

# Information & Communication Technology Access, Human Resource Development, and Political & Regulation Environment on Business on customer e-commerce for Online Retailers Business

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## Abstract

ICT and E-commerce can enable business and organizations to advertise and sell their products and brands electronically, ICT also enables firms to receive payments for products online and this enhance the operational performance of the business. This research paper explores and creates an online environment for pharmaceutical retailers in Thailand. The drivers of business to customer E-commerce have also been identifying in the study through the mediating role of technological turbulence. The given research study mainly relied on cross-sectional information and data from about 430 employees that worked in top online pharmaceutical firms in Thailand. The data of the research were calculated and analyzed through the use of KMO and the structural equation modeling technique. The findings of this research paper indicate that business to customer E-commerce at the national level can be significantly affected by information and communication technology access, HR development and political regulations. The findings of the study provide a fresh concept and awareness about ICT access and HR development at the national level. The results of the study help many online businesses and also help them to understand the role played by technological turbulence and ICT access.

**Keywords:** ICT access, political environment, regulation environment, HR development, B2C E-commerce.

## I. INTRODUCTION

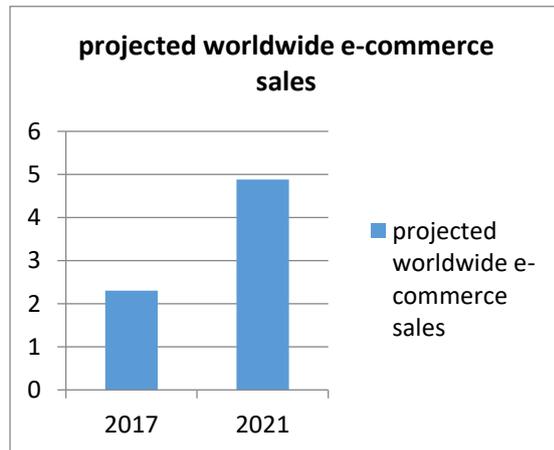
E-commerce has gain worldwide importance and priority in the business sector around the globe (Kang & Kim, 2019). Firms are not heavily reliant on the internet for the marketing and sale of their products and services (Iyer, Germain, & Claycomb, 2009; Rodríguez-Ardura & Meseguer-Artola, 2010). The main reason behind this is the large increase in the number of online customers as shown in the table 1. In the year 2018, the number of online customer has increased to 1.8 billion, which is nearly one-sevenths of the total population of the world (Adam, Alhassan, & Afriyie, 2020).

Table 1.1: *Online purchase worldwide (Statistica 2019)*

Year	People (Billion)
2013	1
2018	1.8

E-commerce has caused drastic changes in the way trade is being done in the current era, however some countries have already adopted e-commerce system rigorously and some countries have not adopted it on a large scale (Zheng, 2016). US, Europe and Asian countries are now working to expand their e-commerce systems rapidly (Awiagah, Kang, & Lim, 2016; Pappas, Kourouthanassis, Giannakos, & Lekakos, 2017). The B2C e-commerce area

specifically focuses on the ability of the firms to advertise, using electronic medium (Iddris, 2012). The B2C e-commerce is projected to grow tremendously with the increasing number of online customer segment (Farooq, Fu, Hao, Jonathan, & Zhang, 2019) that is bound to increase the organizational profits (Soto-Acosta, Popa, & Palacios-Marqués, 2016).



Graph 1.1: *Projected world-wide e-commerce sale*

Previous research works have studied the factors affecting e-commerce (Farooq et al., 2019; Kang & Kim, 2019; Kuizhen, 2019; Pappas et al., 2017; Soto-Acosta et al., 2016), however suggested that further investigation is required in the technological, environmental and organizational context for the online pharmaceutical industry (Adam et al., 2020), creating a gap in literature, which this study aims to fill. This study has the following research objectives:

- To examine the impact of ICT Access on Business to Customer e-commerce
- To examine the impact of PRE on Business to Customer e-commerce
- To examine the impact of HRD on Business to Customer e-commerce
- To examine the impact of technological turbulences as moderator in relationships of Information & Communication Technology Access, Political & Regulation Environment and Human Resource Development on Business to Customer e-commerce

The main purpose of this study is to examine the effect ICT Access, Political & Regulation environment and HRD has on the B2C e-commerce for online pharmaceutical retailers in Thailand. Theoretically, this study adds contribution to theory by investigating the boundary constraint mechanism through examining the effects of technological turbulence as moderator. Practically, this study has implications for practitioners who can recognize the value of human resources and develop them into a skilled labor force. Also, the study has implications for the policy makers who can design their infrastructure in a way to bridge the gap between citizens and provide more access to the ICT so that e-commerce could be adopted and utilized efficiently.

This paper has the following organization. The first section is the Introduction part, while the second section is the detailed review of literature on these variables. The next section presents the research methodology, while the fourth section shows the statistical results with analysis. The paper ends with discussion and conclusion, along with the research limitations and implications.

## 2. Literature review and Theoretical background

This paper is based on the framework of “Technology-organization-environment (TOE)”, proposed by (Depietro, Wiarda, & Fleischer, 1990) and the RBV theory. The TOE framework describes the process by which an organization adopts innovations influenced by the technological, organizational and environmental contexts (Adam et al., 2020; Kerdpitak, 2022a). According to the RBV theory, the technology and human serves as resources that aim to achieve organizational goals.

### 2.1 Impact of Information & Communications technology

E-commerce is the use of internet for purchase and sale of goods and services (Adam et al., 2020). Here, technology refers to all the internal and external technological

infrastructure of the firm and the IT human resources (Oliveira & Martins, 2009). Hence, different types of technologies are available to any firm (Dwivedi, Papazafeiropoulou, & Scupola, 2009). This infrastructure enhances the use and adoption of the various types of ICT systems available to the firm (Yu, Lin, & Liao, 2017). Studies have confirmed that ICT access largely influence e-commerce system (Aljowaidi, 2015; Depietro et al., 1990; Ferguson & Yen, 2006; Ibrahim & Stevens, 2014; Krishnan, Teo, & Lim, 2013). So, the level of ICT access is directly related to the B2C e-commerce (Adam et al., 2020; Kabanda & Brown, 2017; Kerdpitak, 2022b). So, this study hypothesizes:

H1: Information & Communications Technology Access is significantly linked to Business to Customer e-commerce

## 2.2 Impact of Political & Regulation environment

According to (Zhu & Kraemer, 2005), the environment refers to size and structure of firm and the political environment which includes law-making bodies. Studies have proved that the environment positively affects the e-commerce in any country findings from the studies of (Adam et al., 2020; Awiagah et al., 2016; Martinsons, 2008; Mohtaramzadeh, Ramayah, & Jun-Hwa, 2018) that PRE in a country influences its B2C e-commerce (Adam et al., 2020; Idris, Edwards, & McDonald, 2017). So, this study hypothesizes:

H2: Political & Regulation Environment is significantly linked to Business to customer e-commerce

## 2.3 Impact of Human Resource Development

The employees of any firm are a valuable asset and resource for the organizational

development. This implies that the education and training of are the main drivers that can improve the quality of its workers (Cui et al., 2017; Devaraj, Fan, & Kohli, 2002; Ho, Kauffman, & Liang, 2007; Kabanda & Brown, 2017; Sameni & Khoshalhan, 2006; Srivastava & Teo, 2006; Kerdpitak, 2022), hence the level of HR development in any organization can directly influence the B2C e-commerce (Adam et al., 2020; Idris et al., 2017; Wanyoike, Mukulu, & Waititu, 2012). So, this study hypothesizes:

H3: Human Resource Development is significantly linked to Business to Customer e-commerce

## 2.4 Moderation of Technological Turbulence

The technological turbulence is characterized by rapid changes in technology owing to change in consumer preferences, shorter product life cycles and increased competition. It becomes vital for organizations to address the needs of the changing technological environment (Hou, 2014) to strengthen their relationships with customers and attract them to purchase the firm's products through electronic network. The use of the modern technology helps the firms for better implementation of the e-commerce systems (Yu et al., 2017). Study by has suggested that technological turbulence has a moderating effect in the e-marketing abilities of the firm (Kuizhen, 2019), hence we can investigate the moderating effect of TT. So, this study hypothesizes:

H4: Technological Turbulence significantly moderates the effects of Information & Communications Technology Access, Political & Regulation Environment and Human Resource Development on Business to Customer e-commerce.

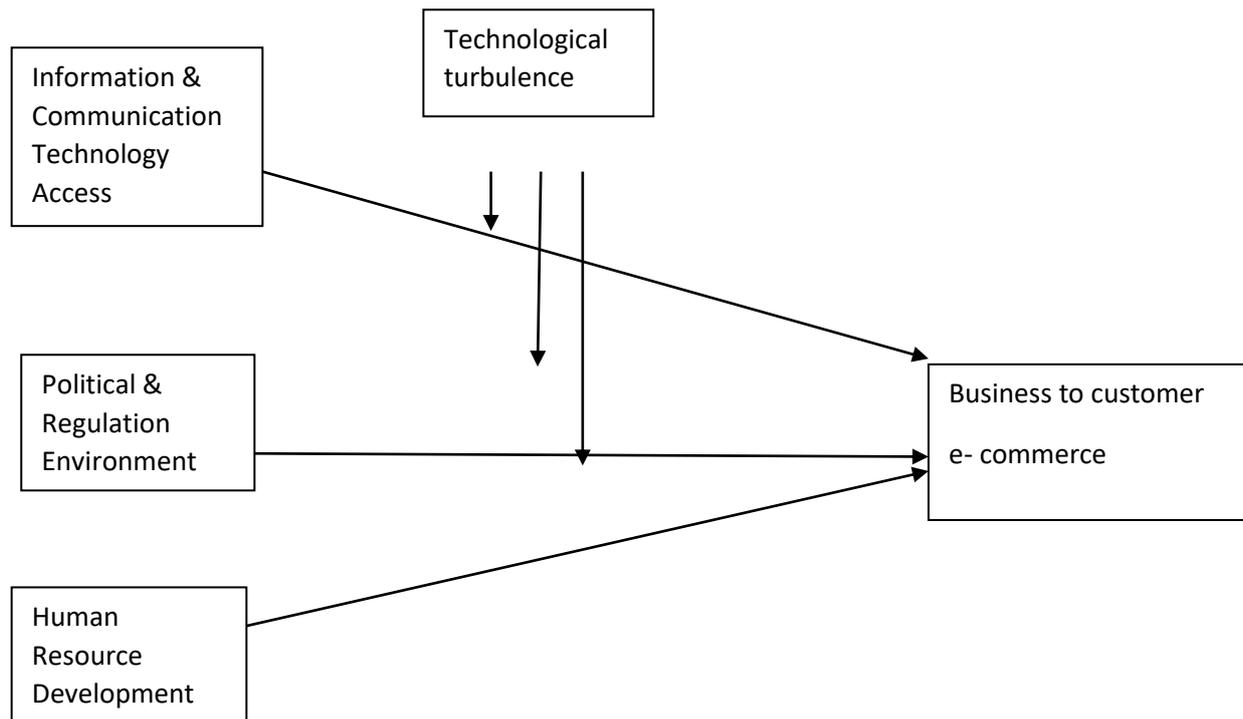


Figure 1.2: *Research framework*

### 3. Methodology

This research paper used the commonly adopted survey methodology (Dubey et al., 2019). The researcher has used Confirmatory Factor Analysis (CFA) to test the convergent and discriminant validity of the instrument in the first stage of analysis and Structural Equation Modeling (SEM) has been adopted in the second stage for analyzing the hypotheses of this research.

#### 3.1 Survey instrument and data collection

With the aim of evaluating the conceptual model developed in this research and to test the hypotheses, the researcher has designed a survey instrument to measure the constructs of this study. First of all, a draft was prepared for the survey questionnaire through two stage development and validation process. The first stage was used for checking the validity of the content of the questionnaire. In this stage, six professionals were requested to check and provide inputs regarding the validity of the questionnaire. Three of these professionals belonged to academia, one was an IT specialist and the rest two were industry specialists. The feedbacks from this panel helped the rephrasing

of the questions, rearranging the item sequences and improvements in clarity and readability. Moreover, the panel made sure that the survey was relevant to the context of the study i.e. the pharmaceutical industry in Thailand. The target was the population that comprised of executives in functional roles i.e. analysts, managers and engineers, working in the pharmaceutical industry of Thailand. Moreover, the researcher made sure that the participants had accurate knowledge regarding the studied practices. The questionnaires were sent out to 722 respondents from the 70 pharmaceutical firms selected randomly in Thailand. Email invitations were sent out to the potential participants. The invitation email included detail about the purpose and scope of the study along with the ethical considerations that were adopted in the process of data collection and analysis. The invitation emails were followed by reminder phone calls to make sure that the understandability of the questionnaire is achieved and maximum response rate is achieved (Singh & El-Kassar, 2019). A total of 252 questionnaires were received back after the waiting period. After removing redundant, incomplete and irrelevant responses, 430 responses were finalized to be included in the research. 22 non-respondents

were contacted to check for the non-response bias issues (Sheikh & Mattingly, 1981) and they were inquired about the reason for opting to not participate. Lack of information about the various constructs came forward as the most highlighted reason. The non-response bias was, however, considered irrelevant due to the fact that Chi-Square testing (McHugh, 2013) on demographics of early and late respondents showed that there was no significant difference among the two groups.

### 3.2 Measures

The constructs that comprised the research model have been measured using items that have been identified through literature. The data has been calculated using a five-point Likert scale that ranges from strong at 5 to weak at 1. The total items included in this survey, including the 6 items for demographic catching questions, are 25. The study by Adam et al. (2020) has been used to develop the 4 items to measure the ICT impacts, 4 items for HR development, six items for Political and regulatory environment and the two items for

B2C e-commerce. The technological turbulence was measured using 3 items developed using study by Wu, Liu, and Zhang (2017) and Li (2012).

## 4. Results and analysis

This research was carried out with a sample size of 430 people from Thailand, out of which 55.3 percent were males and 44.7 percent were females. Experienced employees from the pharmaceutical sector were selected where 42.3 percent had experience between 2 and 5 years. Around 42.8 percent lay in the 25-35 age group. The selected sample ensure validity of results because of the maturity of age and experience in the sample. The summary of descriptive statistics for this study has been given in Table 1. The values of minimum and maximum statistics confirm that there is no outliers in the data. An average response of 3.3 can be seen in the mean statistics.. The standard deviation calculations show no skewness in the data.

Table 1: *Descriptive Statistics*

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
InfoComTA	430	1.00	5.00	3.2229	1.04329	-.198	.118
HumRecDev	430	1.00	5.00	3.3781	1.00383	-.377	.118
PolRegEnv	430	1.00	5.00	3.5196	1.16841	-.550	.118
TechTurb	430	1.00	5.28	3.4367	1.12733	-.502	.118
B2Eomm	430	1.00	5.00	3.5597	1.14334	-.572	.118
Valid N (listwise)	430						

Table 2: *KMO and Bartlett's Test*

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.918
Bartlett's Test of Sphericity	Approx. Chi-Square	7788.819
	df	171
	Sig.	.000

Table no. 2 is depicting the results of KMO and Bartlett's Test. The purpose of this test is to confirm that sample size of data is accurate and value should lie between threshold range of 0.8

and 1. The result of KMO testing show the value of .918, thus for this study the sample is adequate.

Table no.3 depicts results for the accuracy and validity of data through rooted component matrix, which is a part of CFA. All the components carry factor loading greater than 0.7. No issue of cross loading is seen.

Table 3: Rotated Component Matrix<sup>a</sup>

Component					
	1	2	3	4	5
IT1		.802			
IT2		.877			
IT3		.835			
IT4		.792			
HR1			.746		
HR2			.782		
HR3			.783		
HR4			.826		
PR1	.842				
PR2	.849				
PR3	.843				
PR4	.889				
PR5	.912				
PR6	.900				
TT1				.843	
TT2				.860	
TT3				.851	
BC1					.852
BC2					.833

Table no. 4 shows the output of convergent and discriminant validity tests. CR and AVE are indicators for convergent validity (Hassan, Hameed, Basheer, & Ali, 2020; Iqbal & Hameed, 2020), having low threshold values of 0.7 and 0.5 respectively. Results show that there is convergent validity in data. As for discriminant validity, results given in the diagonal portion of table show that is showing that each variable is more associated with itself instead of other variables.

Table 4: Convergent and Discriminant Validity

	CR	AVE	MSV	IT	TT	BC	PR	HR
<b>IT</b>	0.917	0.735	0.354	<b>0.857</b>				
<b>TT</b>	0.922	0.798	0.301	0.464	<b>0.894</b>			
<b>BC</b>	0.852	0.742	0.327	0.510	0.449	<b>0.862</b>		
<b>PR</b>	0.969	0.837	0.301	0.475	0.549	0.493	<b>0.915</b>	
<b>HR</b>	0.877	0.642	0.354	0.595	0.488	0.572	0.483	<b>0.801</b>

Table 5: Confirmatory Factors Analysis

Indicators	Threshold range	Current values
CMIN/DF	Less or equal 3	2.265
GFI	Equal or greater .80	.893
CFI	Equal or greater .90	.959
IFI	Equal or greater .90	.958
RMSEA	Less or equal .08	.073

For confirming the fitness of the selected model, confirmatory factor analysis is carried

out, results of which have been depicted in Table no. 5. Results prove that the model is a good fit.

Figure 1: CFA

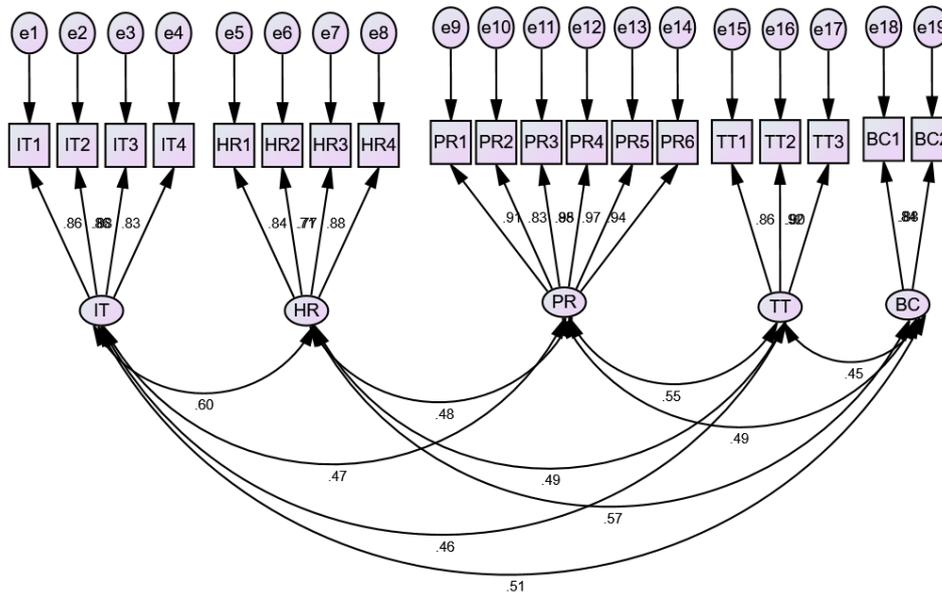


Table 6: Structural Equation Modeling

			Estimate	S.E.	C.R.	P	Label
B2Eomm	<---	InfoComTA	.174	.054	3.527	***	
B2Eomm	<---	PolRegEnv	.242	.045	5.290	***	
B2Eomm	<---	HumRecDev	.301	.056	6.074	***	

Table 6 shows the results for direct impacts in the model through SEM. The results show that the InfoComTA, PolRegEnv and HumRecDev all three have significant and positive direct impacts over the B3Eomm. The impact of InfoComTA is 17.4%, PolRegEnv is 24.2% and HumRecDev is 30.1%.

Figure 2: SEM

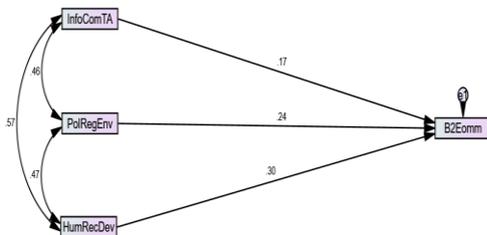


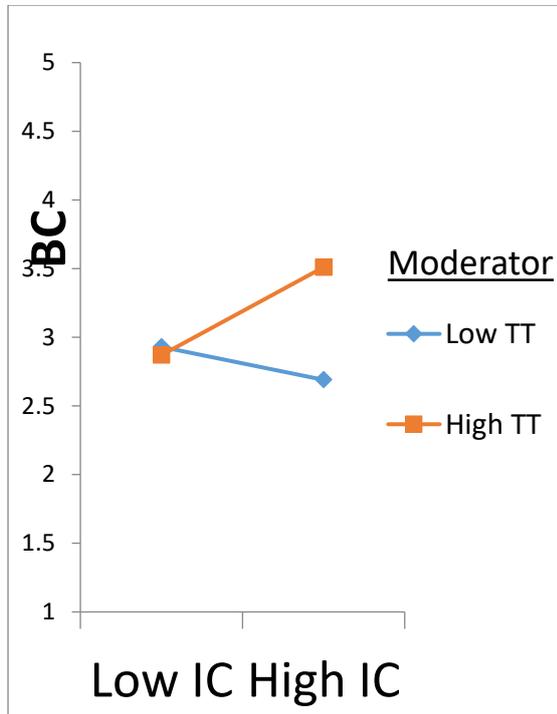
Table 7: Moderation Results

			Estimate	S.E.	C.R.	P
ZB2Eomm	<---	ZInfoComTA	.095	.038	2.490	.013
ZB2Eomm	<---	ICTAxTT_Int1	.200	.036	5.549	***
ZB2Eomm	<---	ZTechTurb	.190	.046	4.146	***
ZB2Eomm	<---	ZPolRegEnv	.194	.041	4.750	***
ZB2Eomm	<---	PRExTT_Int3	-.056	.035	-1.621	.105
ZB2Eomm	<---	ZHumRecDev	.234	.038	6.181	***
ZB2Eomm	<---	HRDxTT_Int3	.113	.034	3.324	***

The table 7 and the following three graphs show the results of moderation impacts in the taken research model for this research. The moderation variable in this research paper is technological turbulence. The results in table 7 show that the impact of TT on InfoComTA is not significant, while the result two are significant with PolRegEnv experiencing an

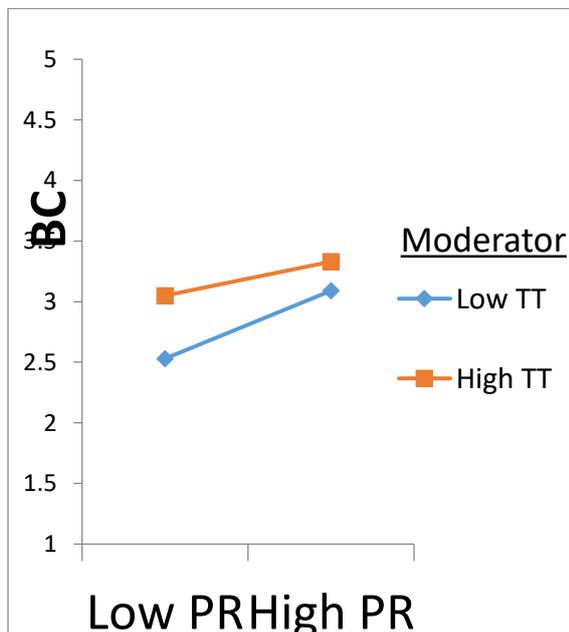
impact of 19.4% and HumRecDev experiencing an impact of 23.4%.

Graph 1: Moderation Impact of TT on IC

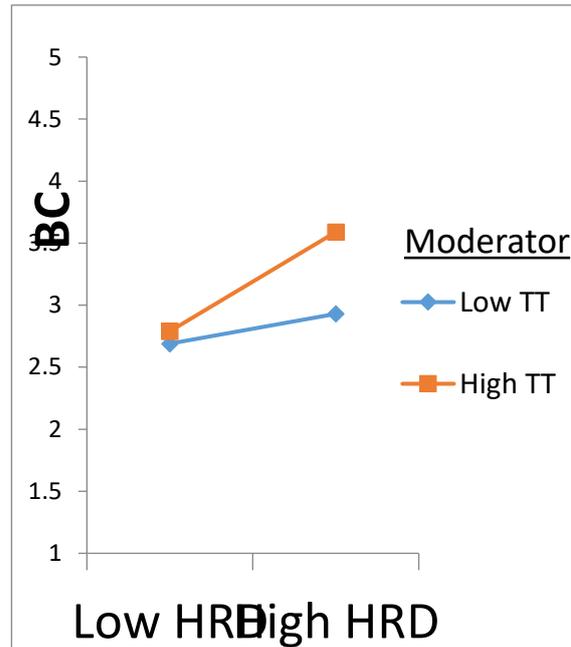


Graph 1 shows that the moderation Impact of TT on IC is not significant, which has also been shown in the table 7 and is seen graphically as the two graph lines are intersecting each other. The graph 2 shows that the moderation Impact of TT on PR is significant, mirroring the results in table 7.

Graph 2: Moderation Impact of TT on PR



Graph 3: Moderation Impact of TT on HRD



Graph 3 shows that the moderation Impact of TT on HRD is significant, which has also been shown in the table 7 and is seen graphically as the two graph lines are moving away from the intersection.

### 5. Discussion

Introduction to communication technologies or ICT and other electronic facilities has become the most crucial priority for many sectors in the world during the past few years. A research study by Stergiou and Psannis (2017) explained that the implementation of some advanced versions of ICT can directly lead to an effective online business environment because ICT provides convenient access to all data and information, thus the first hypothesis of the study has been accepted and supported to the results of the study. According to the measurements of results, it is indicated that the role of the political regulation environment is significant in the online business environment. This is because it provides minimized costs mainly through subsidizations and also enhances the performance of the business.

The results of the research also indicate that the impact of human resource development is significant on the business to the customer E-

commerce business. The main reason behind this significant impact of HR development is its significant nature. Human resource development programs play a significant role in improving the communication level of the business (Madanat & Khasawneh, 2018). Thus, the third hypothesis of the study has been accepted.

## 6. Conclusion

The main objective of the following study is to create an effective environment for online pharmaceutical retailers in Thailand mainly through the use of ICT access and HR development. The moderating impact of technological turbulence has also been explored to enhance the business to the customer E-commerce environment. The following study mainly relied on the cross-sectional information or data from about 430 employees that worked in some top pharmaceutical retailers of Thailand. The given research has also used specific methods to evaluate data such as SEM, descriptive statistics and CFA, etc.

### 6.1 Implications and Limitations

The given research provides some applications for future studies and practices. The findings of the given study make it possible for future practitioners to understand the impact of HR development and ICT access through the moderating impact of technological turbulence. The verdicts of the study also help policymakers of the online pharmaceutical sector of Thailand in creating a significant online business environment. The findings of the study will also be very helpful for online pharmacy retailers so that they can effectively use ICT technology. On the other hand, there are some limitations of the research, such as the study is highly dependent on the secondary type of data from different sources. Thus, future analysts must conduct a study that does not depend on secondary data. Second, the study could not consider all countries across the globe because the information was not available. Therefore, future research may extend the domain of study in other countries as well as other sectors.

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