

# Implementation of Accounting Information Systems in Ethiopia: Evidence from Small and Medium Enterprises in Bahir Dar City

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**Abstract:** Understanding the interplay between information technology implementation and productivity growth is the foundation for projecting the future economic growth rate of developing countries in general and the development of Small and Medium enterprises (SMEs) in particular. The study explores factors affecting implementation of Accounting Information Systems (AISs) among SMEs in Ethiopia taking SMEs in Bahir Dar City as a reference. In doing so, mixed research approach was found to be appropriate in this study. Besides, in order to collect data, self-administered structured questionnaire and in-depth interview tools were utilized. The statistical societies of the study were included using random sampling technique with cross-sectional survey design. Collected data were analyzed using SPSS software version 22 and descriptive statistics and regression analysis were made to find answers for pre-determined hypotheses. Given the dichotomous response to the dependent variable (AISs implementation), binary logistic regression model was used aimed to identify major influential factors. The result of the study found that implementation of AISs is at its lowest level among SMEs in Ethiopia and factors such as government support, employees' IT competence, complexity of AISs, organizational readiness, and owner (manager) support were found to be significantly influencing AISs implementation in Ethiopia. The study helps concerned stakeholders to understand determinants of AIS technologies implementation among SMEs in Ethiopia and thereby helps to design appropriate policies that would modernize and automate their accounting systems and practices. This study also contributes to AIS literature on determinants of AISs implementation among SMEs in developing countries.

**Keywords:** Accounting Information Systems, Implementation, Small and Medium Enterprises, Ethiopia

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## 1. Introduction

In contrary to its ancient and glorious history, Ethiopia is still one of the poorest countries in the world. As a result, with the intention of reducing the prevailing poverty, the government of Ethiopia has initiated and implemented a national small and medium enterprises development strategy, which is highly believed to expand and promote the sector. Literatures well acknowledged that small and medium enterprises (SMEs) have played and continue to play indispensable roles in economic growth, development and industrialization of developing countries through creating mass job opportunities for the low-income sections of the society; increasing exports and hence generating foreign currencies; introducing innovations in science and technology

spheres; and creating favorable conditions for entrepreneurship skills which could, in turn, reduce countries dependency on foreign aids and borrowings.

According to United Nations Industrial Development report it was estimated that SMEs sector represents over 90% of private businesses and creates more than 60% employment opportunities for young population and of gross domestic product (GDP) of most African countries, including Ethiopia [1]. As far as SMEs in Ethiopia is concerned, it was documented that about 800,000 SMEs are found across the country and more than 2.4 million labor forces are engaged in the sector [2]. As a result, SMEs sector development and expansion has been and is high on the agenda of the Ethiopian government as a means to reduce poverty and generate mass employment opportunities for the growing

young population in the country.

In the global business environment, technology is one of the salient elements for remaining competitive [3]. SMEs inevitably has been influenced by re-definition of competitiveness and evolved to keep abreast of the latest market demands and arisen information technologies. Due to the significant association of globalization with SMEs sector now and ahead, the implementation of Accounting Information system technologies (AISs) could help to manage and control of SME's financial and non-financial economic activities. Besides, the stunning advance in technology has opened up the possibility of generating and using accounting information from a strategic viewpoint aimed to succeed in the global market [4].

Accounting systems, with their dual output of financial reports for external use and control reports for internal management, are an integral and important part of a society's information system [5]. Due to the existence of new, modern and multi-variant purpose innovations in ICT, the manual accounting system becomes obsolete and unable to process accounting tasks more efficiently than ever before. To this end, accounting tasks which were done manually are now performed through utilizing advanced information system technologies [6]. Accounting information systems combine the methodologies, controls and accounting techniques with the technology of the IT industry to track transactions that affect organizational success and failure [7]. Consequently, SMEs in both developed and emerging countries have implement AIS technologies with the intension of increasing their competitiveness [4]. Understanding the interplay between information technology implementation and productivity growth is the foundation for projecting the future economic growth rate of developing countries in general and the growth of SMEs in particular. However, a study of Abate [8] pointed out that business firms in Ethiopia lags behind fellow African countries in terms AISs adoption and implementation and thereby characterized by poor accounting practices; incompatibility of their financial statements with International Accounting Standards (IASs); and limited access to finance due to poor financial statement preparation and presentation. SMEs sector in Ethiopia is not exception in this context. Despite the increasing government support and the importance of SMEs sector to Ethiopia's economy, most of them still remain backward and underperforming in terms of profitability and growth partly due to poor accounting records and practices.

However, empirical researches on implementation of AISs in developing countries, including Ethiopia are scanty, and to the best understandings of the researcher, there has not been any empirical evidence in Ethiopia on the issue under study. Therefore, examining factors influencing AISs implementation among SMEs is of paramount importance to automate the accounting systems of SMEs sector in particular and to bridge the literature gaps that exist in Ethiopia on the issue in general.

#### *Objectives of the Study*

##### *General Objectives*

The general objective of the study is to examine factors that affect the implementation of AISs in Small and Medium Enterprises (SMEs) in Ethiopia.

##### *Specific Objectives*

- I. To assess the extent of accounting information systems implementation among SMEs in Ethiopia
- II. To determine the driving factors that lead to AISs implementation among SMEs in Ethiopia
- III. To identify the major impediments for implementation of accounting information systems among SMEs in Ethiopia

## **2. Review of Related Literatures**

### ***2.1. Empirical Evidence of Determinants of Accounting Information Systems Implementation***

A study conducted by Alamin et al. [9] found out that performance expectancy, effort expectancy, perceived technology fit, facilitating conditions, self-efficiency and coercive pressure are the powerful determinants to influence the likelihood that accountants would adopt AIS technologies for accomplishing their professional accounting tasks. On the other hand, a study of Lutfi et al. [10] regarding the influence of technological, organizational and environmental factors on accounting information systems usage in Jordan findings revealed that compatibility, management commitment, organizational readiness, competitive pressure, and government support were the determinant factors that affect AISs implementation.

Nyang'au et al. [11] found out that the level of computerized accounting systems adoption is low in coffee societies. In addition, cost, human resource proficiency and availability of related infrastructures are the most important constraints affecting implementation of computerized accounting information systems in Kenya. In a similar study, Sam et al. [12] findings regarding adoption of computerized accounting systems in Malaysia revealed that adoption of AISs is mainly caused by its usefulness. A study of Ngadiman et al. [13] findings revealed that perceived ease of use and perceived usefulness were the driving forces that encourage Syrian micro finance institutions to adopt and utilize AISs. In addition, performance risk, financial risk and system security risks were the main factors that hamper micro finance institutions not to adopt AIS technologies for their business operation. Similarly, a study revealed that there was a strong correlation between organizational factors, social factors and TAM variables in affecting the intention to adopt AISs [14]. Ndkewa [6] study findings showed that security, relative advantage, compatibility, Trading partners and computer facilities were found to be significantly associated with computerized accounting information systems adoption among adopter and non adopter whereas complexity, owners/manager enforcement authority, organization readiness and employee competency were found to be non significantly associated with adopter and non adopter of computerizing accounting systems. In the same token, Rosli et al. [15] findings revealed that compatibility,

complexity, organizational readiness, employees IT competence, firm size, competitive pressure, and Vendors' and professional accounting bodies' support has a significant influence on audit technology adoption among audit firms. However, Muhrtala and Ogundeji [16] found out that operational, commercial, strategic, and technical and security considerations are the primary determinants of accounting software deployment/implementation decision.

## 2.2. Summary and Gaps in the Existing Literatures

In order to understand the relationship between accounting information technology implementation and factors that affect the likelihood of its adoption among SMEs sector, different variables such as technological attributes, internal characteristics of firms, and external environment of the firm were examined. To this end, Technology-Organization-Environment (TOE) and Roger's Diffusion of innovation (DOI) frameworks were utilized as a theoretical background to understand and examine the major determinant variables that affect AISs implementation among SMEs sector in Ethiopia.

However, there are fewer researches conducted to investigate organizational level factors of AISs implementation through integrating TOE and DOI frameworks as a theoretical background. Furthermore, most of the empirical studies regarding factors influencing AISs implementation were based on data obtained from developed and emerging economies, not from sub-Saharan countries which have created a huge literature gap in sub-Saharan countries, including Ethiopia.

## 2.3. Hypotheses of the Study

Hypotheses of the study are developed based on theories and empirical evidences related to factors affecting accounting information systems (AISs) adoption. Hence, this study seeks to test the following hypotheses:

### *Relative advantage of AISs*

Relative advantage is defined as the degree to which an innovation is perceived as being better than the idea it supersedes [17]. The theory of DOI suggests that the relative advantage of an innovation is positively influences the behavior of potential adopters to adopt the technology. Various accounting information systems researchers found that relative advantage has a positive relationship with AISs implementation decisions such as [6, 15, 18].

*H<sub>1</sub>: Relative advantage of accounting information system technologies strongly influences the likelihood of accounting information systems implementation among SMEs in Ethiopia.*

### *Complexity of AISs*

Complexity of AIS technologies is one of the major barriers for the implementation of AISs. Edison et al. [18] study on factors affecting AISs adoption found that complexity has a negative relationship with AISs implementation. Similarly, Venkatesh et al. [18] found that complexity attribute of information technology has an influence on the decision to adopt AIS technologies.

Complexity is widely understood as the major barrier to the adoption and utilization of an innovation [19]. According to theories, if the intended innovation perceived to be complex, the likelihood of implementing that innovation is less likely.

*H<sub>2</sub>: Complexity of accounting information system technologies strongly influences the likelihood of accounting information systems implementation among SMEs in Ethiopia.*

### *Compatibility of AISs*

Compatibility is another technological attribute perceived by organizations which was suggested by Diffusion of innovation (DOI) as drivers of the decision to adopt new technologies. Many researchers such as [10] and [6] found a positive relationship between AIS technology compatibility and the likelihood of AIS technology implementation at firm level.

*H<sub>3</sub>: Compatibility of accounting information system technologies strongly influences the likelihood of accounting information systems implementation among SMEs in Ethiopia.*

### *Owner (manager) support*

One of the organizational factors that affect the likelihood of AISs adoption is owner (manager) commitment and support. Many information technology researchers [20-22] found that there is a positive relationship between technology implementation and owner (manager) support.

*H<sub>4</sub>: Owner (manager) support strongly influences the likelihood of accounting information systems implementation among SMEs in Ethiopia.*

### *Organizational readiness*

Rosli et al. [15] study regarding factors affecting audit technology adoption among audit firms found that organizational readiness in terms financial and technological resources has a positive relationship with adoption of audit technologies in Barbados. In the same token, Lutfi et al. [10] found that organizational readiness significantly influences AISs adoption.

*H<sub>5</sub>: Organizational readiness strongly influences the likelihood of accounting information systems implementation among SMEs in Ethiopia.*

### *Employees' IT competence*

The human resources who intended to run and manage the adopted computer-based AIS should have the necessary knowledge and skills to run the technology in most efficient way. Past studies have shown that the extent of employees' IT competence tends to favor the acceptance and adoption of technological innovations. This assertion has much empirical support such as [19, 23].

*H<sub>6</sub>: Employees' IT competence strongly influences adoption of accounting information System technologies implementation among SMEs in Ethiopia.*

### *Competitive pressure*

Different literatures assumed that the existence of competition and high rivalry among business organizations tends to increase the likelihood of innovation adoption for the purpose of gaining competitive advantage in the market. Hence, the more an organization adopts and utilizes AISs, the better the company will be competent and beat market

competitors. This assertion is supported by many empirical evidences [22, 21] & [24].

*H<sub>7</sub>: Competitive pressure strongly influences implementation of accounting information System technologies among SMEs in Ethiopia.*

*Government support*

Government support to the manufacturing sector could be expressed in terms of drafting policy frameworks that favor

AISs adoption. The more the government provides support for the SMEs sector; the better will be the adoption of AIS technologies. This assertion has some empirical evidence such as [24] and [10].

*H<sub>8</sub>: Government support strongly influences implementation of accounting information System technologies among SMEs in Ethiopia.*

*Conceptual Framework of the study*

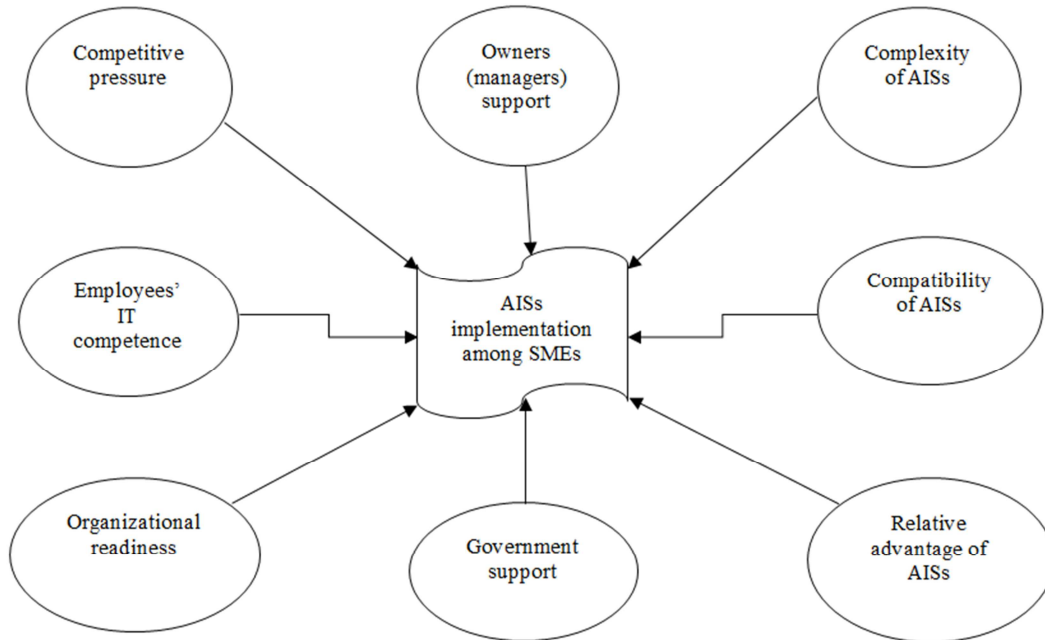


Figure 1. Own constructed conceptual framework.

### 3. Methodology: Research Process and Design

#### 3.1. Sampling Design and Sample Size

The total sample size in this study was determined using the commonly used rule of thumb technique suggested by Green [25]. This rule of thumb states that the minimum sizes of samples for conducting a study which has regression analysis is expressed as  $N \geq 50 + 8m$

Where,

N = minimum number of Small and Medium enterprises (SMEs)

m = the number of explanatory (independent) variables

The national Micro, Small and Medium Enterprises development strategy [26] and Development Bank of Ethiopia define SMEs based on the number of employees and net worth. Accordingly, the following table shows the definition of SMEs in Ethiopia:

Table 1. Definition of SMEs in Ethiopia.

Economic sector	Small enterprises		Medium enterprises	
	Service	Industry	Service	Industry
Employees	6 – 30	6 – 30	31 - 100	31 - 100
Capital	50,001-500,000 Birr Or EUR 2,001 - 20,000	100,001–1,500,000 Birr Or EUR 4,001 - 60,000	500,001 - 7,500,000 Birr Or EUR 20,001 -300,000	

Hence, a total of 200 SMEs, which fulfill the above definition, were selected in Bahirdar city administration to complete the questionnaires based on random sampling technique.

#### 3.2. Data Source and Method of Data Collection

Primary data were collected using structured questionnaires from SMEs located at Bahirdar city

administration. However, additional information was collected using key informant interview with five (5) information technology experts, which were selected using judgmental sampling. The primary data which is mainly used in descriptive and empirical analysis of the study were collected using structured questionnaires from sampled SMEs found in Bahirdar city. The data collected using questionnaire consists of demographic information, extent of AISs implementation among SMEs, factors that influence

SMEs decision to implement AIS technologies. All questions related to determinants of AISs implementation were rated using a five point likert scaling in which 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree.

**3.3. Method of Data Analysis**

Data analysis is the application of reasoning to understand the data that have been gathered. The survey data were analyzed using descriptive statistics and econometric model. Further, so as to establish whether there exist a direct relationship between factors affecting AISs implementation in SMEs and the dependent variable proposed in the study, binary logistic regression model was utilized. The dependant variable (i.e. AISs implementation) is a dummy variable which is coded as 1 = Implementer, 0 = non-implementer. Similar data analysis technique was utilized by Abate [8]. In due process, Statistical Package for Social Science (SPSS) version 22 was used. In addition, for triangulation purpose, the non-quantifiable data were categorized in themes along with quantitative data analysis in accordance with the research hypotheses.

**3.4. Model Specification and Regression Analysis**

The ordered probit and logit models have been widely used in information technology implementation researches as a frame-work for analyzing such responses. However, for the sake of statistical and simplicity purpose, binary logistic regression model was utilized in this study to investigate the relationships between independent variables and

$$P(Y) = \ln\left(\frac{P}{1-P}\right) = \beta_0 + \beta_1C + \beta_2RA + \beta_3CP + \beta_4OR + \beta_5EIC + \beta_6GS + \beta_7CP + \beta_8OMS + \epsilon_i$$

Where:

- P = the probability of implementing AIS technologies
- Y=Accounting information systems implementation (1 if AISs is implemented, 0 otherwise)
- B0 = Constant of the binary logistic regression equation
- C= Complexity of AISs
- RA = Relative advantage of AISs
- CP = Compatibility of AISs
- OR= Organizational readiness
- EIC = Employees’ IT competence
- GS = Government support
- CP = Competitive pressure of SMEs

implementation of AISs. Binary logistic regression is mostly used to predict a categorical (dichotomous) dependent variable from a set of either continuous or categorical predictors. Since the dependant variable is dichotomous (i.e. SMEs are either AISs implementer/non-implementer) the model is presented as follows:

$P(Y) = \log \frac{P}{1-P} = \beta_0 + \beta_1X_1 + \beta_2X_2 + \dots + \beta_iX_i + \epsilon_i$  and this results in:

$$P(Y) = \frac{e^{\beta_0 + \beta_1X_1 + \beta_2X_2 + \dots + \beta_nX_n + \epsilon_i}}{1 + e^{\beta_0 + \beta_1X_1 + \beta_2X_2 + \dots + \beta_nX_n + \epsilon_i}}$$

- Where: P = the probability of the occurrence of success
- Y = binary response dependent variable
- X<sub>i</sub> = Explanatory/independent variables
- e = Natural logarithm base
- β<sub>0</sub> = Interception at Y – axis
- β<sub>i</sub>= coefficients of the explanatory variables
- ε<sub>i</sub> = stochastic disturbance or error term

In the above logistic model, the relationship between P(Y) and X is non-linear. According to Field [27] when the outcome (dependant) variable is categorical, the linearity assumption is violated; both Gujarati [28] and Field [27] recommended that one way of solving the linearity problem in logistic regression is to transform the data using the logarithmic transformation. This transformation is termed as the logit transformation of the probability of Y and the ratio is called the oddsratio. Therefore, for this study, the binomial logistic regression model is written in linear form as:

- OMS = Owners (mangers) support
- ε<sub>i</sub> = Classical Random error term

**3.5. Reliability and Validity of the Questionnaire Constructs**

**3.5.1. Reliability Test**

The structured questionnaire used in this was assessed for reliability using Cronbach alpha value. Many research scholars argued that a Cronbach’s alpha value of 0.7 indicates a reliable instrument. Accordingly, using SPSS software version 22, all constructed were above 0.7 limits.

*Table 2. Cronbach alpha coefficient of constructs.*

Variables	No of items	Cronbach’s alpha value	Degree of reliability
Owner (manager) support	4	0.785	High reliability
Organizational readiness	4	0.818	High reliability
Government support	4	0.910	Excellent reliability
Employees’ IT competence	4	0.733	High reliability
Competitive pressure	4	0.899	High reliability
Compatibility of AIS	3	0.888	High reliability
Complexity of AIS	4	0.825	High reliability
Relative advantage of AIS	4	0.874	High reliability

Source: SPSS output (2018).

**3.5.2. Validity of the Instrument**

To check for comprehensibility and suitability of the questionnaire used in this study, a pilot test was conducted with 20 randomly chosen SMEs in Bahirdar city. During the pre-test, the suitability of the questionnaire was confirmed. Besides, the questionnaire was assessed by four information system experts who are currently working in Bahirdar University.

**4.1. Respondents and SMEs Characteristics**

*Table 3. Demographic information of respondents and SMEs.*

Variables	Item	Frequency	Percentage
Gender	Male	97	71.3
	Female	39	28.7
	None	17	12.5
Level of education	Primary education	28	20.59
	Secondary education	57	41.91
	Collage education	34	25.0
Types of SMEs	Manufacturing	27	19.85
	Merchandizing	34	25.0
	Service-giving	75	55.15
Age of SMEs	Less than 5 years	22	16.18
	5 – 10 years	67	49.26
	Above 10 years	47	34.56
Degree of AISs implementation	AISs implementer	34	25.0
	Non-implementer	102	75.0

Source: SPSS output (2018).

The above table presents demographic characteristics of respondents and SMEs. The gender distribution of respondents was unequal with majority (71.3%) of them are males, while females have a share of 28.7%. This might be due to the literacy differences and other socio-cultural influences that hinder females from engaging in a profession such as business manager. Regarding level of education, most (41.91%) of them achieved secondary education, followed by collage education (25%) achievers. As far as the type of SMEs is concerned, majority (55.15%) of SMEs are service-giving businesses, followed by merchandising and manufacturing enterprises with a percentage of 25 & 19.85 respectively. This could be due to the under development of the manufacturing sector in Ethiopia. Age of SMEs was included in the questionnaire with the intention of capturing the number of years they have been in the business. Accordingly, Most (67%) of SMEs have been in the business between 5 – 10 years and the rest have been below 5 years and above 10 years with the share 16.18% & 34.56% respectively. Finally, SMEs businesses that have implemented AISs in Bahirdar city were 25%, while non-implementers of AISs were 75%. This result clearly indicated that AISs implementation among SMEs in Ethiopia is quite low compared with other developing countries.

**4.2. Binary Logistic Regression Analysis and Discussion**

**4.2.1. Goodness -of -Fit Test of the Binary Logistic Regression Model**

In this sub-section, goodness of fit of the binary logistic

**4. Findings and Discussions**

Out of the 200 questionnaires distributed to SMEs found in Bahirdar city administration, only 136 of them were appropriately returned and filled, which represents about 68% response rate. Therefore, the analysis and discussions are based on 136 questionnaires returned.

regression model with the data and associated assumptions were examined and checked before the actual regression analysis.

*Table 4. Omnibus Tests of Model Coefficients.*

		Chi-square	Df	Sig.
Step 1	Step	129.097	8	.000
	Block	129.097	8	.000
	Model	129.097	8	.000

Regarding goodness of fit of the overall model, this study utilized omnibus test of model coefficients. As we can see from the above table the Omnibus test of model coefficients shows a Chi-Square of 129.097, which is also significant (P-value < 0.0005). Since the omnibus test is significant, it can be concluded that adding predictor variables to the model has significantly increased our ability to predict AISs implementation among SMEs in Ethiopia.

*Table 5. Model Summary.*

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	50.849 <sup>a</sup>	.613	.835

a. Estimation terminated at iteration number 8 because parameter estimates changed by less than .001.

The most common assessment of overall goodness-of-fit of the binary logistic regression model is the chi-square difference between the null model and the model containing predictors. In the above table we can see that the -2 log

likelihood statistics is 50.849 and this statistics is an indicator of how much unexplained information there is after the model has been fitted. Even though SPSS does not prove us the statistics for the model that had only the intercept, we know it to be 179.946 (50.849 + 129.097). This implies that adding of predictor variables in this study improved the predictive power of the binary logistics model. The result of Cox and Snell R<sup>2</sup> and Nagelkerke R<sup>2</sup> in the above table is 0.613& 0.835 respectively. Hence, the Nagelkerke R<sup>2</sup> of 0.835 implies that 83.5% of the variance in the dependant variable (i.e. the likelihood AISs implementation) is explained by the predictor variables included in this study.

**4.2.2. Binary Logistic Regression Result and Discussion**

*Table 6. Hosmer and Lemeshow Test.*

Step	Chi-square	Df	Sig.
1	5.981	8	.649

The other method of overall goodness of fit assessment of the logistic regression is Hosmer-Lemeshow test, which measures the correspondence of the actual and predicted values of the dependant variable. As can be observed from Table 6, the significant values is greater than 0.05 (0.649> 0.05). Hair et al. [29] argued that if the significant value in Hosmer-Lemeshow test is greater than 0.05, then the model we used is feasible to be used for further analysis.

*Table 7. Variables in the Equation.*

Step 1 <sup>a</sup> variables	B	S. E	Wald	Df	Sig	Exp(B)
Complexity of AISs	-1.771	.752	5.540	1	.019	.170
Compatibility	-.412	.372	1.229	1	.268	.662
Owner (manager) support	2.926	.732	15.968	1	.000	.054
Competitive pressure	.552	.837	.435	1	.510	.576
Employees' IT competence	.677	.310	4.762	1	.029	.508
Relative advantage	.074	.310	.058	1	.810	.928
Organizational readiness	1.142	.396	8.321	1	.004	3.133
Government support	.991	.427	5.386	1	.020	2.693
Constant	9.348	3.176	8.665	1	.003	11474.173

Variable(s) entered on step 1: Complexity of AISs, compatibility, Owner (manager) support, Competitive pressure, employees' IT competence, Relative advantage, Organizational readiness, Government support.

The results presented in the above table shows that all independent variables have significant statistical relationship with AISs implementation among SMEs in Ethiopia except compatibility of AISs, relative advantage of AISs, and competitive pressure from similar businesses. Since the econometric model (equation) in a binary logistic regression is non-linear by its nature, only the signs of the coefficients and odds ratio (Exp(B)) can be directly interpreted as follows:

As far as complexity of AISs is concerned, it is observed in the above that the estimated odds ratio is 0.170, indicating SMEs that perceive AIS technologies are complex are 17% less likely to implement it compared with other SMEs which have no perception of complexity of AISs. This result supported the existing argument, which states that if AIS technologies are complex enough (i.e. difficult to understand & use, require high technical & operating skill and need cooperative) the tendency to implement AISs should be lower. This finding is supported by studies such as [30, 31]. On the other hand, from the above table, the estimated odds ratio of owner (manager) support is 0.054, which means that organizations which have management support are 5.4% more likely to implement AIS technologies than organizations which lack management support. This finding is similar with the findings of some empirical evidences such as [8, 21, 22].

With regard to Employees' IT competence, the regression analysis indicated that it has an estimated odds ratio of 0.508, which could be interpreted as those SMEs that have hired IT

skilled employees are 50.8% more likely to implement AIS technologies than SMEs which have not hired IT competent employees. Ethiopia is known for lack of information technology experts in general and AISexperts in particular. This result is consistent with the findings of previously done studies like [8, 19, 23]

Another statistically significant variable in the above table is organizational readiness, which shows estimated odds ratio of 3.133. This result illustrated that those SMEs that have organizational readiness in terms of financial capacity, information system equipments, and suitable working conditions are 3.133 times more likely to implement AIS technologies than SMEs which have less organizational readiness. This result has much empirical supports such as [15] and [10]. Similarly, the estimated odds ratio of government support in terms of drafting regulations that favor AISs implementation, financial subsidies, and reducing taxes for SME's to acquire and implement AIS technologies shows 2.693 in the above regression analysis. This finding indicated that those SMEs that receive government support are 2.693 times more likely to implement AIS technologies than those SMEs that have not yet receive government support. This finding is supported by researches such as [24] and [10]. Therefore, from the proposed hypotheses, H<sub>2</sub>, H<sub>4</sub>, H<sub>5</sub>, H<sub>6</sub>, & H<sub>8</sub> are accepted as factors affecting AIS technologies implementation among SMEs in Ethiopia.

## 5. Conclusions and Implications

The findings drawn from this study are of outmost assistance to SMEs policy makers to improve and automate the accounting systems of these growing businesses so that their competitiveness would be increased in the global market. The result of this paper could also help SMEs to understand and identify determinants of AISs implementation so that they will be able to find ways to improve their accounting systems for the sake of achieving better operational performance. Hence, it would be highly advisable that concerned stakeholders who work for the growth and development of SMEs to consider the practical implications of determinants of AISs, which is one of fundamental ingredient for the success of SMEs in particular and to all types of organizations in general.

The result revealed that among the attributes of innovation, complexity of AIS technologies is significantly affected AISs implementation among SMEs in Ethiopia. Therefore, it is recommended that business information system developers should make their product easy to use, user-friendly, and locally adaptable and more attractive for those businesses. On the other hand, organizational readiness and employees' IT competence are statistically significant variables that affect AISs implementation decisions of SMEs. Hence, it is suggested that SMEs should allocate significant amount of resources and IT competent human powers in a way that can facilitate implementation of AIS technologies.

Owners (managers) support in terms of budgeting human and monetary resources, coordinating work flows, and devoting higher commitments for the implementation of AIS technologies plays an important role. To this end, the study found that owners (managers) support is significantly associated with AISs implementation among SMEs in Ethiopia. Hence, SMEs owners (managers) should support the implementation of AIS technologies through mobilizing the necessary resources and devoted their time and effort to make sure that their business's accounting system is improved and automated. In the same token, the study confirmed that government support is one of the salient elements for AISs implementation. Thus, the government is called to support the implementation of AISs among SMEs in Ethiopia through designing favorable regulations that encourages SMEs to implement AIS technologies; provide subsidies for purchasing of information system equipments; allowing access to finance; and providing capacity building trainings in collaboration with higher institution and other stakeholder of SMEs. In doing so, the government would achieve its objectives of expanding and developing SMEs in Ethiopia.

### *Limitations and suggestion for future research*

As discussed in literatures, there are numerous variables associated with AISs implementation in different part of the world. However, this study only incorporates eight independent variables in one sector (SMEs) of the Ethiopian economy. Therefore, future researchers could extend the study by considering more variables and including other

sectors of the economy. Further, the study is limited to Bahirdar city administration, which could make it difficult to generalize the findings to all SMEs in Ethiopia. Hence, potential researcher could conduct similar studies by elongating the geographical areas of their study. Finally, lack of finance and absence of database regarding SMEs in Ethiopia were the critical limitations of this study. Thus, future researcher should consider getting finances from stakeholders to produce relevant papers

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## References

- [1] United Nations Industrial Development Organization, 2015. Industrial Development Report, 2016. The Role of Technology and Innovation in Inclusive and Sustainable Industrial Development. Vienna, Austria.
- [2] Addis Fortune newspaper (September, 2016), Interview with AsfawAbebe, Director of Small and Medium Manufacturing Industry Development Agency. Addis Ababa, Ethiopia.
- [3] Jabar, J., Soosay, C., Santa, R. (2010). Organizational learning's an antecedent of technology transfer and new product development: A study of manufacturing firms in Malaysia. *Journal of Manufacturing Technology Management*, 22(1).
- [4] Lim, C. F. (2013). Impact of Information Technology on Accounting Systems. *Asia-pacific journal of Multimedia Services Convergent with Art, Humanities, and Sociology*, 3(2).
- [5] Sailer, E. R. (1966). Accounting, Information systems, and underdeveloped nations. *The Accounting Review*, 41(4), 652-656.
- [6] Ndekwa, G. A. (2015). Determinants of adopter and non-adopter of computerized accounting information systems among small and medium enterprises in Tanzania. *International Journal of Innovative Science, Engineering & Technology*, 2(1), 438-449.
- [7] Grande, Estebanez, & Colomina (2011). The impact of Accounting Information Systems (AIS) on performance measures: empirical evidence in Spanish SMEs. *The International Journal of Digital accounting Research*, 11(1).
- [8] Abate, A. A. (2018). Determinants of Accounting Information Systems adoption in Ethiopia: Empirical evidence from large and medium manufacturing enterprises in Addis Ababa. *International Journal of applied research*, 4, 4-12.
- [9] Alamin, A., Yeoh, W., Warren, M. & Salzman, S. (2015). An empirical study of factors influencing accounting information systems adoption among accountants. *Twenty-Third European conferences on Information Systems*, Münster, Germany.
- [10] Lutfi, A. A., Indris, M. K., & Mohamad, R. (2016). The influence of Technological, Organizational & Environmental factors on accounting information systems usage among Jordanian small and medium-sized enterprises. *International journal of economics & financial issues*, 6(7), 240-248.
- [11] Nyang'au, R. N., Okibo, B. W., & Nyanga'u, A. (2015). Constraints affecting adoption of computerized accounting systems in Nyeri, Kenya. *International Journal of Economics, Commerce and Management*, 3(5), 1536 - 1554.



- [12] Sam, M. F. M., Hoshino, Y., & Tahir, H. N. (2012). The adoptions of computerized accounting systems in small and medium enterprises in Melaka, Malaysia. *International Journal of Business and Management*, 7(18), 12-25.
- [13] Ngadiman, Pambudi, D., Wardani, D. K., & Sabandi, M. (2014). Determinants of accounting information technology adoption in Syria microfinance institutions. *Journal of Asian Social Science*, 10(14), 93-105.
- [14] Awosejo, P. P., Ajala, E. B., & Agunbiade, O. Y. (2014). Adoption of Accounting Information Systems in an Organization in South Africa. *African Journal of Computer & ICT*, 7(1), 127-136.
- [15] Rosli, K., Yeow, P. H., & Eu-Gené, S. (2013) Adoption of Audit Technology in Audit Firms. 24<sup>th</sup> Australasian Conference on Information Systems. Melbourne, Australia.
- [16] Muhrtala, O., & Ogundéji, G. M. (2013). Determinants of accounting software choice. An empirical approach. *Universal Journal of Accounting and Finance*, 2(1), 24-31.
- [17] Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS quarterly*, 3(27), 425-478.
- [18] Edison, G., Manuere, F., & Joseph, M. (2012). Evaluation of factors influencing adoption of accounting information system by small to medium enterprises in Chinhoyi. *Interdisciplinary journal of contemporary research in business*, 4(6), 1126-1141.
- [19] Thong, J. Y. L. (1999). An Integrated Model of Information Systems Adoption in Small Businesses. *Journal of Management Information Systems*, 15(4), 187-214.
- [20] Damanpour, F., and Schneider, M. (2009). Characteristics of Innovation and Innovation Adoption in Public Organizations: Assessing the Role of Managers. *Journal of Public Administration Research and Theory*, 19(3), 495-522.
- [21] Al-Qirim, N. (2007). The adoption of e-commerce communications and applications technologies in small businesses in New Zealand. *Electronic Commerce Research and Applications*, 6, 462-473.
- [22] Premkumar, G., & Roberts, M. (1999). Adoption of new information technologies in rural small businesses. *Omega: International Journal of Management Science*, 27(4), 467-484.
- [23] Ismail, W. N. S & Ali, A. (2012). Conceptual model for examining the factors that influence the likelihood of computerized accounting information systems (CAIS) adoption among Malaysian SMEs. *International Journal of Information Technology and Business Management*, 15(1), 122-151.
- [24] Kumlachew, M. (2015). Technology adoption of Ethiopian manufacturing firms: the case of Textile and Leather sector. Master's thesis submitted to Public Administration and Development Management of Addis Ababa University, Ethiopia.
- [25] Greene, W. H. (2003). *Econometric analysis*. 5th edition, Prentice Hall, Inc.
- [26] Micro and small enterprises development strategy, provision framework and methods of Implementation (2011). Federal democratic republic of Ethiopia. Addis Ababa, Ethiopia.
- [27] Field, A. (2009). *Discovering statistics using SPSS*. 3<sup>rd</sup> edition. SAGE publications inc. Los Angeles, USA.
- [28] Gujarati, N. D. (2003). *Basic econometrics*. 4<sup>th</sup> edition. McGraw-Hill. New York, USA.
- [29] Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E. and Tatham, R. L. (2010). *Multivariate data analysis* (7<sup>th</sup> ed.), Prentice Hall Upper Saddle River, NJ.
- [30] Amanamah, R. B., Morrison, A., & Asiedu, K. (2016). Computerized Accounting Systems Usage by Small and Medium Scale Enterprises in Kumasi Metropolis, Ghana. *Research Journal of Finance and Accounting*, 7, 16-29.
- [31] Juris, U. (2011). Information and communications technology factors for adoption and usage determinants in Latvian companies, doctoral thesis, Latvia.