INNOVATIONS

Barriers of e-commerce Adoption in Ethiopia; Large and Medium Scale Manufacturing Industries

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Abstract

The practice of e-commerce has become familiar in developed countries long years ago, but it is still at infant stage in developing countries. In Ethiopia, despite the fast growth of ICT infrastructures the practice of e-commerce is still in the first stage. Many factors could be a cause for low level of e-commerce adoption. This study is aimed at identifying the most important barriers that influence large and medium scale manufacturing industries in Ethiopia in order to adopt e-commerce. In this study, 330 large and medium scale manufacturing industries were selected using simple random sampling method. The data was collected from company managers using self-administered questionnaires which incorporated 26 barriers organized in to social & cultural, technical, economic, political, organizational, and legal & regulatory barriers. The finding of the study shows that the top barriers identified were related with lack of e-infrastructure, lack of e-trading legislations, external environmental factors and insufficient awareness about the benefit of e-commerce. In addition, the result from the t-test claimed that barriers identified in the study has a more influence on non-adopters than adopters. The paper has suggested recommendations for overcoming the barriers of adopting e-commerce in Ethiopia. This paper also contributes a lot for researchers who are interested to investigate about the barriers of adopting e-commerce in others sectors.

Key Words: 1.e-commerce 2. Adoption 3. Barriers 4.Manufacturing

I. Introduction

Aydın and Savrul (2014), stated that internet based economic activities such as e-commerce becomes a common phenomenon in the world today. According to Rahayu and Day (2017), the introduction of e-commerce would play a significant role to conduct effective marketing and exchange products and services online. Gangeshwer (2013), Sabraz , Rashida, and Gunapalan (2020), stated that e-commerce is the most dominant way in which economic development can be reinforced in the digital age. According to Terzi (2011), electronic commerce offers economic benefits to all countries and the gains for developed countries is in the short run, while developing countries will get more benefit in the long run. In Ethiopia, the growth and contribution of large and medium scale manufacturing industries is increasing from time to time. Asrie and Venkati (2012),stated that there is the low adoption of e-commerce in Ethiopia, and fully-fledged e-commerce has not yet been achieved in the country.

Studies conducted previously in other countries and in service sector in Ethiopia on the subject and the empirical evidences showed that e-commerce could bring profit and can also be practiced in the manufacturing sector. In Ethiopia, despite the fast growth of ICT infrastructures

in large and medium scale manufacturing industries, the practice of e-commerce is still in the beginning stage. According to El-fitouri (2020), "e-commerceis buying and selling of products, services, and ideas through internet and non-internet communication systems such as telephone ordering, interactive television, electronic messaging and electronic payment". Many factors could be a cause for low level of e-commerce adoption. This study aimed at identifying the important barriers that influence large and medium scale manufacturing industries in Ethiopia to adopt e-commerce and forward recommendations for implementing e-commerce successfully.

The finding of this study could contribute a lot for large and medium Scale Manufacturing industries in Ethiopia to be able to identify the possible barriers which affect the adoption of e-commerce and identify coping mechanisms. The Ethiopian government would also refocus its policies towards improving and facilitating the adoption of e-commerce in many sectors of the economy.

II. Literature Review

2.1. Definition of e-commerce

Although e- commerce has been used for many years as an interdisciplinary topic, with issues ranging from e-technology, addressed by computer experts, to consumer behavior, addressed by marketing research experts. But still, there is no single definition which expresses it exactly. Zwass (2001), defines e-commerce as the sharing of business information, maintaining business relationships and conducting business transactions by means of telecommunications networks. According to Licker and Motts (2000), e-commerce is usually linked with buying and selling over the internet or accompanying any transaction concerning the transfer of ownership to use goods or services through a computer-mediated network. Though the definition for e- commerce has slight difference among scholars, there is general consensus among researchers that the main components of e-commerce include: website, email, intranet, extranet, LAN and wireless area network (WAN), Voice over Internet Protocol (VOIP).

2.2. Challenges of e-commerce Adoption

Table (1) Challenges of adopting e-commerce

S. NO	Barriers to e-commerce	Sources
1.	Absence of legal and regulatory systems	Love, Irani, Cheng, and Tse (2001), Mohammed, Almsafir, and Alnaser (2013)
2.	Competitive pressure	Zaied (2012), Razavi, Hosseini, and Razavi (2014)
3.	Computer illiteracy	Abbad, Abbad, and Saleh (2011), Zaied (2012)
4.	Relatively High cost	Asrie and Venkati (2012), Iddris (2012), Zaied (2012)
5.	Low e-commerce infrastructure	Asrie, and Venkati (2012),Zaied (2012), Almousa (2013), Mohammed, Almsafir and Alnaser (2013)
6.	Low level of readiness among government institutions	Kapurubandara (2009), Zaied (2012)
7.	Poor telecommunication infrastructure	Iddris (2012), Asria and Venkati (2012), Almousa (2013), Nanehkaran. (2013), Hassen and Svensson (2014)
8.	Lack of awareness of e-commerce benefits	Zaied (2012), Iddris (2012), Asrie and Venkat (2012),Nanehkaran. (2013)
9.	Lack of qualified staff	Vijay and Asefa (2011), Asrie and Venkati (2012)
10.	Lack of Internet security	Iddris (2012), Almousa (2013), Kanyaru and Kyalo (2020)
11.	Lack of pressure from suppliers and customers	Zaied (2012), Almousa (2013), Adewale, Ayo-Oyebiyi, and Adebayo (2013). El-fitouri (2020)

12.	Lack of management support	Zaied (2012), Iddris (2012)
13.	Lack of technical know how	Abbad, Abbad, and Saleh (2011), Zaied (2012), Iddris (2012), Hassen and Svensson (2014)
14.	Lack of financial resources	Zaied (2012), Mohammed, Almsafir, and Alnaser (2013), Hassen and Svensson (2014)
15.	Lack of popularity for online marketing	Kapurubandara (2009), Lawrence and Tar (2010)
16.	Lack of secure payment infrastructures	Asrie and Venkati (2012), Nanehkaran (2013), Hassen and Svensson (2014), El-fitouri (2020)
17.	No simple procedures and guidelines	Zaied (2012), El-fitouri (2020)
18.	High financial risk	Iddris (2012), Razavi, Hosseini and Razavi (2014)
19.	Frequent power disruption	Asrie and Venkati (2012), Biruk, Yilma, Andualem, and Tilahun (2014)
20.	Lack of adequate budget	Kuzic, Fisher and Scollary (2002), Asrie and Venkati (2012), Nanehkaran (2013)

2.3. Barriers of e-commerce in Africa

Zaied (2012) has conducted a study on barriers of adopting e-commerce adoption in Egypt. As per their study, many factors were found responsible for the barriers of e-commerce adoption in Egypt. The finding in the study claimed that technical barriers were the most important barriers followed by legal and regulatory barriers.

Zaied, (2012) has identified 26 barriers and organized in to six parts as shown in (Figure.1) below. In the model, the first part focused on barriers related to socio-cultural factors, the second part is about technical factors, the third part is about economic factors, the fourth part focus on political factors, the fifth part is about organizational factors and the last part is about legal and regulatoryfactors.

Figure 1 . Barriers of e-commerce Adoption

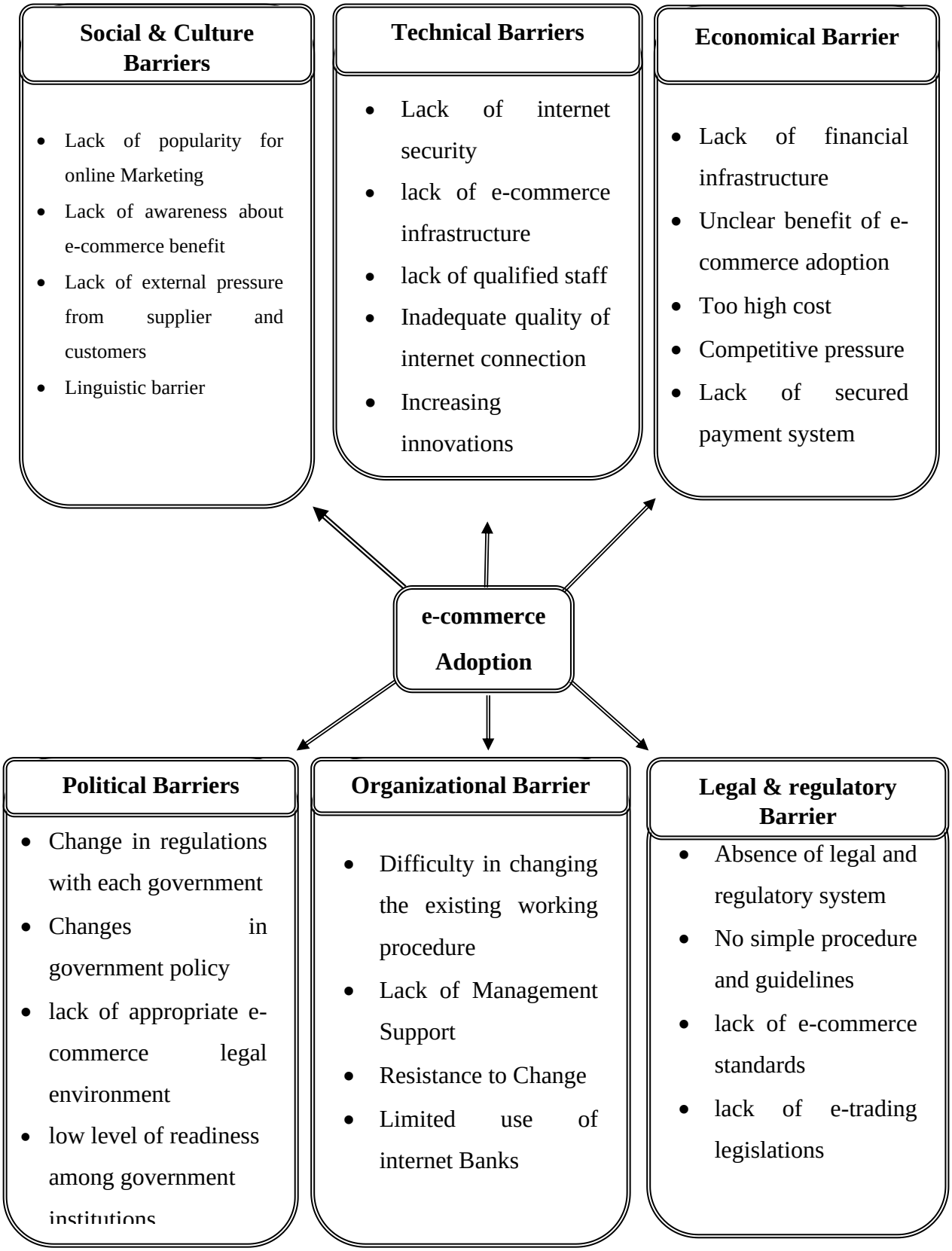


Figure 4.9. Conceptual framework for e-commerce adoption barriers by Zaied, (2012)

III. Research Methodology

The main objective of the study is to identify the most important barriers facing the adoption of e-commerce and to discover the relationship between the barriers affecting the adoption of e-commerce and the level of e-commerce adoption. In order to achieve the intended objectives, the questionnaire was designed as per the identified barriers in conceptual framework. Marketing experts have checked the validity of the questionnaire and pilot study was also conducted for the design of final data collection instrument. Self-administered questionnaire was distributed to selected company managers. The participants were asked to rate their perception towards the barrier that affects e-commerce adoption within their enterprises on a five-point Likert-type scale with anchors from "strongly agree", "agree", "neutral", "disagree", and "strongly disagree" assigning values '5', '4', '3', '2', and '1' respectively.

Simple random sampling techniques was employed to select 410 samples fromthe total population of 3150 large and medium scale manufacturing industries found in Ethiopia. The sample size is representative according to Yamane (1967). In this research, a total of 410 questions were distributes and only 330 questionnaires were returned on time and properly filled. The response rate was 80.5 percent which is acceptable as per Baruch (1999).

IV. Results and Discussion

4.1. Reliability and Validity Test

Reliability and Validity are two basic elements in evaluating a measurement instrument. Validity is concerned with the extent in which the instrument measures what it is intended to measure, while reliability is concerned with the ability of an instrument to measure consistently. As a result, a reliability check was computed and the following Cronbach's Alpha value were obtained.

Table (5) Summary of barriers of e-commerce adoption reliability test

S. No	Item	Cronbach's Alpha value	Number of items
1.	Social & Cultural Barriers	**0.884**	4
2.	Technical Barriers	**0.859**	5
3.	Economical Barriers	**0.788**	5
4.	Political Barriers	**0.801**	4
5.	Organizational Barriers	**0.824**	4
6.	Legal & regulatory Barriers	**0.914**	4
7.	**Total items**	**0.930**	26

Source: Own Survey, 2020

As cited in Streiner (2003), has mentioned alpha value of 0.70 - 0.95 has been acceptable and recommended. As a result, since the Cronbach's Alpha value of the instruments used in this study to identify the barriers of adopting e-commerce is 0.79 - 0.93, the instruments used were able to measure barriers consistently.

The other important element regarding the instrument is validity test. In order to have valid instrument, the researcher has adopted the items which were developed by Zaied (2012) and used by Savrul, Incekara, andSener (2014). Therefore, the instrument was found both reliable and valid.

4.2. Barriers of e-commerce adoption in Ethiopia

For the purpose of identifying the barriers of adopting e-commerce, arithmetic average, standard deviation, and relative agreement of the study samples were used. Table (6) shows the results on barriers of in e-commerce adoption by Ethiopian large and medium scale manufacturing companies.

In order to rank the barriers as the level of agreement the researcher has categorized the result in to three. The top barriers which have a mean value of 3.67 (73.5% relative importance) and above were marked as "***", the barriers which have a mean value of 3.5 - 3.67 (70-73.5% relative importance) were marked as "**", and the barriers which have a mean value of less than 3.5 (<70% relative importance) were marked as "*".

Table (6) Mean, standard deviation, relative importance and ranking on e-commerce barriers

Rank	Barriers	Mean	Relative importance	Ranking	Remark
1	lack of financial infrastructure	3.8212	76.42%	1	***
2	lack of e-trading legislations	3.8121	76.24%	2	***
3	Inadequate quality of internet connection	3.8	76%	3	***
4	low level of readiness among government institutions	3.7121	74.24%	4	***
5	lack of e-commerce standards	3.7091	74.18%	5	***
6	Lack of external pressure from supplier and customers	3.7061	74.12%	6	***
7	Unclear benefit of e-commerce adoption	3.6818	73.64%	7	***
8	Limited use of internet Banks	3.6818	73.64%	8	***
9	Lack of Competitive pressure	3.6758	73.52%	9	***
10	No simple procedure and guidelines	3.6758	73.52%	10	***
11	lack of e-commerce infrastructure	3.6697	73.39%	11	**
12	lack of appropriate e-commerce legal environment	3.6485	72.97%	12	**
13	Lack of popularity for online Marketing	3.6424	72.85%	13	**
14	lack of qualified staff	3.6424	72.85%	14	**
15	Lack of awareness about e-commerce benefit	3.6364	72.73%	15	**
16	Lack of secured payment system	3.6212	72.42%	16	**
17	Absence of legal and regulatory system	3.5758	71.52%	17	**
18	Lack of internet security	3.5333	70.67%	18	**
19	Difficulty in changing the existing work procedure	3.5333	69.67%	19	**
20	linguistic barrier	3.4727	69.46%	20	*
21	Too high cost	3.3485	66.97%	21	*
22	Lack of Management Support	3.3333	66.67%	22	*
23	Change in regulations with each government	3.3152	66.3%	23	*
24	Changes in government policy	3.2515	65.03%	24	*

25	Increasing innovations and new technologies	3.2	64%	25	*
26	Resistance to Change	3.1212	62.42%	26	*

Source: Own Survey, 2020

Table (7) Compiled Mean, rank and relative agreement on barriers of e-commerce adoption

S. No	Item	Number of items	Mean	Relative agreement	Rank	Remark
1.	Legal & Regulatory Barriers	4	**3.7**	74%	1	***
2.	Economical Barriers	5	**3.63**	72.6%	2	**
3.	Social & Cultural Barriers	4	**3.61**	72.2%	3	**
4.	Technical Barriers	5	**3.57**	71.4%	4	**
5.	Political Barriers	4	**3.41**	68.2%	5	*
6.	Organizational Barriers	4	**3.41**	68.2%	6	*

Source: Own Survey, 2020

Through previous results, it can be noted that the result is logical, because the success of e-commerce cannot be achieved with the absence of laws and regulations governing e-commerce. In addition to that, the success of e-commerce cannot be achieved by the lack of economic advantage and with the weakness regarding the social and cultural barriers in large and medium Scale manufacturing industries in Ethiopia. Besides, the technological, political and organizational are hindering factors to deal with e-commerce adoption.

As shown above in the finding of the study, from the top ten barriers ranked above most of the factors are related with infrastructural (poor online financial infrastructure, interrupted internet connection), legal issue (lack of e-trading legislation, e-commerce standard and guidelines), and external environmental factors (low level of readiness among government institutions, suppliers, competitors and customers) barriers and insufficient awareness about the benefit of e-commerce. These results are consistent with several previous studies, where the study conducted by Love, Irani, Cheng, and Tse (2001), Laurance and Usman (2010), Zaied (2012), Savrul, Incekara, and Sener (2014), and El-fitouri(2020) in most of the developing countries, the infrastructure, laws, and legislation, and external environmental factors were the main factors hindering the growth and success of e-commerce adoption.

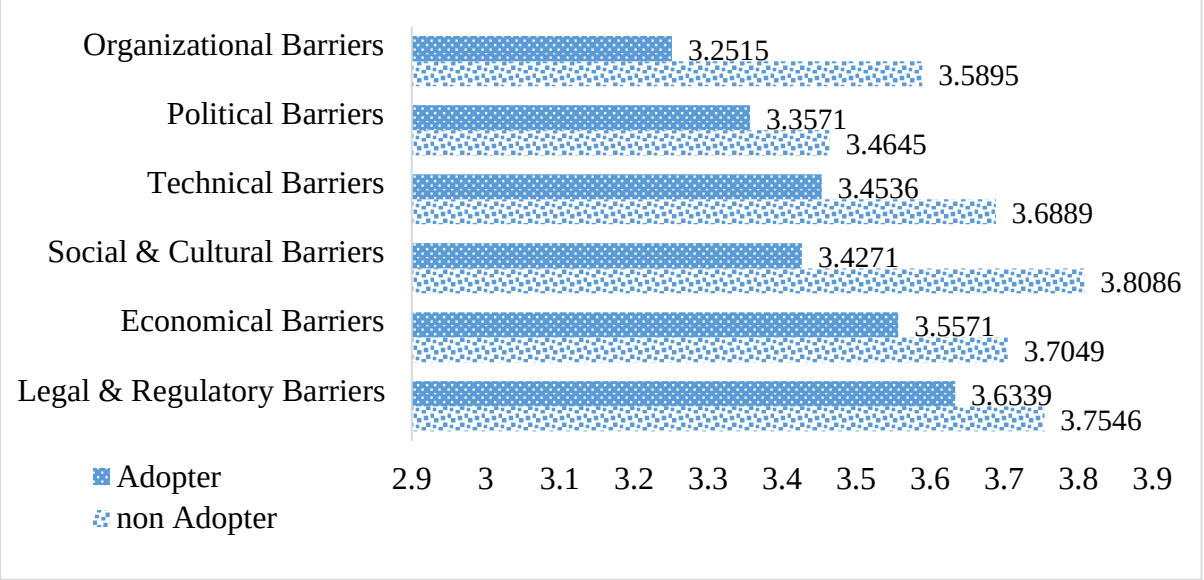
4.3. Barriers among Adopters and Non adopters

The other area the researcher has investigated was either the barriers have relation with the level of adoption or not. As a result, the researcher has computed the average and standard deviation of the adopters and non-adopters and examine an independent t-test to know either the barriers have significant difference between the adopters and non-adopters. As Qirim (2007), the level of e-commerce is categorized in to four. In which the first category is "Non adopters" which are not connected to internet at all. The second category is "Starter" which are adopters of internet and e-mail. The third category is "Adopter" which are adopters of any Electronic Data Interchange (EDI), and website. The fourth category is "Extended Adopters" are adopters of any of the electronic commerce information technology. As a result, the data was splited in to two section. The "Non adopters" section combines non adopters and starters and "Adopters" incorporated those adapters and extended adopters.

The assumptions of an independent t-test like the assumption of independence were done carefully by selecting samples and administering respondents, test of normality by using Kim, (2013) criteria, test of homogeneity of variance using Levene's test for equality of variancewere checked and the result of an independent on one tailed t-test in which the null hypothesis that stated the barrier mean for adopter is more than non-adopter. And the finding of the research has shown below in table (9).

Table: (9) Independent Samples t test result

S. NO	E-commerce Adoption Barriers	Independent Samples Test result			
		Mean Difference	t	Df	Sig. (1-tailed)
1.	Legal & Regulatory Barriers	0.12070	1.184	328	0.1185
2.	Economical Barriers	0.14780	1.607	328	0.0445
3.	Social & Cultural Barriers	0.381559	3.237	325.04	0.0005
4.	Technical Barriers	0.23532	2.300	304.8	0.011
5.	Political Barriers	0.10736	1.056	328	0.146
6.	Organizational Barriers	0.33802	3.139	310.64	0.001



As it has shown above in table and figure: results showed that Legal & Regulatory related barriers are affecting more non-adopters with scores (M=3.75, SD=0.91) than adopters (M=3.63, SD=0.93) and it was found to be insignificant at t_{328} = 1.184, $p < 0.05$. In addition, results showed that economical barriers are affecting more non-adopters with scores (M=3.70, SD=0.83) than adopters (M=3.55, SD=0.83) and it was found to be significant at t_{328} = 1.607, $p < 0.05$. Results also showed that social & cultural barriers are affecting more non-adopters with scores (M=3.80, SD=0.99) than adopters (M=3.42, SD=1.14) and it was found to be significant at $t_{325.04}$ = 3.23, $p < 0.05$. Moreover, technical barriers are affecting more non-adopters with scores (M=3.68, SD=0.77) than adopters (M=3.45, SD=1.06) and it was found to be significant at $t_{304.08}$ = 2.3, $p < 0.05$. The political barriers are affecting more non-adopters with scores (M=3.46, SD=0.9) than adopters (M=3.35, SD=0.93) and it was found to be insignificant at t_{328} = 1.05, $p < 0.05$.

Finally, the organization related barriers are affecting more non-adopters with scores (M=3.58, SD=0.83) than adopters (M=3.25, SD=1.10) and it was found to be significant at $t_{310.64}$= 3.139, p <

0.05.From the above finding it is claimed that the Economic, Social, Technical and organizational barriers affects the non-adopters mora than adopters. And the legal & regulatory and political barriers affects both because the finding which stated the barriers more affect non-adopter than adopters was found insignificant.

V. Conclusion

From the finding of the study, the most important top ten barriers are the factors related with infrastructural (poor online financial infrastructure, interrupted internet connection), legal issue (lack of e-trading legislation, e-commerce standard and guidelines), and external environmental factors (low level of readiness among government institutions, suppliers, competitors and customers) barriers and insufficient awareness about the benefit of e-commerce. In addition, the researcher claimed that the Economic, Social, Technical and organizational barriers affects the non-adopters mora than adopters. And the legal & regulatory and political barriers affects both because the finding which stated the barriers more affect non-adopter than adopters was found insignificant.

VI. Research Recommendations

Based on the research result, the following recommendations were forwarded for the successful adoption of e-commerce in large and medium Scale manufacturing industries in Ethiopia.

The Ethiopian Government

- Develop the legal infrastructure such as e-commerce law, e-signature and e-payment laws, electronic security and safety systems.
- Focus on improving technical infrastructure necessary for the operation of e-commerce and internal systems support e-commerce.
- Encourage and stimulate the banking sector to enter the field of e-banking and credit card service to facilitate electronic payment.

Organizations that rely on e-marketing in Ethiopia

- Take into consideration the social customs and traditions for the consumer, when the target community.
- Create a climate that aims to disseminate the concept, importance, and advantages of e-commerce, and increasing the consumer confidence.

Non adopting companies in Ethiopia

- Develop electronic infrastructures and technological advancement as ameans of communicating electronically.
- Communicateusing the web and work more to reduce the cost for enterprises.

VII. Limitation of the study

It should be noted that this study has several limitations. The data for the study were collected from manufacturing industry sectors, and it is not possible to make general conclusions. Also, this is a quantitative study and further qualitative research is required to gain a better understanding of the key issues of e-commerce adoption.

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