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Infrastructural Drivers of Online Shopping: An International Perspective

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ABSTRACT

While online shopping expenditures have been increasing in both developed and developing economies, they still account for a small share of total retail sales. Significant differences also exist across countries in the amount of money consumers spend on a per capita basis on online purchases. The authors utilize the conceptual foundations of infrastructural framework to examine the effects of infrastructural drivers on online shopping expenditures in 43 countries. Findings show that per capita telecommunications investments and per capita gross national income are significantly associated with per capita online shopping expenditures. Privacy protection, Internet penetration, and credit card penetration were not significant.

KEYWORDS

Credit Card Penetration, Internet Penetration, Internet Shopping, Online Purchases, Privacy Regulations, Telecommunications Infrastructure

1. INTRODUCTION

The Internet has significantly transformed consumers' shopping experiences by expediting product search, facilitating price comparisons, and reducing transaction costs. Taking advantage of these conveniences, consumers have shifted some of their purchases to the online channel. However, while consumers' preference for the online channel has resulted in increasing online sales, data show that online sales across countries still account for a small share of total retail sales. In the U.S., for example, after more than four decades of the commercial launch of the Internet, e-commerce sales were about 5.8% of total retail sales in 2013, increasing from 5.2% in 2012 (U.S. Census, 2014). And in China, where the compound annual growth rate from 2003 to 2011 was 120%, the highest growth rate in the world, the share of e-commerce sales to total retail sales was only between 5 to 6 percent (McKinsey, 2013).

To explain online shopping activities, existing research has mostly focused on demographic characteristics (Akhter, 2003; Chang and Samuel, 2004) and attitudinal and motivational determinants such as beliefs, risk averseness, norms, intentions, and perceived value (Brashear et al., 2009; George, 2004; Lim, 2015). In contrast to the large body of research on demographic and psychological determinants, the literature on infrastructural drivers of online shopping is still in the early phase of development (Travica, 2002; Sheth and Sharma, 2005; Alqahtani et al., 2012). A review of the literature also shows a dearth of empirical studies on the effects of infrastructural drivers on online shopping expenditures across countries.

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This study attempts to fill the above-mentioned gaps and contribute to the literature in three significant ways. First, it builds on the infrastructural frameworks developed in existing studies to formulate the hypotheses. Second, it tests the effects of three key infrastructural drivers (telecommunications, financial, and regulatory) on online shopping expenditures across countries. Third, it draws theoretical and strategic implications of the findings, adds to the existing knowledge on infrastructural drivers and online shopping, and guides strategic decision making.

To accomplish the research goals, the rest of the paper is organized into the following four sections. In Section 2, we discuss the theoretical frameworks and, in Section 3, we present the hypotheses. In Section 4, we discuss issues related to the sample and variables and present the results, and, in Section 5, we draw theoretical and managerial implications, discuss the limitations of the study, and suggest questions for future research.

2. THEORETICAL FRAMEWORKS

Existing research has delineated the linkages between infrastructural conditions and online transactions. Travica (2002), for example, conducted a field investigation to determine how infrastructural factors affect the diffusion of e-commerce. Interview and observation data showed that economic, telecommunications, and cultural factors favorably affect the potential for e-commerce. Simon (2004) also identified communication infrastructure and legal and societal factors such as privacy protection as critical success factors for facilitating electronic commerce in developing countries. Das et al. (2014) explored the effects of economic, legal/regulatory, and technological factors on music piracy and found that the primary factors that affect online piracy in a country are its economic status and regulatory status.

Sheth and Sharma (2005) classified countries based on their infrastructural development and proposed that the level of development in telecommunications and legislative bodies would affect e-marketing activities as well as consumer behavior. And Lawrence and Tar (2010) noted that underdeveloped states of telecommunications infrastructure, credit systems, and income would act as barriers to e-commerce activities in developing countries. In a recent report, the Euromonitor also emphasized the importance of developing adequate telecommunications and financial infrastructures to promote online shopping (Euromonitor International, 2012).

In addition to the roles of telecommunications and financial infrastructures, existing research provides meaningful insights into the role of privacy in influencing online shopping. A key conclusion from the current body of research is that while consumers appreciate the convenience of online shopping they remain apprehensive about the threat to privacy it poses. Privacy concern among consumers has been shown to be a significant determinant of online shopping and research shows that it negatively affects online purchases (Dubelaar et al., 2003; Zorotheos and Kafeza, 2009). What, however, is important to note about the privacy literature is that much of the scholarly attention has been applied to understanding the antecedents and consequences of privacy concern and not to examining the effects of the regulatory infrastructure that protects privacy.

Wirtz et al. (2007, p. 344) have emphasized the importance of examining the differences in the privacy approaches and practices of businesses and governments to “protect consumer privacy” in the different geographical regions of the world. Erbschloe (2001) also identified cross-country differences in privacy regulations as one of the key trends impacting the use of the Internet. Existing literature reveals that although the influence of infrastructural drivers on online shopping has been proposed, not much has been done to test the conceptual linkages empirically. Sheth and Sharma (2005) and, more recently, Das et al (2014), while hypothesizing the effects of infrastructural drivers on online

consumer behaviors, recommended that empirical studies should be conducted to test the proposed relations. Markus and Soh (2002) also suggested the importance of focusing on structural factors to explain differences in e-commerce activities across countries.

This study responds to the need for filling the gaps in the literature by examining the effects of three national level infrastructural drivers (telecommunications, financial, and regulatory) on online shopping expenditures in 43 countries. Findings from this study would contribute to our understanding of the effects of national-level infrastructural drivers on online shopping expenditures across countries. Below we present hypotheses related to the effects of regulatory (H1), telecommunications (H2 and H3), and financial (H4 and H5) drivers on online shopping expenditures.

3. HYPOTHESES

Privacy, as a psychological construct, is deeply embedded in the culture of a country. The desire to maintain privacy manifests itself in different types of behavior. In the online environment, for example, privacy concern has been shown to influence risk reduction behaviors (Phelps et al., 2000; Youn, 2009). Wirtz, et al. (2007) found that heightened privacy concern among consumers resulted in their engaging in different forms of risk reductions strategies such as fabricating personal information, using privacy-enhancing technologies, or even refusing to purchase. Besides influencing risk reduction behaviors, privacy concern also affects online transactional behaviors. When privacy concern increases, both the frequency of online transactions and online spending are negatively affected. Zorotheos and Kafeza (2009) found that when consumers were concerned about privacy, they were less likely to transact on websites that required personal information. Dubelaar et al. (2003, p. 70) summarized the linkages between privacy and shopping behavior by noting that the “perceptions of personal information privacy are directly linked to on-line purchasing behavior.”

Privacy concern is salient because of the massive amount of personal data that businesses collect to construct consumer profiles and develop marketing strategies. The concern about privacy is exhibited in what consumers want to reveal about themselves and the control they want to exercise over how personal information is acquired and used (Westin, 1967). In a survey, about 92% of the respondents indicated that they worry about their online privacy, while 74% said that they are more concerned about privacy now than they were a year ago (Bachman, 2013). Surveys and polls also show the concern that consumers have about the loss of privacy. In a multinational poll, about 80% of consumers in the United States, 79% in Germany, and 68% in the United Kingdom agreed that consumers have lost control over how companies collect and use personal information (IBM, 1999). In a recent article in *The Wall Street Journal*, 86% of Internet users reported taking steps to remove or mask their digital footprints and 68% of Internet users felt that privacy laws did not adequately protect them (Dwoskin, 2014).

In light of the concern that consumers have about privacy, many solutions have been proposed to protect privacy, including self-regulation by businesses, development of corporate business and ethical policies, as well as changes to public policy (Caudill and Murphy, 2000). While different proposals have been made to protect privacy, very little empirical work has been done to test their effectiveness (Caudill and Murphy, 2000). The growing concern about the invasion of privacy is also attributed to the lack of legal frameworks to counteract such invasions (Wijnholds and Little, 2001). When robust and adequate privacy protection regulations are in place, consumers would feel less concerned about interacting with a website (Wirtz et al. 2007). It has also been suggested that regulatory actions to protect privacy would be shaped by consumers’ concerns within countries (Singh and Hill, 2003). Bellman et al. (2004) noted that the high level of privacy concern is reflected in the enactment of privacy legislations in several countries. It can thus be expected that in countries where privacy protection is enforced stringently, consumers would feel more comfortable in using the Internet for making online purchases. Therefore, the following is proposed.

H1: Higher privacy protection enforcement is associated with higher levels of online shopping expenditures.

An efficient telecommunications infrastructure is essential for the smooth conduct of online shopping activities. Simon (2004, p. 35) noted that a “country’s readiness for e-commerce depends on network infrastructure.” The underlying foundation of the Internet is technological and, therefore, online shopping expenditures would be high in countries where significant investments in telecommunications infrastructure have been made. Data also show that differences exist among countries in the level of e-commerce sales due to differences in telecommunications infrastructure (Ho et al., 2011). Countries that have invested in telecommunications infrastructure provide their citizens greater opportunities to move from the traditional bricks and mortar businesses to the online markets (Oxley and Yeung, 2001). In a more sophisticated telecommunications environment, consumers would be able to easily log on to the Internet, search for product information, compare price, read reviews, and purchase the product. Therefore, the following is proposed.

H2: Higher investments in telecommunications infrastructure are associated with higher levels of online shopping expenditures.

Consumers need to be able to access the Internet to conduct online transactions. Although the Internet seems ubiquitous, access to this technology is not universal. Significant digital access divide exists at the international level, as the Internet penetration varies widely across the developed and developing economies. Comparatively, Internet penetration rates are higher in the developed economies. Increased access to the Internet enables people to engage in different types of online activities including online shopping. The level of Internet penetration would thus represent the size of the e-commerce market in a country (Ho et al., 2011). Countries with higher Internet penetration rates will thus show higher levels of online shopping. Therefore, the following is proposed.

H3: Higher Internet penetrations are associated with higher levels of online shopping expenditures.

Income provides consumers the financial means to make a purchase. The level of income also influences the perception of the value of time. As income increases, the perceived monetary value of time also increases. Thus, people with different levels of income would value the time spent on making a purchase differently. As higher income people would place greater monetary value on time, the opportunity costs of the time spent on the different phases of the purchasing process will be higher for them. They will thus be more inclined to making purchases on the Internet to save time.

Although the purchasing power and opportunity cost arguments suggest a positive link between income and online buying, empirical data on the impact of income on online transactions show mixed results. Patwardhan and Yang (2003) found income to be not a significant predictor of online shopping, whereas Goldsmith and Flynn (2005), Hannah and Lybecker (2010), and Lohse et al. (2000) found income to be positively related to online shopping, frequency of online shopping, and spending. Taking into consideration the argument that the value of time increases with rising income and that the variety of purchases that consumers make also increases with rising income, we argue that as per capita income increases online shopping will also increase. Therefore, the following is proposed.

H4: Higher per capita gross national income is associated with higher online shopping expenditures.

The online shopping environment is especially suitable for the use of credit cards (Bulut and Koprulu, 2010). In the online environment, credit cards serve as a convenient mechanism for making a purchase (Oxley and Yeung, 2001). After the purchase decision has been made, consumers can provide

credit card information to the firm and complete the transaction. The advantage of using credit cards is that payments for purchases are deferred to the next billing cycle when it can be paid in full or in reduced monthly installments. Research also shows that consumers enjoy the convenience of using credit cards and thus tend to overspend (Gan et al., 2008). While the availability of credit cards makes it convenient to conduct online transactions, data show that consumers do not enjoy the same level of access to this financial instrument across countries. Credit card penetration varies across countries and in countries where penetration is high it can be hypothesized that online shopping would also be high. Markus and Soh (2002) noted that availability of credit cards in the financial infrastructure can explain differences in e-commerce activities across countries. Kenny (2003) had also noted that lack of credit cards can restrict the use of the Web for transactional activities. Therefore, the following is proposed.

H5: Higher credit card penetration is associated with higher online shopping expenditures.

4. METHOD

The multiple regression technique was used to test the proposed hypotheses. The statistical procedure measures the degree to which each of the independent variables contributes to the prediction of the dependent variable. The dependent variable was per capita online shopping expenditures. The five independent variables were privacy protection enforcement, per capita telecommunications investments, Internet penetration, per capita income, and credit cards penetration. Privacy protection enforcement reflects the regulatory infrastructure driver. Per capita telecommunications investments and Internet penetration reflect the telecommunications infrastructure drivers. Per capita income and credit cards penetration reflect the financial infrastructure drivers.

4.1. Sample

In conducting international research involving secondary data, researchers generally end up working with the sample of countries on which data are available. They, thus, confront two key questions, one dealing with sample size and the other dealing with the appropriateness of the data for testing the hypotheses. For this study, the size of the sample was determined by the availability of data on all six variables. Data on all six variables were available for 43 countries, which constituted this study's sample size (see Appendix A for the list of countries). The sample size of 43 is considered appropriate for conducting regression analysis.

4.2. Variables

Privacy enforcement rankings for the sampled countries came from Privacy International, an organization created jointly by US-based Electronic Privacy Information Center and the UK-based Privacy International (Privacy International, 2007). The data that Privacy International provides is based on a comprehensive survey of global privacy enforcement and has been used in existing research (Bellman et al., 2004). The international ranking of privacy enforcement in each country is based on the following criteria:

- Is there a regulatory body with sufficient powers to investigate privacy infractions?
- Can the regulator act proactively?
- Does the regulatory body act in an effective way?
- Have cases been taken through the administrative and legal systems?

Each of the above-mentioned criteria relates directly to the ability and willingness of governments and policy makers to enforce privacy within their countries. Privacy International measures the level

of enforcement in each country on a scale of 1 through 5, with 1 representing lax privacy enforcement and 5 representing stringent privacy enforcement. The data provided by Privacy International was used in this study.

For telecommunications infrastructure drivers, the two variables were telecommunications investments and Internet penetration. Telecommunications investment was measured as the expenditures associated with acquiring the ownership of telecommunication equipment infrastructure, which include land, buildings, and computer software. The expenditure included both new installations and additions to existing installations. Total investment was divided by population to obtain per capita investment in telecommunications infrastructure. Internet penetration was measured as the percentage of population with access to the Internet.

For financial infrastructure drivers, the two variables were per capita national income and credit card penetration. Per capita income data was obtained by dividing the gross national income of the country by its population. Credit card penetration was calculated as the number of credit cards per thousand people in each country.

The dependent variable was per capita online shopping expenditures which included sales generated through pure e-commerce websites and through sites operated by store-based retailers. Sales data is attributed to the country where the consumer is based, rather than where the retailer is based. It thus represents online shopping within each country. Data on the dependent variable and telecommunications and financial drivers were obtained from Euromonitor International (2014).

4.3. Results

Results from the multiple regression analysis show the significance of telecommunications and financial infrastructures in explaining per capita expenditures on online shopping. The significant variable in telecommunications infrastructure drivers was per capita telecommunications investments and the significant variable in financial infrastructure drivers was per capita income. Results also show that privacy protection regulations, Internet penetration, and credit card penetration were not significant (see Table 1 for parameters estimate and significance level). The overall R-square for the proposed model was .699.

5. CONCLUSION

Findings support the hypotheses of positive influence of per capita telecommunications investments and per capita income on online shopping expenditures. A developed telecommunications infrastructure creates a transactional environment that is conducive to the growth of online shopping. As the ease of using the Internet for transactional purposes increases, consumers tend to spend more money on

Table 1. Regression Model Coefficients

Variables	B	Std. Error	β	t-value	Sig.
(Constant)	-31.342	45.806		-.684	.498
Privacy Enforcement	-15.934	14.498	-.122	-1.099	.279
GNI Per Capita	.004	.002	.523	2.514	.016
Percent of Net Users	.776	1.120	.118	.693	.492
Credit Card Penetration	-.004	.029	-.016	-.136	.892
Telecomm Infrastructure	.293	.144	.291	2.040	.049

Dependent Variable: Per capita online shopping expenditures

online shopping. Expenditures on online shopping also increase as consumers' income increases. Consumers with higher per capita income spend more on online shopping.

This study also hypothesized positive association between privacy protection regulations and online shopping. It was argued that with more stringent privacy enforcement regulations, consumers would feel more confident about privacy protection and thus would be less inhibited in making online purchases. Although this line of reasoning led to the above stated hypothesis, the result did not support the proposed linkage. However, what should be noted is that the non-significance of privacy regulations does not mean that consumers do not value privacy. This would not be a justifiable conclusion as the finding of this study is not based on whether people knew about the regulations or how they perceived them. What can be concluded, based on the finding, is that the stringency of privacy protection regulations did not significantly influence per capita expenditures on online shopping.

Internet penetration, the proportion of people with access to the Internet, was non-significant in explaining per capita expenditures on Internet shopping. What this could suggest is that the ability of people to access the Internet does not make them more inclined to spend more on online purchases. Credit card penetration was also non-significant. The proposal of positive association between credit card penetration and online shopping expenditures was based on the argument that consumers would find the convenience of using credit cards to make online purchases appealing. Therefore, the higher the credit card penetration, the higher would be the expenditures on online shopping. The lack of significant relation between credit card penetration and online shopping can be traced to consumers' preference for using cash rather than credit cards (Slyke, et al. 2005). Studies show that Germans and Belgians, for example, do not like to use credit cards for making payments (Harrison-Walker, 2002).

5.1. Theoretical Implications

Existing research has focused mostly on demographic characteristics and psychological variables to understand consumers' online shopping behavior. Our research objective was to add to this literature by examining the role of infrastructural drivers in influencing per capita expenditures on online shopping. Per capita telecommunications investment was found to be a significant facilitator of online shopping expenditures. Online transactions are conducted on the telecommunications infrastructure, and thus the more advanced this infrastructure is the easier it is for consumers to make online purchases. When consumers can search product related information, compare product offerings, and make and execute purchase decisions easily and quickly, they become more likely to make purchases and spend more. An efficient telecommunications infrastructure, resulting from investments in its development, serves as a digital highway for the smooth flow of information, facilitating interactions between consumers and online businesses. Thus, differences across countries in investments made in the telecommunications infrastructure would explain variations in per capita online shopping expenditures.

With respect to the financial driver, per capita income was found to be a significant facilitator of online shopping expenditures. As per capita income increases, online shopping expenditures also increase. The significant finding supports the argument that higher levels of income give people the discretionary purchasing power that results in higher levels of expenditures on online shopping. The finding also supports the argument that as income increases, the opportunity costs of time spent on making a purchase increase. People with higher income would thus find the convenience of buying online appealing and, furthermore, as they make a variety of purchases due to higher income, the amount of money they spend on online shopping would also increase.

5.2. Managerial Implications

Managerial implications of findings from this study relate to two key strategic decisions that firms make: how to select international markets and how to develop them. For firms wanting to succeed internationally, the selection of markets plays a decisive role. The growth of international sales is predicated on how well a firm is able to analyze and select country markets. Among the different steps of the international market selection process, market analysis occupies a key position, acting as

a bridge between the decision to internationalize and the selection of markets. Thus, the knowledge of the variables that affect online sales potential in different country markets would be considered highly valuable to firms. Findings from this study show that countries that have invested more on telecommunications infrastructure and have high per capita income will have higher levels of online sales relative to countries that have invested less and have low income.

Higher levels of telecommunications infrastructure and income are linked with more developed and competitive markets. In these country markets, not only the propensity to spend more on online purchases but also competitive intensity would be high. In contrast, countries which have embarked on developing their telecommunications infrastructure and are expected to increase per capita income would experience an increase in online sales in the future. Thus, the managerial implication relates to selecting a country market that is either developed or has the potential to develop.

Another implication, although not directly flowing from the findings, covers the issue of market development. After a market is selected, firms face the difficult question of market development. For online businesses, this involves the development and continuous enhancement of websites to increase sales. Quelch and Klein (1996, p.72) noted that firms will have to strategize on how to “maintain, grow, and manage their sites.” The recommendation is that firms need to develop country-specific websites if they wish to exploit the differential international marketing opportunities. Although English is considered the global language of commerce, its exclusive use would make some international consumers feel that they are not welcomed. In addition, when developing the websites, firms need to understand that there are cross-cultural differences that influence how consumers may respond to the different elements of a website such as color, font, logos, and images (Harrison-Walker, 2002).

5.3. Limitations and Future Study

The limitation of this study relates to the sample size, as the analysis was conducted on a small sample of countries. While this limitation can affect the validity of findings, it is generally unavoidable in international studies that are based on secondary data. With respect to this study, however, the sampled countries cover two key characteristics that allay the concern about the validity of findings. First, they come from different regions of the world and, second, they include countries that are at different stages of economic development (see Appendix A). These two characteristics enhance confidence in the validity of the study’s findings.

This study opens several avenues for future research. However, the three areas that seem promising are the following. First, future research can examine the level of awareness among people about the different aspects of privacy-related regulations and how this awareness affects online behaviors. Second, future research can explore whether consumers trust that privacy regulations are there to protect their interests and how this trust shapes their online behaviors. Third, future research can focus on the tradeoffs between privacy and convenience, that is, how much privacy people are willing to sacrifice to enjoy the convenience of using the Internet for transactional purposes.

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APPENDIX

Exhibit 1

Countries Sampled

Argentina
Australia
Austria
Belgium
Brazil
Bulgaria
Canada
China
Czech Republic
Denmark
Estonia
Finland
France
Germany
Greece
Hungary
India
Ireland
Israel
Italy
Japan
Latvia
Lithuania
Malaysia
Netherlands
New Zealand
Norway
Philippines
Poland
Portugal
Romania
Russia
Singapore
Slovakia
Slovenia
South Africa
Spain
Sweden
Switzerland
Taiwan
Thailand
United Kingdom
USA

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