increase of 14.7 percent from USD198 billion in 2011 (US Department of Commerce 2014). However in Thailand, The National Statistics Office in Thailand has reported that the total e-commerce market in Thailand in 2013 was only worth about USD 12.78 billion excluding the government procurements. Of this, about USD 8.8 billion or 69 per cent came from business-to-business (B2B) transactions, USD 3.7 billion or 29 per cent came from business-to-consumer (B2C) transactions and the remaining came from business-to-government (B2G) transactions (Office 2014).

According to the recent internet statistics, Asia accounted for 45.3% of the internet users in the world (Stats 2014). However wide majority of these users are reluctant to shop online due to various reasons. Several factors such as fear of fraud, security concerns, lack of trust, and the intangible nature of many online products have dissuaded consumers from purchasing online (Gefen et al. 2003;
Ranganathan & Jha 2007). Chen & Barnes, (2007) pointed that lack of trust is discouraging the online users from participating in e-commerce platforms. Studying about the role of online trust in e-commerce is therefore very important especially in Asian context. We have plenty of literatures talking about the positive influence of trust in e-commerce adoption (Roca et al. 2009; Mayer et al. 2012; Lee & Turban 2001; Yousafzai et al. 2009; Gefen et al. 2003). However very rarely we can see a paper studying about the moderating forces that affect this positive relationship. This paper aimed to fill this gap by contributing a literature analysing the moderation effects of various factors that might significantly influence the relationship between trust and online shopping behaviour.

Rest of this paper is arranged as follows. Review of literature related to e-commerce, online trust and its main components were discussed in the next section. Research methodology and conceptual framework were presented in the subsequent sections. Results of the data analysis was presented next. Lastly conclusion and implications of the findings are presented.

2. Literature Review

2.1 E-commerce

Recent developments in the field of communication technologies especially those involving the internet have increased the role of e-commerce in business management. E-commerce may be described as a very broad concept and generally e-commerce is viewed as a subset of e-business activities which range from simple e-mails to e-enabled supply chain management (Brown 2008). Kalakota & Whinston, (1997) defined E-Commerce as any form of business conducted via electronic means which might range from product and services information to selling and/ or buying product/services. Business to consumer e-commerce (B2C) is the focus of this paper and is defined as the activity in which consumers buy products or services using the Internet as the medium of transactions. For marketers, e-commerce opens up a new channel through which to enact products and services purchase and delivery in addition to the brick and mortar market places. E-commerce provides many forms of benefits to marketers as well as customers. Lin (2003) pointed out the following major advantages to suppliers are provided by successful integration of e-commerce technologies: 24 hours, 365 days opening; lower costs; efficiency gains; extended market research; quick adjustments to market conditions; influence customer purchases; and improved customer services. According to Kotler (2010) e-commerce provides the following advantages to the customers: convenience; faster information gathering; fewer hassles; low procurement costs; private shopping; and instant transactions.

2.2 Trust

Trust may be defined in a broad sense as the confidence a person has in his or her favourable expectations of what other people will do based, in many cases, on previous interactions (Gefen, 2000). The relative importance of trust therefore depends on the nature and the complexity of interaction with other people. Trust is therefore by its nature complex, multi-dimensional (Ganesan, 1994; Gefen, 2000) and context dependent (Gefen, 2000; Roussseau, et al., 1998). Since in a virtual environment, the degree of uncertainty of a transaction is higher than the traditional settings, trust becomes an important factor. Trust has always been an element in influencing consumer behavior toward merchants (Chellappa & Pavlou 2002). Consumers trust in their online vendors is vital for the sustained progress and development of e-commerce. Lack of proper trust of online businesses is one of the reasons for customers not being engaged in e-commerce transactions (Chellappa & Pavlou,
Therefore, in the e-Commerce field, researchers have shown an increasing awareness of how trust contributes towards the success of various business models in online environments (Chellappa & Pavlou, 2002; Connolly & Bannister, 2008; Eid, 2011; Gefen et al., 2003; Keen et al., 2000). Connolly & Bannister (2008) indicate a number of factors that have a strong influence on online consumers trust. The characteristics of the online vendor, situational factors, third party certification, the individual’s propensity to trust, and the influence of perceived risk on the consumer’s trust response are examples. McKnight et al. (2002) suggest three important factors related to the development of trust between online companies and consumers (safety of the trading online environment, the company’s goodwill, and the quality of the website). Consumers trust in their online transactions is very important for the sustained growth and development of e-commerce. Despite the huge popularity of the Internet, lack of trust is considered to be the main reason why people do not use the Internet for their shopping needs. Among the factors that inhibit the future growth of e-commerce are customer concerns about their privacy of information and a lack of trust in e-commerce vendors (Chen, 2010). Gefen et al. (2003) studied the role of trust in online shopping and found that trust is the most important reason why customers return to the same e-vendor for their shopping.

Yousafzai et al. (2009) studied the multi-dimensional role of trust in internet banking adoption and found that trust is a key element of e-commerce success because trust is crucial wherever uncertainty and interdependence exist. In his studies, researcher identified the key components of online trustworthiness which are competence, benevolence and integrity. Competence is defined as the group of skills, competencies, and characteristics that enable a party to have influence within some specific domain. Benevolence is defined as the extent to which a trustee is believed to want to do good to the trusting party aside from a profit motive and benevolence suggests that the trustee has some specific attachment to the trustor (Mayer et al. 2011). Another important study related to the role of trust and e-commerce is by McKnight et al. (2002) who developed and validated measures of trust in the context of e-commerce. McKnight et al. (2002) were mainly studying about the trusting beliefs who defined trusting as the trustor’s perception that a specific web based vendor has attributes that are beneficial to the trustor. There are three important characteristics of trusting beliefs: competence (the ability of the trustee to do what the trustor wants); benevolence (the trustee’s care and motivation to act in the trustor’s interests); and integrity (the trustee’s honesty and promise keeping). These constructs are consistent with those of Mayer et al. (1995).

Based on the above, researcher includes three components perceived competence, perceived benevolence and perceived integrity as part of the variable online trust.

### 2.3 Behavioral Intention

Behavioral Intention was introduced in the TPB and is defined as an individual's subjective probability that he or she will do a specific behavior. Ajzen (1991) described behavioral intention as the central factor of the TPB and suggested that intentions are assumed to capture the motivational factors that influence a behavior and they are indications of how hard people are willing to try, or how much effort they are planning to exert, in order to perform the behavior. Therefore the stronger the intention to perform behavior, the more likely should be its performance. Wang (2008) defined intention to use online shopping sites as the favorable attitude of a customer towards an e-commerce system that results in repeat use/purchase behavior*

Behavioral intention to use internet websites can be considered as a post acceptance behavior which involves repeat purchasing of a product or service in the future (Brown 2008; Yen 2010). In a study of Internet banking acceptance Yen (2010) suggested that the Internet based market primarily depends on the user’s behavioral intention to continue using Internet banking services rather than first time use. DeLone & McLean, (2003) suggested that intention to use a system can be considered as
an alternative measure of system success considering the multi-dimensional aspects of actual system use. Many previous literatures studying e-commerce adoption (Brown, 2008; John, 2012; Wang, 2008; Yen, 2010) have adopted Behavioral Intention to shop online as a reliable measure of actual usage of online shopping websites. Based on the above, in this study, e-commerce adoption is measured in terms of Behavioral Intention to use online shopping websites.

3. The Research hypothesis and methodology.

Based on the literature reviewed and discussed above, a conceptual model (Figure 1) is developed to test the interaction effect of three variables such as gender, income and prior computer experience on the relationship between trust and behavioural intention is developed.

![Figure 1: Conceptual Model](image)

Following are the research hypotheses tested in this study:

**H1:** Gender of the online users moderates the relationship between trust and e-commerce adoption intention.

**H2:** Income of the online users moderates the relationship between trust and e-commerce adoption intention.

**H3:** Previous computer experience of the online users moderates the relationship between trust and e-commerce adoption intention.

This research paper is based on a quantitative study using survey as the method of data collection. The study initially tests the reliability and validity of the measurement variables and then the interaction effects of gender, income and prior computer experience were analysed. Convenience sampling techniques were employed and data were collected from 400 business management students of a leading private university in Thailand. Students were selected since they represent an important target segment for many consumer products and brands and also because of the convenience of finding respondents.
All the measurement items were taken from previous empirically validated publications in order to ensure the content validity and used 5 point Likert scale.

Trust was measured as a multi-dimensional construct with 3 dimensions such as Perceived benevolence (4 items), Perceived Integrity (4 items) and Perceived competence (4 items). The four items for perceived integrity is taken from Lee & Turban, (2001) and Mcknight & Chervany, (2002). The four items of perceived benevolence and four items of perceived competence were adapted from Mayer et al., (2011) and Mcknight & Chervany, (2002). Behavioural intention is measured by three items which were adapted from (Venkatesh et al. 2012; Venkatesh & Zhang 2010).

4. The Results of data analysis

Reliability of all the items were calculated and the results were quite satisfactory (Table 1). The Cronbach’s Alpha values were ranging from 0.943 to 0.960 indicate high overall internal consistency among the items under each of the construct.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Items</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Integrity</td>
<td>4</td>
<td>0.960</td>
</tr>
<tr>
<td>Perceived Benevolence</td>
<td>4</td>
<td>0.949</td>
</tr>
<tr>
<td>Perceived competence</td>
<td>4</td>
<td>0.951</td>
</tr>
<tr>
<td>Behavioral Intention</td>
<td>3</td>
<td>0.943</td>
</tr>
</tbody>
</table>

A measurement model is developed to verify that 15 measurement items reflect the four unobserved variables in a reliable manner. The overall fit of the measurement model (Refer Figure 2), adequacy of the factor loadings, explained variances of the measurement model were determined by the Confirmatory factor analysis (CFA) using AMOS version 18. The results of the CFA (refer Table 2) showed the measurement model a good fit to the data collected. The standardized loading estimates for all the variables range from 0.88 to 0.95 (Hair et al., 2010) suggesting adequate convergent validity. These values indicate that all the 15 measurement variables are significantly represented by their respective latent constructs.
4.1 Results of moderation Analysis.

A third variable is called a moderator when the relationship between two variables is depending on the third variable. In moderation analysis, we are calculating the interaction effect of independent variable and the moderating variable. This research paper investigate the moderating effects of three variables; gender, income and previous computer experience on the relationship between trust and intention to adopt e-commerce.

Multi-group path analysis was performed using AMOS 18 to test the 3 moderation effects mentioned above. For the test 1, grouping variable was gender and the model tested includes Trust as a first order factor model and behavioural intention. If the models tested for both males and females differ significantly in terms of estimates, then the moderation by gender is present. To check the significant
differences among groups, the pairwise comparison critical ratio test is carried out among the path coefficients. Figure 3 and Figure 4 shows the models tested for both male and female using AMOS 18. The critical ratio for differences test among gender (Table 3) shows that none of the pairwise comparisons between path coefficients for male and females is significant ($z<1.96$, $p>0.05$). Therefore we can conclude that there is no difference between male and female with regard to their relationship between trust and e-commerce adoption. Therefore the hypothesis that gender influence the positive relationship between trust and intention is not accepted.

**Figure 3: Tested Model for Men**

![Tested Model for Men](image1)

**Figure 4: Tested Model for Female**

![Tested Model for Female](image2)
Table 3: Pairwise comparison of path coefficients for Gender

<table>
<thead>
<tr>
<th>Critical ratios for differences between parameters (Variant model)</th>
<th>mv1</th>
<th>mv2</th>
<th>mv3</th>
<th>mv4</th>
<th>m1</th>
</tr>
</thead>
<tbody>
<tr>
<td>fv2</td>
<td>-0.324</td>
<td>0.109</td>
<td>-0.945</td>
<td>-1.103</td>
<td>-2.238</td>
</tr>
<tr>
<td>fv3</td>
<td>1.203</td>
<td>1.775</td>
<td>1.293</td>
<td>1.024</td>
<td>-1.31</td>
</tr>
<tr>
<td>fv4</td>
<td>1.617</td>
<td>2.193</td>
<td>1.982</td>
<td>1.714</td>
<td>-0.97</td>
</tr>
<tr>
<td>f1</td>
<td>1.055</td>
<td>1.47</td>
<td>0.897</td>
<td>0.755</td>
<td>-0.95</td>
</tr>
</tbody>
</table>

Income of the respondents were measured on 8 levels. However 2 categories of income groups that were strongly present, such as Income less than 15,000 Thai Baht per month and Income between 15,000-25,000 THB per month were selected to check the moderation effect.

Figure 5: Path model with less than 15,000 monthly income

Figure 6: Respondents with 15,000-25,000 monthly income
Table 4: Pairwise comparison of path coefficients for Income

<table>
<thead>
<tr>
<th></th>
<th>Li1</th>
<th>Li2</th>
<th>Li3</th>
<th>Li4</th>
<th>L1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi1</td>
<td>-0.965</td>
<td>-1.263</td>
<td>-1.989</td>
<td>-1.475</td>
<td>-3.002</td>
</tr>
<tr>
<td>Hi2</td>
<td>-0.296</td>
<td>-0.608</td>
<td>-0.836</td>
<td>-0.385</td>
<td>-2.486</td>
</tr>
<tr>
<td>Hi3</td>
<td>0.062</td>
<td>-0.294</td>
<td>-0.368</td>
<td>0.251</td>
<td>-2.355</td>
</tr>
<tr>
<td>Hi4</td>
<td>0.045</td>
<td>-0.31</td>
<td>-0.404</td>
<td>0.217</td>
<td>-2.366</td>
</tr>
<tr>
<td>H1</td>
<td>1.335</td>
<td>1.009</td>
<td>1.715</td>
<td>2.011</td>
<td>-1.115</td>
</tr>
</tbody>
</table>

Table 4 shows that the difference in the path coefficients seen in Figure 5 and Figure 6 are not significant. Therefore we can conclude that income is not an effective moderator for the relationship between trust and e-commerce adoption. Therefore the hypothesis that income influence the positive relationship between trust and intention is not accepted.

The same method applied for the prior online experience. Two groups with more number of respondents were tested. Based on the results shown in Figure 7, Figure 8 and Table 5, we can see that respondents with less than 2 years’ experience perceive the relationship between trust and intention to adopt e-commerce stronger than the respondents with online experience for more than 4 years but less than 6 years.

**Figure 7:** Respondents with less than 2 years online experience
Table 5: Pairwise comparison of path coefficients for Prior Experience

<table>
<thead>
<tr>
<th></th>
<th>exp1</th>
<th>exp2</th>
<th>exp3</th>
<th>exp4</th>
<th>e1</th>
</tr>
</thead>
<tbody>
<tr>
<td>exp11</td>
<td>-1.281</td>
<td>-1.862</td>
<td>-4.065</td>
<td>-4.318</td>
<td>-3.357</td>
</tr>
<tr>
<td>exp22</td>
<td>-0.471</td>
<td>-0.993</td>
<td>-2.701</td>
<td>-2.93</td>
<td>-2.546</td>
</tr>
<tr>
<td>exp33</td>
<td>1.265</td>
<td>0.545</td>
<td>-1.845</td>
<td>-2.229</td>
<td>-1.696</td>
</tr>
<tr>
<td>exp44</td>
<td>2.053</td>
<td>1.359</td>
<td>-0.561</td>
<td>-0.938</td>
<td>-1.031</td>
</tr>
<tr>
<td>e2</td>
<td>0.034</td>
<td>-0.464</td>
<td>-1.978</td>
<td>-2.196</td>
<td><strong>-2.047</strong></td>
</tr>
</tbody>
</table>

Critical ratios for differences between parameters (Variant model)

Figure 8: Respondents with 4-6 years of online experience

The z-test for differences between path coefficient of two different income groups yielded a value of 2.047 which is more than 1.96 (z value is significant at p=0.05). This means that there is a difference between low computer experienced people and high experienced people as far as their influence of their online trust on intention to use e-commerce sites are concerned. We can see that the path coefficient of less than 2 years experienced people is quite high compared to the second group of respondents (refer Figure 7 and Figure 8). Therefore the hypothesis that previous online experience influence the positive relationship between trust and intention is accepted.

5. Conclusion and Implications of the study

The interaction effects of three observed variables, gender, income and prior computer experience on the relationship between trust and online shopping adoption were tested in this paper. The results findings suggest that gender and income are not significant moderators of this relationship. However, the third variable prior online experience is found to be a significant moderator or interacting variable while considering the relationship between trust and intention to adopt e-commerce.

This study has both theoretical and practical implications. From a practical point of view, the results provide significant highlight to improve the e-commerce transactions among Asian consumers.
People with less experience in using computers and online shopping exhibit strong relationship between their trust and online shopping intention. This is a significant result to be noted for the online vendors who are entering into e-market place especially in Asian regions. Internet penetration rates are lower in Asia compared to other regions. Therefore vast majority of online users are less experienced in shopping online. E-marketers and online vendors have to take necessary action plans to build up the trust of these group of people in order to achieve profitability through this new marketing and selling channel.

Many online vendors consider gender as an important factor in online shopping. However the results shows that there is no difference in the intention to use e-commerce sites among males and females. Instead of providing more attractive promotions and targeting a particular gender, e-marketers should concentrate more on gaining the trust of both their online users. Providing secure payment channels, prompt customer service, easy to use websites, displaying clear and updated information in the websites etc. will increase the trust of online users.

From a theoretical point of view, this paper provides a very comprehensive understanding of analyzing the moderation effects of a relationship. Even though online trust has been studied by many e-commerce researchers, very few actually concentrated on the moderators affecting the relationship between trust and intention to adopt e-commerce. None will be available in Asian region as per the understanding of the researcher. A few literatures are available which consider the hierarchical regression methods in order to analyze the effects of latent variables as moderators in an e-commerce model. Therefore this paper contributes more to the literature of e-commerce adoption by providing a comprehensive understanding of the methods to analyze the effect of moderators using structural equation modelling techniques.

From a methodological point of view, this study welcomes future researchers to conduct similar moderation testing for other factors influencing e-commerce adoption.

This paper is also not free from any limitations. The sample considered for this study includes business management students of a leading private university in Thailand. This homogeneity of the sample might be a limitation to this study especially when aiming to test for moderation. Therefore further studies should include more representative sample from various age groups and professions. Researcher considers only three important components of trusting beliefs such as perceived integrity, perceived benevolence and perceived competence. Previous studies show that many more factors are significantly influencing trust such as perception towards security, privacy, vendor reputation etc. Future studies should be conducted to analyze the direct, indirect, and interaction effects of these variables on e-commerce adoption and use.

References


