

## Predicting electronic commerce adoption in Chilean SMEs<sup>☆</sup>

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### Abstract

The Theory of Planned Behavior is used to predict a variety of behaviors, but its use in dealing with predicting e-commerce intentions in small-to-medium-sized enterprises (SMEs) and in developing countries is limited. We use the TPB to model intentions to adopt e-commerce among 212 managers/owners of SMEs in Chile. Hierarchical regression results show that the subjective norm and attitude constructs positively and significantly predict intentions, but the perceived behavioral control construct does not. Results can be used by developing countries, especially those in Latin America, to encourage the adoption of e-commerce among SMEs.

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Information technology (IT) adoption is critical to the growth of an economy (Kendall et al., 2006). Although IT adoption has been researched by academics for more than a decade and many theories attempt to explain IT adoption in different domains, there are still several critical components related to IT adoption that have not yet been thoroughly investigated. First, among studies that focus on technology adoption, only a small percentage is devoted to the adoption and use of electronic commerce (e-commerce) in small- and medium-sized enterprises (SMEs). The contribution of SMEs is extremely important to the economy and rapid growth of developing countries. In Chile, for example, 80% of the economy is dominated by SMEs (<http://www.genexiachile.com/pymes/pymes1.htm>), while 49% of the employment is generated by SMEs (<http://cowles.econ.yale.edu/~engel/arts/pymeweb.pdf>). In addition, small businesses differ from large businesses in terms of IT adoption patterns (Cragg and King, 1993; Lee and Runge, 2001). For example, SMEs often find technology difficult to implement due to resource constraints (Raymond,

1985; Street and Meinster, 2004). Thus, more research is needed to validate whether theories that explain IT adoption in large businesses conform to the context of SMEs.

Second, there is a need to validate existing theories in different contexts. The majority of IT adoption research focuses on the technologically developed world, mostly because the majority of research/academic institutions are located in developed countries such as the USA, Canada, and the United Kingdom. The issue is complicated further because IT adoption is not seen as transferring well to less developed countries (Sukkar and Hasan, 2005). Overall, developing countries account for 85% of the worldwide population, but generate only 20% of the gross internal product (Ceballos, 2001). Therefore, the need to understand whether existing theories apply to populations in developing countries is an important issue.

Third, much of the research concerning IT adoption in SMEs, particularly those focused on developing countries, is merely descriptive and lacks a strong theoretical basis (e.g., Farhoomand et al., 2000; Simpson and Swatman, 1999; Stylianou et al., 2003; Wresch, 2003). To overcome the above-mentioned research gaps, the objective of this study is to apply a well-established, robust theory to predict e-commerce adoption intentions among managers/owners of SMEs in a developing country, Chile. The project's results may help other countries in the Latin American region find strategies to

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encourage adoption of e-commerce to enhance their economic growth.

### 1. E-commerce — an overview

Although there are many potential advantages of e-commerce (Awad, 2004; Schneider, 2004; Turban et al., 2004), the use of it in small businesses remains limited. A study by Forrester Research finds that only two in five small businesses use the Internet to sell products and services (Weiss, 2004). It seems that top managers and owners of SMEs recognize the importance of having an Internet presence (CyberAtlas, 2000; OPEN Small Business Network, 2002 Monitor), however, only a small portion of them use the Internet for commercial purposes.

Some descriptive research regarding SMEs and e-commerce adoption occurs in an international domain. Stansfield and Grant's (2003) research examines attitudes toward e-commerce adoption and the impact of government policy on Internet connectivity and e-commerce adoption in 484 SMEs in Scotland. They suggest that lack of knowledge, skills, and support are the main barriers of adopting e-commerce by small businesses. Similarly, Farhoomand et al. (2000) name the major barriers that slow the acceptance of e-commerce in Hong-Kong and Finland. They report that a) technical barriers, such as lack of adequate infrastructure, b) organizational issues, such as resistance to change, c) economic limitations, such as cost to implement e-commerce, d) political issues, such as limited control or limited access to the Internet in certain countries, e) cultural barriers, such as resistance to online shopping, and f) legal issues, such as the acceptance of electronic signatures, are major barriers to e-commerce.

### 2. Predicting e-commerce adoption with the Theory of Planned Behavior

The Theory of Planned Behavior (TPB: Ajzen, 1991) is an especially well-established intention model that successfully predicts and explains behavior across a wide variety of domains (c.f., Chang, 1998; Hausenblas et al., 1997; Taylor and Todd, 1995). The TPB is an extension of the Theory of Reasoned Action (TRA: Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975). The TRA posits that intention is determined by the individual's attitude, the degree to which a person has a favorable or unfavorable evaluation of the behavior in question, and subjective norm, the perceived social pressure to perform or not to perform the behavior. In one TRA study, Hartwick and Barki (1994) find that impacts of attitude and subjective norm differ depending on whether use of technology is voluntary or not.

Ajzen (1991) argues that the original model (TRA) is unable to deal with behaviors over which people have incomplete volitional control. Thus, the TPB includes a third predictor of intention, perceived behavioral control (PBC), which reflects an individual's perceptions that there exist personal and situational impediments to the performance of the behavior. Ajzen (1991) summarizes 16 studies that use the three TPB constructs to

predict a variety of intentions (e.g., intention to lose weight, attend class, give a gift, etc.) and reports that the average correlation among the TPB predictors and intention is very high (.71). Pavlou and Fygenon (2006) examine whether the TPB constructs can predict an Internet user's decision to purchase a product online in a sample of American consumers. Attitude and perceived behavioral control explain a significant portion of the variance in adoption intentions, but subjective norm is not a significant predictor of behavioral intention in this context. Harrison et al. (1997) test the TPB in the context of small business executives' decisions to adopt information technology. Their research finds that all three TPB constructs predict unique variance in adoption intentions, with the attitude construct as the strongest predictor.

### 3. Measuring the TPB constructs

The TPB constructs of attitude, subjective norm, and perceived behavioral control can be measured through direct and indirect means. Ajzen (1991) provides some guidelines to generate direct measures of the three TPB constructs, however, he also says that the appropriate items representing the constructs should be unique to the behavior under consideration and elicited from the target population of respondents (Ajzen, 2002a). Direct measures of attitude measure a respondent's positive or negative evaluation of the intention behavior. For instance, small business owners can be asked whether incorporating e-commerce in their firms is good/bad, helpful/harmful, positive/negative, etc. Direct measures of subjective norm reflect agreement (or disagreement) with statements that refer to other people's beliefs about performing the behavior under examination, and direct measures of PBC reflect perceptions about the difficulty of performing the behavior. Most TPB studies to date use the direct measures approach, but indirect, belief-based measures have an advantage of providing insight into the cognitive foundation underlying perceptions of behavior (Ajzen, 2002b).

These indirect measures are calculated by the cross product of beliefs structures and other factors. For example, attitude is measured by behavioral beliefs ( $bb_i$ ) that performing a behavior will lead to a particular outcome, weighted by an evaluation of the desirability of that outcome ( $e_i$ ), expressed as  $A = \sum bb_i * e_i$ . For instance, a person may believe that using e-commerce will speed up business transactions ( $bb_i$ ) and may consider this a highly desirable outcome ( $e_i$ ). High values of attitude would be indicative of an individual's intention to adopt the target technology. Indirect measures of subjective norm are indicated by normative beliefs ( $nb_j$ ) concerning a particular referent weighted by the motivation ( $mc_j$ ) to comply with that referent ( $SN = \sum nb_j * mc_j$ ). For example, an individual may believe that the firm's sales department thinks that one should use e-commerce ( $nb_j$ ) but that complying with the wishes of the sales department is relatively unimportant ( $mc_j$ ). Thus, high values of subjective norm indicate high pressure to adopt the technology in question. Finally, indirect measures of perceived behavioral control are represented by the sum of control beliefs ( $cb_k$ ) weighted by the perceived facilitation ( $pf_k$ ) of the control belief

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