Understanding Factors Influencing a SME to Continue Adopting the B2B Marketplace to Maintain its Presence

Jinbi YANG
Information Systems, USTC-CityU Joint Advanced Research Center, Suzhou, Jiangsu, China, yjinjin@mail.ustc.edu.cn

Liqiang Huang
Information Systems, USTC-CityU Joint Advanced Research Center, Suzhou, Jiangsu, China, hlq@mail.ustc.edu.cn

Ya-Ni Shi
Information Systems, USCT-CityU Joint Advanced Research Center, Suzhou, China., ynshi@mail.ustc.edu.cn

Nan Wang
Information Systems, USCT-CityU Joint Advanced Research Center, Suzhou, China., kewang@mail.ustc.edu.cn

Chuan-Hoo Tan
Information Systems, City University of Hong Kong, Kowloon Tong, Kowloon, Hong Kong., tancho@comp.nus.edu.sg

See next page for additional authors

Follow this and additional works at: http://aisel.aisnet.org/amcis2012

Recommended Citation
YANG, Jinbi; Huang, Liqiang; Shi, Ya-Ni; Wang, Nan; Tan, Chuan-Hoo; and Ling SIA, Choon, "Understanding Factors Influencing a SME to Continue Adopting the B2B Marketplace to Maintain its Presence" (2012). AMCIS 2012 Proceedings. 21.
http://aisel.aisnet.org/amcis2012/proceedings/AdoptionDiffusionIT/21

This material is brought to you by the Americas Conference on Information Systems (AMCIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in AMCIS 2012 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.
Author
Jinbi YANG, Liqiang Huang, Ya-Ni Shi, Nan Wang, Chuan-Hoo Tan, and Choon Ling SIA
Understanding Factors Influencing a SME to Continue Adopting the B2B Marketplace to Maintain its Presence

Jinbi Yang
University of Science and Technology of China,
City University of Hong Kong Joint Advanced Research Center, China
yjinjin@mail.ustc.edu.cn

Yani Shi
University of Science and Technology of China,
City University of Hong Kong Joint Advanced Research Center, China
ynshi@mail.ustc.edu.cn

Chuan-Hoo Tan
Department of Information Systems
City University of Hong Kong
Hong Kong, China
ch.tan@cityu.edu.hk

Liqiang Huang
University of Science and Technology of China,
City University of Hong Kong Joint Advanced Research Center, China
hlq@mail.ustc.edu.cn

Nan Wang
University of Science and Technology of China,
City University of Hong Kong Joint Advanced Research Center, China
kewang@mail.ustc.edu.cn

Choon-Ling Sia
Department of Information Systems
City University of Hong Kong
Hong Kong, China
iscl@cityu.edu.hk

ABSTRACT
The emerging online Business-to-Business (Liu, Sia and Wei) marketplace in China, with major websites such as Alibaba.com and ECVV.com, has presented a huge opportunity for Small-and-Medium Enterprises (Arend) to reach out to an extensive pool of potential corporate customers. This would not have been possible through conventional strategies such as trade fairs and road shows. Despite the availability of B2B opportunities, SMEs may not be able to benefit from participation in the B2B marketplace. Prior to making a decision on participation in the B2B marketplace, an SME needs to decide on whether to pay for its presence on the website of a B2B marketplace operator. Building on the real option theory, this study seeks to examine such a decisional situation by proposing and validating a set of factors, which could potentially influence the decision of an SME to continue (Adner and Levinthal) its position in the B2B marketplace. Results from a survey involving 74 SMEs reveal that the perceived flexibility in such investments significantly affects the perceived real option value, which in turn affects the inclination of an SME to continue its presence in the B2B marketplace.

Keywords
Continuing adoption, Cognitive-Affective, Real option theory, Anxiety, Uncertainty, Flexibility

INTRODUCTION
Established online Business-to-Business (Thatcher, Foster and Zhu 2006) marketplace website operators such as Alibaba.com and Globalsources, provide an unprecedented opportunity for firms, particularly the Small and Medium Enterprises (Payne 2002), to reach out to an extensive pool of potential corporate customers. On such marketplaces, SMEs are able to advertise their corporate information not only to local buyers but also to overseas purchasers (Yu 2007). According to a recent report by Gartner¹, in 2010, the global sum of online transactions conducted in B2B marketplaces was USD 7-trillion, a considerable

increase, from USD 0.452 trillion in 2003. Despite the much publicized business opportunities available for “going online”, not every SME is able to realize such benefits; and hence many SMEs are faced with the dilemma of whether to continue its payments to the B2B marketplace operator to maintain a presence in the marketplace.

Our review of the related literature suggests that the bulk of extant studies have narrowly focused on the decision to accept the online opportunity, i.e., intention to adopt the online marketplace (White, Daniel, Ward and Wilson 2007). For instance, Grewal et al. (2001) identified that organizational motivation in terms of efficiency and legitimacy, and the organizational learning and information technology capabilities, significantly influence a firm’s propensity to adopt the online marketplace. Similarly, Tan et al. (2007) found that restricted access to computers, lack of internal trust, lack of enterprise-wide information sharing, intolerance towards failure, and the incapability to deal with rapid change greatly inhibit the inclination of an SME to adopt the B2B marketplace. In the Grandon and Pearson study (2004), the authors observed that external pressure, perceived ease of use, and perceived usefulness, significantly affect a SME’s decision to adopt. While these studies enrich our understanding of the initial adoption of the B2B marketplace, the question of what inhibits a SME from continuing to remain in the B2B marketplace is not addressed.

Addressing this “unanswered” question is important for four reasons. First, examining the continuing adoption itself is an interesting problem, which has inspired a significant number of researchers for over a decade. Studies related to Information Systems (IS) such as knowledge sharing (Bender and Fish 2000), technology adoption (Bhattacherjee 2001) exemplify this point. The investigation of the continuous investment in the B2B marketplace enables us to understand the mindsets of the SMEs and why they continue its adoption (or abandonment), thus extending the current literature on the B2B marketplace. Second, from an organizational decision-making perspective, deliberating between cost savings (i.e., by not reinvesting) and the potential benefits of reaching out to an extensive pool of buyers (i.e., by continuing to invest) is a dilemmatic issue (Zhu 2004). Third, from the marketplace operator’s perspective, it is more advantageous to retain existing firms who have adopted the marketplace rather than to attract new firms, which incidentally, largely comprise SMEs. The understanding of the considerations of SMEs is thus especially important for the operator to design better strategies for retaining existing firms, and to improve on the services provided. Fourth, to gain a deeper understanding, we interviewed 20 SMEs in the Yangtze River Delta region of Mainland China, a region which is one of the commercial hubs of the Chinese economy. From our interviews, we learnt that SMEs are frequently confronted (i.e., on an annual basis) by the predicament of whether to continue adopting the B2B marketplace, although many of them admitted to failing to realize the much publicized benefits of being connected to buyers. The dilemma of whether to continue B2B adoption is prevalent. For these reasons, this research seeks to investigate such a decisional situation by proposing and validating a set of factors, which could potentially influence the decision of an SME to continue (or abandon) the adoption of the B2B marketplace.

Drawing on the real option theory, we propose a research model, which takes into consideration the factors of the continuance costs, the potential benefits entailed by adoption, the uncertainty of the realization of the benefits and the flexibility in decision-making, as well as the cognitive and affective deliberations in continued adoption of the B2B marketplace. The research model was subsequently validated through a survey involving 74 SMEs in the Yangtze River Delta region. The findings could inform researchers, SMEs and B2B marketplace operators by providing a deeper understanding of why SMEs continue (or abandon) the adoption of the B2B marketplace.

THEORETICAL BACKGROUND

Continuing Adoption

Prior studies relating to the continuing information technology adoption have mainly investigated the determinants influencing the continuing decision (De Guinea and Markus 2009). Our careful review of the current research suggests that there are two main factors that are pivotal in influencing such behavior, i.e., cognition and affective (Bhattacherjee 2001; De Guinea et al. 2009). The expectation-confirmation theory postulates that an IS continuous model, which suggests that cognitive beliefs (perceived usefulness) and affect (satisfaction) would influence people’s intention to continue using information systems (Bhattacherjee 2001). In addition, Guinea et al. (2009) believe that cognitive thinking and emotion, are two main factors that would result in continuing IT usage. Revert back to much broader information processing literature, we learn that there are two forms of continuing behavior, namely unwarranted continuance and warranted continuance (Tiwana, Keil and Fichman 2006). Unwarranted continuance refers to “situations in which the decision to continue a project can be seen as irrational because expected benefits have been sufficiently lowered or remaining costs have sufficiently increased... [making the continuance] no longer economically justified” (Tiwana et al. 2006). Conversely, warranted continuation denotes “situations in which the decision to continue a project is reasonable because, even though negative events have transpired since the project was initiated, the expected future benefits of continuing outweigh the costs” (Tiwana et al. 2006). The deliberation of continuance (be it unwarranted or warranted) is a direct reflection of cognitive-affective elaboration. Based on...
the above research, this study hence examines how these two facets (i.e., cognition and affection) influence a manager’s decision to continue the adoption of a B2B platform. Continuing adoption, in our research context, is defined as the willingness of an SME to continue investing in a B2B marketplace, i.e., to continue being listed on the B2B website.

As discussed earlier, we identify that there are two processes which will transpire when people make a B2B platform continuing adoption decision (Shiv and Fedorikhin 1999). One process creates affective reactions, which are often relatively automatic (Shiv et al. 1999). The underlying argument of this affective perspective is that many important decisions are made in emotion-driven conditions denoted by different affective states (Ragunathan and Pham 1999). Studies have highlighted that there are three primary affective states with different valences, i.e., the positive, neutral and negative states (Ragunathan et al. 1999; Wright and Bower 1992). Negative events usually evoke strong and rapidly psychological and emotional responses (Taylor 1991). Anxiety is one of the most widespread negative emotions (Ragunathan et al. 1999), which may greatly influence people’s decisions in uncertain and risky environments (Locander and Hermann 1979). As anxiety is closely related to our context, we focus on examining the influence of anxiety on decision-making because an investment in B2B is fraught with considerable risks (Ragunathan et al. 1999).

The other process involves cognitive reactions, which are more related to people’s rational considerations. Compared with the affective process, the cognitive process is relatively deliberate and controlled. The central principle underlying this cognitive perspective is that a decision-maker (e.g., the manager of an SME who makes organizational decisions) focuses on rational factors by performing meticulous processing. Leading from this, a warranted continuation would thus be the manifestation of a decision-maker who senses a cognitive assertion that he/she will gain potential value by continuing adoption. The potential value is always manifested by two types of values, that is, the perceived net value and the perceived options value (Majd and Pindyck 1987; Prest and Turvey 1965). The perceived net value is conceptualized as the net benefits (i.e., benefits after taking into account the costs entailed) of a continued presence in the B2B marketplace (Kim and Kankanhalli 2009). It, to some extent, measures the negative or positive consequences of continuing investment according to some certain parameters (e.g., the historical rate of investment return). Under such consideration, a manager makes a decision according to the anticipated outcome of the project. The perceived options value refers to a manager’s perception of the potential positive value under the consideration of uncertainty and flexibility (e.g., the great development of electronic commerce encouraged by government) (Tiwana et al. 2006). Specifically, managers perceive the value of the opportunity for them to intervene across the investment’s trajectory, thus confronting various uncertainties. The real option value aims to capture the value of real options qualitatively. Different from and supplementing the net value, comprehension of the options value enables us to understand that managers could divert a project’s course on the basis of new information, instead of adhering to problematic projects, to avoid systematic undervaluation (Tiwana et al. 2006).

**Real Option Theory**

The tenet of the real option theory suggests that uncertainty in investment projects could result in high options value by considering the value of managerial flexibility (Tiwana et al. 2006). A real option (i.e., a choice) is often denoted by the perceived right to “invest resources” (e.g., labor, money, time) rather than an obligation of doing so (McCarter, Mahoney and Northcraft 2011). When a decision-maker involves uncertainty in the decision-making process, a real option affords an attractive “psychological hedge” in the mind of the decision-maker because such an option value enables this decision-maker to believe that there is potential for a brighter future. The real option theory was originally conceived in the context of the financial market where corporate decision-makers need to make decisions with the expectation that they can make adjustments in the future in response to external or internal events of the future (Kogut and Kulatilaka 2004). IS researchers have applied the theory to explore IT-investment related issues (Benaroch and Kauffmann 1999), such as risk management in IT projects (Benaroch 2002; Benaroch, Lichtenstein and Robinson 2006) and investment decision making in IT project (Benaroch et al. 1999; Benaroch and Kauffmann 2000; Benaroch, Shah and Jeffery 2006; Campbell 2002; Fichman 2004; Tiwana et al. 2006). In consideration of the difficulty in calculating the real option quantitatively, the assessment of such value is crucial (Kogut et al. 2004; Tiwana et al. 2006). In the next section, we present our research model focusing on the perceptual assessments developed on the basis of the real option theory.

**Research Model and Hypotheses**

Figure 1 features the research model. The model dictates that the decision to continue the adoption of the B2B marketplace is a cognitive-affective deliberation, manifested by 1) cognitive assessments, as reflected by the perceived value (net benefits) of the B2B marketplace and the perceived options value, and 2) affective reflection, made manifest by perceived anxiety. In relation to the cognitive assessments, we argue that the considerations of the costs and benefits of continuing to adopt the B2B marketplace, i.e., continuance costs and perceived benefits, would affect the perceived value (i.e., net benefits) of the B2B marketplace; while the situational assessments, i.e., the perceived uncertainty and perceived managerial flexibility, would
affect the perceived options value. We further add that the “negative” considerations, i.e., continuance costs and uncertainty, would invoke the affective feeling of anxiety.

Continuing Adoption

As discussed previously, we argue that the decision to continue to adopt the B2B marketplace results from a cognitive-affective deliberation. From the cognitive perspective, we propose that the perceived net value and the perceived options value be made to correlate with the decision to continue to adopt the B2B marketplace. The perceived net value refers to benefits relative to the costs. It is suggested that a rational decision-maker would be inclined to continue adopting the B2B marketplace if the net value of doing so is high (Kim et al. 2009). On the other hand, the perceived options value refers to the value of decisional options (e.g., continuing to adopt the B2B marketplace) after taking the uncertain factors into consideration (e.g., the B2B marketplace may not reveal all the information about the firms who are in and have access to that marketplace). According to Tiwana (2006), the tendency to continue adoption is a function of the set of real options that are available for focal decision-making. In other words, a rational decision-maker would be more likely to continue to adopt the B2B marketplace if the perceived options value (i.e., the value of doing so after taking into consideration the uncertainty about the future and potentially insufficient available information) is high.

From the perspective of affection, we propose that the arousal of anxiety, a form of emotional distress, in the decision-maker, could negatively affect the decision to continue adoption of the B2B marketplace. (McFarland and Buehler 2012) Anxiety is defined as an emotion triggered by high insecurity over an outcome and low control over a situation (Raghunathan et al. 1999; Roseman 1984). According to the mood congruency theory, negative moods lead to negative memories, judgments, and thoughts (McFarland et al. 2012). Thus, when managers are anxious, they may display cues of the negative outcomes of continuous adoption. Specifically, Raghunathan et al. (1999) found that anxious decision-makers were systematically biased in favor of low-risk or low-reward options. Thus we posit:

**H1:** The perceived net value of maintaining a presence in the B2B marketplace is positively related to the decision to continue adoption of the B2B marketplace.

**H2:** The perceived options value of maintaining a presence in the B2B marketplace is positively related to the decision to continue adoption of the B2B marketplace.

**H3:** Anxiety is negatively related to the decision to continue adoption of the B2B marketplace.

Cognition

This study focuses on two cognitions, namely the perceived net value and the perceived options value.
The perceived net value here is a function of “get” component (benefits) and “give” component (costs) (Lin and Wang 2006). The traditional value is based on the thesis of the cost-benefit analysis (Tiwana et al. 2006), which argues that a decision-maker would assess the ratio of the benefits of carrying out an action and the costs in doing so. Lin (Lin et al. 2006) also postulated that the perceived value involved a consumer’s assessment of the ratio of perceived benefits to perceived costs. Therefore, we hypothesize:

**H4a:** The perceived continuous cost is negatively related to the perceived net value of maintaining a presence in the B2B marketplace.

**H4b:** The perceived benefit of a B2B marketplace is positively related to the perceived net value of maintaining a presence in the B2B marketplace.

We propose that the perceived options value, which is the net assessed utility of a decisional option (e.g., continuing to adopt the B2B marketplace) after taking into account the ambiguity in predicting the future, is affected by the perceived uncertainty (i.e., what could happen in the future) and the perceived flexibility (i.e., how one can react in the future). According to the real option theory, uncertainty is defined as “an investment’s risk or volatility in cash flows that results from the inability to predict behaviors related to the economy, market, technology, or organization” (Benaroch et al. 1999; Lankton and Luft 2008). Uncertainty could stem from a lack of information about the market (and hence the lack of capability to predict with confidence). Using intuitive thinking from the real options theory, which is distinguished from traditional theory by responses to uncertainty, causes a shift from fear of uncertainty and minimizing investments to seeking gains from uncertainty (Leslie and Michaels 1997). Greater uncertainty would result in more valuable options (Busby and Pitts 1997). Consequently, we hypothesize:

**H5a:** Perceived uncertainty is positively related to the perceived options value.

Perceived flexibility denotes the ability of the decision-maker to discover future opportunities and/or to make responsive actions in the face of unfavorable initial outcomes (Adner et al. 2004). Studies on perceived flexibility, in the context of investment, are related to the availability of decisional options, such as deferring investment, changing the scale of investment, phasing the investments into stages, and abandoning and growing investments (Trigeorgis 1993). The presence of different options could affect a decision-maker’s perceptions of an initiative value (e.g., that of the B2B marketplace) and his/her expressed likelihood of continuing to commit to an initiative (Tiwana et al. 2006). Due to perceived flexibility, an SME decision-maker could quickly readjust the original strategy to meet changing environmental and market conditions (Yeo and Qiu 2003). In other words, the greater the perceived flexibility a decision-maker senses, the greater is the value of the options perceived. Thus, we hypothesize:

**H5b:** Perceived flexibility is positively related to the perceived options value.

Previous studies suggest that various uncertainties could require different forms of managerial flexibility. In addition, more uncertainties would result in more forms of managerial flexibility (Benaroch 2002). Indeed, Benaroch et al. (1999) also noted that as the sources of uncertainty increase, so would the computational complexity. Hence, we hypothesize:

**H5c:** Perceived uncertainty is positively related to perceived flexibility.

**Affection**

Anxiety is an emotional response to situations, especially when the potential outcome is perceived to be harmful (Raghunathan et al. 1999). Mischel et al. (1995) noted that anything that could produce important consequences, whether they are harmful or beneficial, can engender an emotional reaction. Software development projects often incur excessive costs and face other unmet risks (Ropponen and Lyytinen 2000), which may induce project failure. Costs, if they exceed benefits, may result in loss. Thus, one main factor that would result in harmful outcomes would be the costs, which may consequently result in negative feelings like anxiety. Moreover, an investment decision is usually subject to considerable uncertainty, and the decision-maker would find it difficult to map the future outcome of the investment behavior (Tiwana et al. 2006). When people find themselves facing outcomes of uncertainty and a lack of control, they are likely to feel anxious (Raghunathan et al. 1999). Therefore, we hypothesize:

**H6a:** Continuous cost is positively related to anxiety.

**H6b:** Perceived uncertainty is positively related to anxiety.
METHODOLOGY

Measurement

Most of the prior research on real options did not use questionnaires to test their models. Thus, 50% of our measurement items were self-developed, including the continuous costs, perceived benefits, perceived uncertainty and perceived flexibility. We developed those measurement items based on their definitions and descriptions in prior literature (Moore and Benbasat 1991). Other measurement items were adapted from previous researches. The adapted items were modified to fit our research context. We used card sorting to evaluate the content validity of the measurements (Moore et al. 1991). The kappa value for the relationship is 0.796, indicating high agreement. Table 1 contains a list of all the constructs.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Items</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived</td>
<td>1) Reduces marketing costs</td>
<td>Self-developed</td>
</tr>
<tr>
<td>Benefits</td>
<td>2) Reduces the numbers of staff members</td>
<td>(Quaddus and Hofmeyer 2007)</td>
</tr>
<tr>
<td></td>
<td>3) Reduces paper work</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4) Shows the organization’s presence</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5) Increases sales turnover</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6) Increases ability to compete</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7) Creates a better relationship with suppliers/buyers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1) Reduces marketing costs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2) Reduces the numbers of staff members</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3) Reduces paper work</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4) Shows the organization’s presence</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5) Increases sales turnover</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6) Increases ability to compete</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7) Creates a better relationship with suppliers/buyers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1) A lot of time and money needed to continue adoption of this e-marketplace.</td>
<td>Self-developed</td>
</tr>
<tr>
<td></td>
<td>2) Overall, I need to invest a lot of money if I were to continue adoption of this e-marketplace.</td>
<td>(Jones, Mothersbaugh et al. 2002)</td>
</tr>
<tr>
<td></td>
<td>3) All things considered, I need to put in a great deal of effort if I were to continue adoption of this e-marketplace.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4) I need to spend a lot of time and money if I were to continue adoption of this e-marketplace.</td>
<td></td>
</tr>
<tr>
<td>Continuance</td>
<td>1) Investments in this e-marketplace can be incrementally funded in stages.</td>
<td>Self-developed</td>
</tr>
<tr>
<td>costs</td>
<td>2) The scale of investments in this e-marketplace can be expanded</td>
<td>(with reference to Fichman, 2004; Tiwana et al. 2006; Two et al. 2003)</td>
</tr>
<tr>
<td></td>
<td>3) The scale of investments in this e-marketplace can be reduced.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4) Investments in this e-marketplace can be abandoned prior to completion.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5) The efforts and money expended on this e-marketplace won’t be fruitless, even if I stopped investing in this e-marketplace.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6) Investments in this e-marketplace are a necessary foundation for developing future business opportunities.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7) It is possible to adopt a ‘wait and see’ attitude before deciding to invest in this e-marketplace.</td>
<td></td>
</tr>
<tr>
<td>Perceived</td>
<td>1) Considering the uncertainty and flexibility, I think investments in this e-marketplace.</td>
<td>Self-developed</td>
</tr>
<tr>
<td>Flexibility</td>
<td>2) There are uncertain factors such as competitor moves, demographic changes, substitute products, etc during the period of investment in this e-marketplace.</td>
<td>(with reference to Huchzermeier and Lch, 2001)</td>
</tr>
<tr>
<td></td>
<td>3) The operating costs of the investment in this e-marketplace are entirely foreseeable.</td>
<td></td>
</tr>
<tr>
<td>Perceived</td>
<td>1) Considering the uncertainty and flexibility, I think investments in this e-marketplace.</td>
<td>Adopted</td>
</tr>
<tr>
<td>Uncertainty</td>
<td>2) There are uncertain factors such as competitor moves, demographic changes, substitute products, etc during the period of investment in this e-marketplace.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3) The operating costs of the investment in this e-marketplace are entirely foreseeable.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4) There is uncertainty in the outcomes of the investments in this e-marketplace.</td>
<td></td>
</tr>
</tbody>
</table>
Options Value

1) e-marketplace will succeed in adding value to my firm.
2) Considering the uncertainty and flexibility, my firm will lean towards continuing to invest in this e-marketplace.
3) Considering the uncertainty and flexibility, investments in this e-marketplace are beneficial to my company generally.

(Tiwana et al. 2006)

Anxiety

1) I worry quite a bit over possible troubles arising from this investment.
2) I often find myself worrying about something when making a decision.
3) I often felt that I am facing so many difficulties I am unable to overcome.

(Adopted
Taylor 1953; Locander and Hermann 1979)

Perceived Net Value

1) Despite the time and effort that I have to spend, continuing investing in this e-marketplace is worthwhile.
2) Despite the losses that I have to incur, continuing investing in this e-marketplace has a positive value.
3) Despite the hassles that I have to encounter, continuing investing in this e-marketplace is beneficial to me.

(Adopted
Kim and Kankanhalli 2009)

Continue to Adopt

How likely is it that you would choose to continue to remain in this e-marketplace?

(Adopted
Keil, Tan et al. 2000)

Table 1. Survey Items

Data Collection

The survey method was chosen to validate our research model, while a questionnaire was designed to collect data. SME managers were asked to complete the questionnaire. Data was collected from businesses located in the Yangtze River Delta Economic Region, specifically in the cities of Wuxi and Hangzhou. This area was chosen for testing our research model because it is one of the most economically developed areas in China. A total of 74 SME managers participated in the survey. We spent more than half a month visiting all the pre-appointed 74 companies individually to ensure that the questionnaires were completed proficiently, and also to avoid any response bias.

At the beginning of the survey, participants were asked to choose any one of the B2B marketplaces that they were participating in. The questionnaire consisted of multiple Likert-scale items. Each item was measured on a 7-point scale: (1- strongly disagree; 2- moderately disagree; 3- slightly disagree; 4- neutral; 5- slightly agree; 6- moderately agree; 7- strongly agree).

Data Analysis

To examine the measurement and structural models, PLS structural equation modeling was chosen as the data analysis tool, which is capable of analyzing relatively small samples (Wang and Haggerty 2011). Table 2 contains a list of the descriptive statistics of respondents.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Data</th>
<th>Age</th>
<th>Data</th>
<th>Revenue (million RMB)</th>
<th>Data</th>
<th>Employynum</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>45 (60.8%)</td>
<td>1 (10-19)</td>
<td>0</td>
<td>1(&lt;2.5)</td>
<td>17 (23.0%)</td>
<td>1(1-49)</td>
<td>39 (52.7%)</td>
</tr>
<tr>
<td>Female</td>
<td>29 (39.2%)</td>
<td>2 (20-29)</td>
<td>29 (39.2%)</td>
<td>2(2.5-5)</td>
<td>4 (5.4%)</td>
<td>2(50-99)</td>
<td>18 (24.3%)</td>
</tr>
<tr>
<td></td>
<td>3 (30-39)</td>
<td>24 (32.4%)</td>
<td>3(5-7.5)</td>
<td>9 (12.2%)</td>
<td>3(100-149)</td>
<td>3 (4.1%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4 (40-49)</td>
<td>17 (23.0%)</td>
<td>4(7.5-10)</td>
<td>8 (10.8%)</td>
<td>4(150-199)</td>
<td>4 (5.4%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 (50-59)</td>
<td>4 (5.4%)</td>
<td>5(10-12.5)</td>
<td>5 (6.8%)</td>
<td>5(200-249)</td>
<td>3 (4.1%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6(12.5-15)</td>
<td>5 (6.8%)</td>
<td>6(250-299)</td>
<td>1(1.4%)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 2. Descriptive Statistics of Respondents

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Mean (SD)</th>
<th>Cronbach’s Alpha</th>
<th>Composite Reliability</th>
<th>AVE</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Perceived options value</td>
<td>4.83 (1.14)</td>
<td>0.95</td>
<td>0.96</td>
<td>0.79</td>
<td>0.89</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Perceived net value</td>
<td>5.13 (1.28)</td>
<td>0.94</td>
<td>0.96</td>
<td>0.90</td>
<td>0.43</td>
<td>0.95</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Anxiety</td>
<td>4.87 (1.21)</td>
<td>0.84</td>
<td>0.90</td>
<td>0.76</td>
<td>0.25</td>
<td>-0.10</td>
<td>0.87</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Continuous costs</td>
<td>5.07 (1.41)</td>
<td>0.95</td>
<td>0.97</td>
<td>0.87</td>
<td>0.19</td>
<td>-0.05</td>
<td>0.49</td>
<td>0.94</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Continue to adopt</td>
<td>4.35 (1.43)</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>0.54</td>
<td>0.32</td>
<td>0.06</td>
<td>0.05</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Perceived flexibility*</td>
<td>4.63 (0.87)</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>0.73</td>
<td>0.24</td>
<td>0.41</td>
<td>0.40</td>
<td>0.43</td>
<td>n/a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Perceived benefits*</td>
<td>4.91 (1.11)</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>0.42</td>
<td>0.51</td>
<td>0.12</td>
<td>0.04</td>
<td>0.40</td>
<td>0.32</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>8. Perceived uncertainty</td>
<td>5.45 (1.10)</td>
<td>0.93</td>
<td>0.96</td>
<td>0.88</td>
<td>0.40</td>
<td>-0.12</td>
<td>0.48</td>
<td>0.45</td>
<td>0.27</td>
<td>0.60</td>
<td>0.12</td>
<td>0.94</td>
</tr>
</tbody>
</table>

Note: “*” refers to constructs have formative items; n/a refers to “not applicable”.

Table 3. Descriptive Statistics, Correlations, Reliability and Validity

The formative measures are evaluated on the basis of the significance of their weights (Wang et al. 2011). Table 4 lists the weights of measures for the perceived benefits and perceived flexibility of the formative items. Only two dimensions of perceived flexibility are significant contributors to their constructs in our research context.

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Indicators</th>
<th>Weights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Benefits</td>
<td>Reduces marketing costs</td>
<td>0.10</td>
</tr>
</tbody>
</table>

Table 4. Weights of Measures of Constructs with Formative Items

Smart PLS was used to analyze the structural model, to test the path coefficients and the significance levels of the paths. The results are presented in Figure 2. Out of 10 hypotheses, four were not supported (i.e., H1, H3, H4a and H5a). We will discuss the reasons for this in the following section.
Our findings indicate that continuing adoption of the B2B marketplace by SMEs mainly depends on the perceived options value (POV) rather than the perceived net value (PNV) and anxiety. The POV accounts for 30% of the variances in continuing adoption of the B2B marketplace by SMEs. This suggests that the decisions managers make in continuing to adopt the B2B marketplace is mainly determined by their perceived options value, rather than by the perceived net value and anxiety. This may be due to the current situation regarding SME investment in e-commerce in China. Our interview with SME managers revealed that SMEs have yet to invest sufficiently in terms of effort and financial investments in the B2B marketplace and hence have received little in terms of profit. They remain in the initial stages of e-commerce investment. As a result, they do not expect to receive substantial returns in the short-term, but are rather focusing on the long-term opportunities. In addition, they are making small investments in adopting the B2B marketplace, and keeping their options open, to reduce potential losses as much as possible (Bowman and Hurry 1993).

Interestingly, we find that continuous costs do not influence the PNV. During the interviews, the managers indicated that considerable amounts of money were spent on e-commerce; and that they deemed such spending as acceptable investment. In other words, they mainly focused on the benefits rather than the costs. It was also noted that uncertainty had no significant influence on the POV. On the contrary, the results indicated that uncertainty had a negative effect on the POV. One plausible reason is that as uncertainty increases, options values increase while risks remain fixed (Seung-Hyun, Peng and Barney 2007). Managers may also perceive the risks that are induced by uncertainty, in turn reducing the effects of uncertainty on the perceived options value. In fact, according to the extant literature, the relationship between investment and uncertainty is negative. For example, Sarker (2000) argued that a higher level of uncertainty could have a negative effect on investment value. SMEs have just entered the B2B marketplace, and thus they are bound to face much uncertainty. This explains the negative effects. However, we find that uncertainty will significantly influence the POV indirectly, which means that the greater the uncertainty, the greater is the opportunity for flexible exploitation, and the higher would be the POV (Busby et al. 1997).

Implications

This research contributes to current literature in three ways. First, to the best of our knowledge, this is one of the earliest studies examining the decisions of SMEs to continue adoption of the B2B marketplace. Although prior studies have enriched our understanding of the factors that would influence the managers to adopt continued adoption of the B2B marketplace (Liu et al. 2008; Thatcher et al. 2006), there has hitherto been no research addressing the continuous adoption of the B2B platform. We have found that, in face of negative feedback on investments, the perceived real options value has an important role in the continuous adoption behavior. Specifically, we also defined the comprehensive determinants of continuing adoption. Second, previous studies applying the real option theory typically perceived value to be manifested by the options value (Bowman et al. 1993; McCarter et al. 2011; McGrath 1997). The cognitive-affective perspective unveils overall factors that managers are likely to examine in the decision-making process. Third, this study proposes that uncertainty and perceived flexibility could be correlated. Our results further reveal that the perceived uncertainty of an SME is not directly related to the perceived options value, but rather, mediated by the perceived flexibility. This finding again extends the current literature on investigating the relationship between uncertainty and the perceived options value in B2B marketplace investment.

This study also provides two important practical implications. First, our results reveal that the determinants that SME managers consider when making a continuous investment are closely related to how they perceive the future of such investments. In the presence of such a phenomenon, it is vital that B2B platforms focus on to make the future much brighter. A statistical report indicates that the total global value of B2B transactions in 2010 had risen to 7 trillion, and this figure has seen rapid increases in subsequent years. The knowledgeable SME managers may be aware of the potential opportunities that exist in the B2B marketplace, but not all SME managers are aware of this development. This, to some extent, limits their understanding of commercial information and significant predictions. Therefore, the platforms could raise awareness of B2B markets as platforms worth investing in. Second, considering that SME managers are significantly concerned about the options value, this presents an opportunity for B2B platforms to offer better services to the SMEs, thus retaining their continuing presence and increasing their profit margins. Conventional wisdom advocates that the cost of cultivating a customer is always much higher than the retaining of an existing customer. Thus, the B2B platforms need to devote more attention to how they could improve the perceived options values of SME managers through diverse approaches.
Limitations and Directions for Future Research

Our research has several limitations. First, we collected only 74 sets of data, which is a relatively small number. However, it was more difficult to collect corporate data than that of individuals. In a future study, we could collect more data from other areas, instead of simply focusing on Wuxi and Hangzhou. Second, it is possible that respondents had a “social desirability” bias (they might have overestimated their intention to continue adoption). Third, we asked only one manager to complete the questionnaire for each SME. This may limit the validity of the results. On a positive note, most managers of the SMEs involved made all the decisions.

CONCLUSION

Building on the real option theory, this study seeks to examine this decisional situation by proposing and validating a set of factors, which could potentially influence the decision of an SME to continue (or abandon) the adoption of the B2B marketplace. Results from a survey involving 74 SMEs reveal that the perceived flexibility in such an investment significantly affects the perceived real option value, which in turn affects the inclination of an SME to continue adopting the B2B marketplace and thus maintain a presence.

REFERENCES


