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Understanding Country Level Adoption of E-Commerce:
A Theoretical Model Including Technological, Institutional, and Cultural Factors

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ABSTRACT

This paper provides a theoretically grounded model of e-commerce adoption to explain differences in adoption rates among countries. The model extends the existing culture-policy-technology (CPT) framework to examine causal relationships between the technological, institutional, and cultural factors in order to examine country-level e-commerce adoption. Thus, interesting relationships among macro-level factors are hypothesized. The paper highlights the important of risk mitigating mechanisms or institutions to facilitate adoption of e-commerce in countries with high uncertainty avoidance. A call for empirical examination into country level adoption is answered by analyzing macro level data from 69 countries. The hypotheses are confirmed using PLS analytical procedures. The study is timely as e-commerce technology has now taken hold in several countries but its revenues in proportion to the overall total revenues remain low. The study is motivated by significant different in e-commerce adoption rates among countries. The paper makes significant contributions to literature and practice.

KEYWORDS

Country Environment, Cross-Country Studies, E-Commerce Adoption, Efficacy of Institutional Safety-Net, Government Policy, Maturity and Reach of Internet Technologies, Uncertainty Avoidance

1. INTRODUCTION

In an ICT (Internet and Communication Technologies) enabled interdependent world, most countries consider e-commerce as a significant instrument for economic growth (Merhi & Ahluwalia, 2018; Zhu & Thatcher, 2010). However, despite early promise, overall e-commerce revenues remain insignificant in comparison to the overall business volumes (D'Onfro, 2015; Edquid, 2017) and e-commerce adoption at the global level remains low (Commission, 2011; EUR, 2013; Postnord, 2014; Stambor, 2010). Research shows that e-commerce adoption rates among different countries and regions exhibit significant variations (Zhu & Thatcher, 2010; Statista, 2017). For example, in 2017 e-commerce sales accounted for only 2.2% of the total retail sales in India, 23.1% in China, and 16% in Korea (Statista, 2017). Disparities exist even within the same continent or the same group of nations (developed vs. emerging). For example, in Europe, online shoppers in the age group between 15 and 79 ranged from less than 40% in Italy to more than 80% in United Kingdom (Postnord, 2014). Statista (2017) reported that in 2017 the share of e-commerce sales in the total retail sales is 19.1% in UK, 12.6% in Denmark, and 7.9% in Germany. According to a study by Business.com in 2017,

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the e-commerce share of total retail sales in Japan 5.4%, France 5.1%, Canada 5.7%, Russia 2%, and Brazil 2.8% (Edquid, 2017). The question then arises, "what causes such variations?" Additionally, because of gradual and consistent accretion in e-commerce trade volumes in recent times, governments across the nation states are focused on improving their share in the overall global trade. Therefore, it is important to examine the important drivers of e-commerce adoption at a country level.

In the existing literature, studies focusing on macro-level determinants of e-commerce adoption are few; most of this research mainly emphasizes individual and organizational environments (Delone & Mclean, 2004; Grandon et al., 2011; Chiu et al., 2014). Although individual and firm level factors are important, they do not explain significant differences in e-commerce adoption among countries. Moreover, because of sampling constraints, the generalization of the results reported in the existing research that examine macro-level determinants of e-commerce adoption is rather limited. Most existing studies focus on adoption factors within one country (Stylianou et al., 2003; Yoon, 2009; Al-Hudhaif & Alkubeyyer, 2011; Jehangir et al., 2011). Also, a significant number of these studies are based on qualitative methodology (Aleid et al., 2009; Choudrie & Dwivedi, 2005). As a result, Tan et al. (2007) called for empirical research into cross-cultural and cross-country analysis of e-commerce adoption factors.

Moreover, most existing research examining e-commerce adoption by higher-order entities is exploratory and is not theoretically grounded, the only exceptions being Molla and Licker (2005b). They proposed the perceived e-readiness model based on the interactionism doctrine; but this model is targeted for organizations, not countries (Molla & Licker 2005b). Bajaj and Leonard (2004) proposed the CPT model targeted toward country-level e-commerce adoption in which they identified Culture, Policy, and Technology as the main first-order drivers underlying adoption. This paper draws from the CPT framework (Bajaj & Leonard, 2004) to propose a causal model that includes technological, institutional, and cultural factors as antecedents of e-commerce adoption. In doing so, we introduce increasingly pertinent factors (e.g. perceived efficacy of safety nets as an antecedent of e-commerce adoption) and drop factors that have become irrelevant (e.g. hard-wired vs wireless Internet). The present paper draws from the CPT framework yet significantly extends its propositions. With the passage of nearly 15 years since the CPT framework was initially published, there have been radical changes in the Internet and e-commerce milieu. With significant evolution in the quality, availability, and accessibility of wireless Internet as well as very high level of diffusion of wireless Internet, the user-perceptible differences between wireless and hard-wired Internet access have virtually disappeared. For example, the CPT framework considers hard-wired Internet and wireless Internet as separate technological factors. Additionally, the CPT model advances propositions based on logical arguments. This paper significantly advances the research of Bajaj and Leonard (2004) by grounding the present research in established theories. Even though building upon the CPT framework, this research does not very strictly associate each of the factors included in the research model in a higher order factor. For example, the PEISN factor presented in the paper may be described as a cultural factor but also has significant policy implications. Yet another distinction between the CPT model and the research model presented in this paper is that we do not claim that our model provides comprehensive explanation of e-commerce adoption by countries. Unlike in Bajaj and Leonard (2004), we investigate a causal model to investigate the relationships among various factors of interest.

Now, we briefly introduce the factors included in our model, but expand their discussion in the subsequent sections of the paper. The technology drivers are captured in the composite index called "Maturity and Reach of Internet Technologies (MRIT)." MRIT includes dimensions such as accessibility, adequate bandwidth, diffusion of mobile networks, and implementation of security protocols. Research shows that governments are the primary agents for devising and implementing policies and creating channels for investments towards implementation of IT infrastructure (Picot & Wernick, 2007; Stoica et al., 2005); thus, government's focus on IT is a key driver of MRIT. Based on the Theory of Planned Behavior (TPB) and the Social Cognitive theory (Bandura, 1986), we argue that the perceived efficacy in using technology is an important driver of e-commerce adoption. We