SMEs' Adoption of Computerized Accounting Systems in the Rural North of Ghana

Francis Aboagye-Otchere
University of Ghana Business School
Department of Accounting
Legon, Accra, Ghana

Enusah Abdulai
University of Education-Winneba, Department of Accounting

Correspondence:
faotchere@ug.edu.gh
aenusah@uew.edu.gh

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Abstract:
This study investigates the drivers of Computerized Accounting Information Systems (CAIS) adoption intentions among SMEs in the rural North of Ghana. A Cross-Sectional Survey using structured Questionnaires was employed in gathering data from 800 SME owners in the Savanah region of Ghana. Data analysis was conducted using partial least squares structural equation modelling (PLS-SEM) and the findings suggest that SME owner innovativeness has a significant direct and indirect influence on CAIS adoption. Other factors found to have a significant influence on CAIS adoption include government support, technology complexity, relative advantage, and SMEs' readiness to adopt new technology. Neither security concerns nor the cost of CAIS was found to influence CAIS adoption intentions.

Key words: Small and Medium Enterprises (SMEs), Computerized Accounting Information Systems, Adoption

Introduction

Ample empirical evidence suggests that the non-adoption of appropriate information technology and improper accounting practices are among the major causes of underperformance among Small and Medium Enterprises (SMEs) in Africa (Abor & Quartey, 2010; Chege & Wang, 2020). Besides, many studies have attributed the poor performance of SMEs to their lack of quality information processing systems and their inability to meet the information processing requirements of interested parties (Tilahun, 2019). Using contemporary technology such as Computerized Accounting Information Systems (CAIS) can help SMEs overcome improper accounting challenges, improve information processing accuracy and enhance the overall quality of enterprise systems (Tilahun, 2019; Romney,

Steinbart & Cushing, 2015). Notwithstanding the potential benefits of CAIS, SMEs in the developing world often struggle to adopt such technologies and are denied their benefits (Abor & Quartey, 2010; Chege & Wang, 2020). In this regard, we investigate the drivers of CAIS adoption among SMEs in the three northern regions of Ghana, drawing on Thong's (1999) theory of SME information technology adoption. Thong (1999) asserts that SME owners' technological, environmental, organizational and personal characteristics influence their adoption of information technology. This study is unique from existing studies because it focuses on SMEs located in one of the economically challenged regions of a developing country. Besides, unlike studies in large firms, this study accounts for the effect of SME owners' characteristics on technology adoption since they directly influence the decision-making process, such as the decision to adopt a particular Information Technology.

The study expects the following: 1) From the technological perspective of Thong's (1999) model, we expect that Ease of Use and Relative Advantage of CAIS will influence CAIS adoption positively, while Security Risk and Cost of CAIS are expected to have a negative effect. 2) from an environmental perspective, we expect government support to influence CAIS adoption positively 3) From an organizational perspective, we expect organizational readiness (e.g., available I.T infrastructure) to affect adoption positively 4) from the personal characteristics dimension, we expect SME owner's innovativeness to directly affect adoption decisions positively. SME owner innovativeness is also expected to indirectly affect CAIS adoption through the mediation role of organizational readiness.

The remainder of the study is organized as follows: Section two reviews the literature on CAIS adoption and develops the research hypotheses. Section three discusses the research methodology, while section four describes the sample and analyzes the empirical results. Finally, section five concludes the study.

CAIS Concepts, Developments and Applications

Contemporary accounting information systems incorporate a broad scope that captures financial and non-financial business processes at the operational, tactical, and strategic levels of business. Such features of contemporary AIS can be beneficial to SMEs in achieving organizational goals. Empirical evidence suggests that accounting information systems are composed of three subsystems, with each system representing a certain managerial level (Hall, 2015). First, the transaction processing system (TPS) supports daily operational requirements such as generating and recording receipts, wage calculation, book-keeping, and journalizing (Hall, 2015; Bagranoff, Simkin & Norman, 2014). The second sub-component of AIS comprises the General Ledger or Financial Reporting System (GL/FRS), which generates accounting statements such as the statement of profit. According to Hall (2011), the second sub-component of AIS is oriented towards supporting the tactical level of management. Finally, the third subcomponent of AIS, which is the management reporting system (MRS), supports strategic decisions (Rom & Rohde, 2007). Most of the data provided by AIS at this level tends to be special-purpose financial reports needed for strategic

decision making in areas encompassing budgets, variance reports, responsibility reports, cost control, relevant costing, among others (Marshall & Steinbart, 2015).

The passage of time has witnessed technological innovations that have changed the way businesses manage and process accounting data. Initially, AIS mainly helped firms manage accounting data, such as timely information processing and the generation of accurate and reliable information (Mancini, Lamboglia, Castellano & Corsi, 2017). However, AIS technologies have shifted emphasis towards business process integration, as highlighted in Mancini et al. (2017). As Mancini et al. (2017) argue, such integration does not merely represent the implications of information technology. Instead, it represents a different philosophical lens by which one can observe organizational processes through information technology (IT). For instance, ubiquity and data sharing describes the new philosophy in AIS practice. In terms of ubiquity, there is an increasing demand for accounting data and information to flow freely (without restrictions) among firms, groups of people, and even across several functional business areas. Besides, Mancini et al. (2016) note that the present generation of AIS requires accounting information to be organized and managed to facilitate data sharing and reuse. Recently, large volumes of data on the internet and social media have ushered in the concept of big data analytics. Capgemini (2015) notes that businesses are increasing investment in big data analytics to get valuable insights that can lead to efficiency, cost focus, and growth of existing revenue streams. Accordingly, AIS technologies that incorporate big data analytics can assist management accountants in undertaking cost reduction strategies, for example, by streamlining the supply chain to eliminate inefficient processes, fraud and improve risk management (Mancini et al., 2017).

Another noteworthy development in CAIS is the advent of the eXtensible Business Reporting Language (XBRL). In recent years, the eXtensible Business Reporting Language (XBRL) has been proposed and implemented as "a digital and open standardized language applied to financial reports of private companies" (Mancini et al., 2017, p. 14). Such accounting information systems provide a uniform and standardized platform through which firms can report accounting data. In about ten years past (since 2008), the Securities and Exchange Commission (SEC-USA), the United Kingdom's Revenue and Customs (HMRC), and Companies House of Singapore began requiring companies to adopt XBRL as their financial reporting platform (Bhattacharya, Cho, & Kim, 2018). This is because it is believed that XBRL makes financial data readable and understandable by any software, and thus helps improve transparency and efficiency through savings in time, costs, resources, and risks of error (Lai, Lin, Lin & Huang, 2015).

Additionally, the advent of social media and cloud accounting has enhanced the scope of accounting information systems. Presently, social network tools encompassing blogs, wikis, and social messaging (for example, Twitter, and Facebook.) are opening new avenues for disclosure of accounting information and improving stakeholder dialogue and participation. Also, accounting information system practitioners are gradually embracing the concept of cloud accounting based on SaaS. SaaS, pronounced "software-as-a-service", is an

alternative means to access software via a centrally hosted server on the internet, as against the more traditional methods of purchasing AIS software and hosting it locally. Vendors who provide such services are called SaaS providers. In the developed world, most firms (especially SMEs) that cannot afford to build their own AIS and big data centres increasingly resort to the use of CAIS based on SaaS (KPMG, 2013; Brandas, Megan, & Didraga, 2015). According to Brandas et al. (2015), the use of AIS cloud technologies significantly reduces costs associated with CAIS acquisition, maintenance, management of hardware and software, among others.

Theoretical framework and Research Model

SME owners usually have a direct influence on their firm's operations and decision making. Therefore, it is imperative to use theories that integrate both individual and firm-level features of technology adoption (Thong, 1999; Rahayu & Day, 2015; Ghobakhloo et al., 2011). Prominent theories in the technology adoption literature include the Theory of Planned Behavior (TPB-Ajzen, 1985), Technology Acceptance Model (TAM-Davis, 1989), Unified Theory of Acceptance and Use of Technology (UTAUT-Venkatesh et al., 2003), Diffusion of Innovation Theory (DOI-Rogers, 1995), Technology-Organization-Environment Framework (TOE-Tornatzky & Fleischer, 1990), and Institutional Theory (IT-DiMaggio & Powell, 1983). However, most of these theories either operate at the firm level only or individual level only, hence they may not adequately capture the dual nature of SMEs, where both firm-level and individual-level characteristics of owners are significant determinants of decision outcomes (Rahayu & Day, 2005).

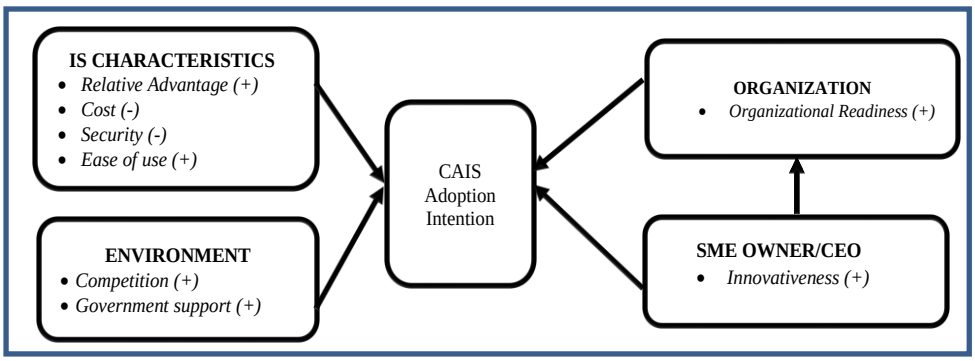
In response to these limitations in existing theories, Thong (1999) developed a model to explain technology adoption at the SME level, where SME owners' characteristics, as well as SME firm characteristics, are incorporated in explaining technology adoption. Therefore, this study adopts Thong's (1999) model in explaining the adoption of CAIS among SMEs that operate in selected rural communities of Ghana.

In Thong's (1999) model, he suggests that technology adoption among SMEs is influenced by three firm-level factors and one individual-level factor. The firm-level factors entail organizational characteristics, environmental characteristics, and information system characteristics, while the individual-level factors entail SME owner/CEO characteristics. Within the literature, Thong's model of technology adoption is unique due to its emphasis on SMEs on the one hand, and its incorporation of constructs that measure SME owners' characteristics. Besides, another strength of Thong's model lies in its ability to recognize that environmental factors may impact SME's technology adoption decisions. In figure 1, we present a modified version of Thongs (1999) model to explain the adoption of computerized accounting information systems among SMEs operating in rural communities in Ghana. Our major modifications to Thong's model can be found in our attempt to examine whether organizational readiness mediates the relationship between SME owner characteristics and technology adoption. The intuition is that a highly innovative SME owner is more likely to prepare His firm for technology adoption, hence subsequent adoption. Such preparation is

what this study refers to as organizational readiness, and it might include ensuring the availability of IT infrastructure, and IT capable employees among others. Therefore, an innovative owner will get His firm ready to adopt information systems, and the readiness will in turn lead to adoption.

Hypotheses on the determinants of CAIS adoption

Figure 1. Research Model



Adapted: Thong (1999)

From figure 1, three firm-level constructs (Information systems characteristics, organizational characteristics, and environmental characteristics), and one individual-level construct (SME owner innovativeness) are hypothesized to influence the adoption of CAIS among SMEs. These are discussed below.

Relative Advantage and CAIS adoption

Relative advantage refers to the benefits that a firm stands to gain by adopting a particular technology rather than otherwise. Rogers (1985) defines it as the degree to which a technological factor is perceived as providing greater benefit for firms. Taiwo and Taiwo (2016) and Dekeng (2014) found that AIS adoption improves both financial and non-financial performance of firms, whereas Ware (2015) concluded that adoption of CAIS enhances financial reporting quality. Such benefits are not limited to the private but also the public sector. Appiah, Agyemang, Agyei, Nketiah and Mensah (2014) suggest that the potential benefits of CAIS adoption include improved processing speed and accuracy, improved decision making, and enhanced work-life of employees. In essence, these findings suggest that SMEs will be more likely to adopt CAIS technology if they perceive that it will bring new benefits on board. Hence, the study hypothesis that:

H1: There is a positive relationship between Relative Advantage and CAIS adoption among SMEs.

Ease of use and CAIS Adoption

Rogers (2003, p. 257) defines complexity as "the degree to which innovation is

perceived as relatively difficult to understand and use". According to Premkumar and Roberts (1999), complexity creates uncertainty regarding the successful implementation of innovation and thus may negatively impede technology adoption (Rogers, 1995). Researchers encompassing Thong (1999), Grandon and Pearson (2004), Wang et al. (2010) and Gwangwava et al. (2012) document that a high level of technical complexity negatively affects technology adoption. This is particularly important because SMEs usually lack the wherewithal to employ a highly skilled workforce to manage sophisticated IT infrastructure. Therefore, a technology that is easy to use is more likely to be adopted by SMEs. As a result, the study hypothesis is that:

H2: There is a positive relationship between ease of use and CAIS adoption among SMEs.

Cost and CAIS Adoption

CAIS) and implementation and maintenance costs. Generally, SMEs in developing countries, and for that matter, rural areas are characterized by inadequate financial resources and tend to adopt relatively cheaper information technology (Thong, 1999; Senyo, Effah & Addae, 2016). However, recent research findings regarding the influence of cost on technology adoption are mixed. For instance, in Nigeria, whereas Irefin, Abdu-Azeez, Tijani (2012) found that cost significantly influences technology adoption among SMEs, Adebayo, Idowu, Yusuf and Bolarinwa (2013) did not find any significant relationship, although both studies were conducted in the same country. In the United States, Bressler and Bressler (2006) were shocked to learn that cost was not among the top determinants of CAIS adoption, whereas in Kenya, Nyang'au (2015) found cost to be the single most significant factor that influences CAIS adoption. This study envisaged that the higher the cost of technology, the lower the likelihood of its adoption. Hence, the study hypothesis that:

H3: Cost has a negative influence on CAIS adoption among SMEs.

Security Risk and CAIS Adoption

Contextually, risk is defined as uncertainty about potential negative consequences of adopting computerized accounting information systems (CAIS). In Jordan, DHanini (2012) documents that users of computerized accounting systems face risks encompassing compromise by viruses, unauthorized access to data, and risks regarding natural and unnatural disasters done by humans. In addition, Ngadiman, Pambudi, Kusuma Wardani and Sabandi (2014) found that risks associated with performance, finance, and security negatively influence the adoption of accounting information systems. Other issues related to system downtimes and hardware malfunctions may impact negatively on firm performance. The study, therefore, hypothesizes that:

H4: Perceived risk negatively impacts CAIS adoption among SMEs.

Organizational and individual determinants of CAIS adoption

The Organizational Context of the TOE framework captures attributes of a firm that may influence technology adoption decisions. These attributes include the availability of resources (for example, computing infrastructure, technical skills, and financial resources), communications process, firm size, and slack resources (Oliviera & Martins, 2011). For instance,

Wang et al. (2010) and Gibbs & Kraemer (2004) find that technical competence and resource availability are organizational factors that drive technology adoption. Similar findings were made by Senyo, Effah and Addae (2016) and Rahayu and Day (2015). Therefore, the availability of organizational resources (for example, financial, computing infrastructure, and technical skills) may indicate SMEs' readiness to adopt CAIS and its eventual adoption. It is therefore hypothesized that:

H5: Organizational Readiness has a direct positive influence on CAIS adoption among SMEs.

Additionally, because SME owners/CEOs usually play a crucial role in their business's management and decision-making process, an owner/CEO that is highly innovative will be more likely to prepare his firm for CAIS adoption (Thong, 1999). A highly innovative SME owner is more likely to appreciate the benefits of adopting modern technologies like CAIS, hence making available the needed resources (for example, financial, computing infrastructure, and technical skills) to adopt the technology. This suggests that SME owners' innovativeness may impact CAIS adoption through organizational readiness. Therefore, organizational readiness may mediate the relationship between owner innovativeness and CAIS adoption.

H6: SME owner innovativeness directly influences CAIS adoption among SMEs.

H7: Organizational readiness mediates the relationship between owner innovativeness and CAIS adoption.

Environmental determinants of CAIS adoption

Tornazky and Fleischer (1990) and Thong (1999) posit that the environmental context of a business influences its decision to adopt information technology. Notably, factors such as the regulatory environment can influence SMEs to adopt a particular technology. In this study, we examine the effect of government support on SMEs' technology adoption.

Government Support and CAIS Adoption

Ample scholarly evidence shows the significance of government support for technology adoption at the firm level. For example, Al-Hawamdeh (2002) and Martinsons (2008) found that technology adoption decisions at the firm level are greatly influenced by governments' participatory role in providing the empowering infrastructure and other support necessary for technology adoption to thrive. For example, Al-Hawamdeh (2002), cited in Awiagah, Kang & Lim (2016), argues that SMEs in Singapore make greater use of ICT because the Government established the Small Enterprise Computerization Program (SECP), which encouraged and assisted SMEs to become more competitive through ICT application. In a related study, Seyal et al. (2004) found a significant relationship between government support and technology adoption. Awiagah et al. (2016) also concluded that government support is the most influential factor driving technology adoption among Ghana SMEs. To this extent, the study hypothesis is that:

H 9: Government support has a positive influence on CAIS adoption among SMEs

Methodology

The study seeks to investigate the factors that influence SMEs' adoption of CAIS in the rural north of Ghana. Therefore, the quantitative research method was implemented to test the hypothesized relationships (Sekaran & Bougie, 2016; Saunders, Lewis, & Thornhill, 2016).

Population, Sample and Measures

The research population is constituted by SMEs in the Savanah region of Ghana. Unlike other studies, this study emphasizes SMEs operating in deprived rural communities which adds a new perspective to technology adoption research. Deprived communities can be differentiated by their lack of technology infrastructure, poverty, the lack of motorable roads, and lack of health facilities among others. Following Amidu et al (2011) and guidelines offered by the Ghana Enterprises Agency (GEA), formerly the National Board for Small Scale Industries (NBSSI), the study defines SMEs as firms having less than 100 employees. The GEA was established by an Act of parliament to create an enabling environment for SME development in Ghana (Amidu et al., 2011). In all, the study retrieved 800 valid questionnaires out of 818 that were randomly administered. The study employed a 5-point Likert scale questionnaire adapted from prior literature and informed by Thong's Model of technology adoption among SMEs.

Data Analysis

The PLS-SEM statistical technique was employed as the main data analysis technique. Our study is explanatory; hence PLS-SEM is appropriate because of its ability to simultaneously predict causal relationships among latent constructs while dealing with measurement errors in the structural model (Hair et al., 2017). Besides, PLS-SEM works efficiently with small sample sizes, has fewer identification problems, and makes no strict assumptions about data distribution due to its non-parametric nature (Hair et al., 2017). et al., 2011).

Results and Discussion

Demographics

Out of the 800 valid responses received,73% were answered by male SME owners while 27% were answered by female SME owners. The gender distribution reflects the dominance of male entrepreneurs in SME establishments (Darnihamedani & Terjesen, 2020; Chaudhuri, Sasidharan & Raj, 2020). Additionally, the respondents indicated that should they adopt CAIS, they would use it for Internal control, General ledger management, Inventory management, Payroll management, financial reporting, Receivable Management and Payable management. Specifically, 73% of respondents intend to use CAIS for internal control, 72.75% to manage general ledger, while 68.88% intend to use CAIS for payroll management. Additionally, 62%, 63% and 59% intend to use CAIS for financial reporting, receivable management, and payable management.

Table 1. Intended use of CAIS

CAIS application Intentions	Frequency	Percent
Internal control	585	73.13
General ledger	582	72.75
Inventory management	551	68.88
Payroll management	403	50.38
Financial reporting	496	62.00
Receivable Management	507	63.38
Payable management	472	59.00

Additionally, the study examined SMEs preferred mode of CAIS of adoption, whether they prefer to adopt off the shelf CAIS or bespoke CAIS. The findings revealed that the majority (78%) of SMEs prefer to adopt off-shelf CAIS, as compared to bespoke CAIS. Also, we find that SMEs who already use computer software for accounting purposes predominantly use general purpose software (especially, Microsoft Excel), while there is very limited use of special purpose accounting software.

Statistical evaluation of PLS-SEM: Evaluation of the Measurement Model

Following Hair et al. (2014; 2017), the measurement model was assessed for indicator reliability, internal consistency, convergence validity, and discriminant validity.

First, indicator reliability is a concept related to measurement model reliability. As a rule of thumb, an indicator whose loadings are at least 0.708 is assumed to be reliable (Hair et al., 2017). Initially, 32 indicators were used to measure the research model's eight (8) constructs. Out of 32 indicators, 20 had loadings above the 0.708 threshold, hence retained for further analysis. Also, an additional three indicators whose loadings were below 0.708 but above 0.65 were maintained based on content validity (Hair et al., 2014; Nunnally & Bernstein, 1994; Churchill, 1979). Therefore, a total of 23 indicators satisfied reliability assumptions and were retained in the measurement model. These indicators entail ORc, OINc, and EOUa whose loadings were 0.69, 0.67, and 0.69 respectively. However, nine indicators were deleted because they had weaker loadings that were far below the 0.708 threshold. Removal of the weak indicators was justified because their deletion improved the Average Variance Extracted (AVE) and Composite Reliability (CR) of underlying constructs (refer to table three). Secondly, as per Table 3, results show that internal consistency has been achieved since all the measurement items had composite reliability scores above the threshold value of 0.70 (Hair et al. 2014; 2017). This suggests that indicators that purport to measure the same underlying construct will produce similar scores (Hair et al., 2017). Additionally, the measurement model achieves convergent validity since the average variance extracted (AVE) value for all the

measurement items exceeds the threshold value of 0.50 (Hair et al. 2014; 2017). This implies that, on average, all the constructs in the research model can account for more than half (i.e., an AVE above 0.50) of the variance in their underlying indicator items.

Table 2 Indicator reliability diagnostics

	Adoption Intention	Cost	Ease of Use	Government Support	Organizational Readiness	Owner Innovativeness	Relative Advantage	Security Risk
	(AI)		(EOU)	(GS)	(OR)	(OIN)	(RA)	(SR)
AIa	0.85							
AIb	0.8							
AIc	0.76							
COSTa		0.77						
COSTc		0.92						
EOUa			0.69					
EOUb			0.76					
EOUc			0.86					
GSa				0.78				
GSb				0.77				
GSc				0.94				
OINa						0.79		
OINb						0.67		
OINc						0.79		
OINd						0.92		
ORa					0.78			
ORb					0.85			
ORc					0.69			
RAa							0.73	
RAb							0.7	
RAc							0.83	
SRa								0.74
SRb								0.89

Table 3 Construct reliability and validity

	Composite Reliability	Average Variance Extracted (AVE)
Adoption Intention	0.85	0.65
Cost	0.84	0.72
Ease of Use	0.82	0.60
Government Support	0.87	0.70
Organizational Readiness	0.82	0.60
Owner Innovativeness	0.87	0.64
Relative Advantage	0.80	0.57
Security Risk	0.80	0.67

The latent constructs were examined using Additionally, the measurement model satisfies discriminant validity assumptions because results in Table 4 suggests that the Heterotrait-Monotrait Ratio (HTMT) for all the constructs are lesser than the threshold limit of 0.9 (Hair et al., 2017). This suggests that concepts or measurements that ought not to be related are actually not related.

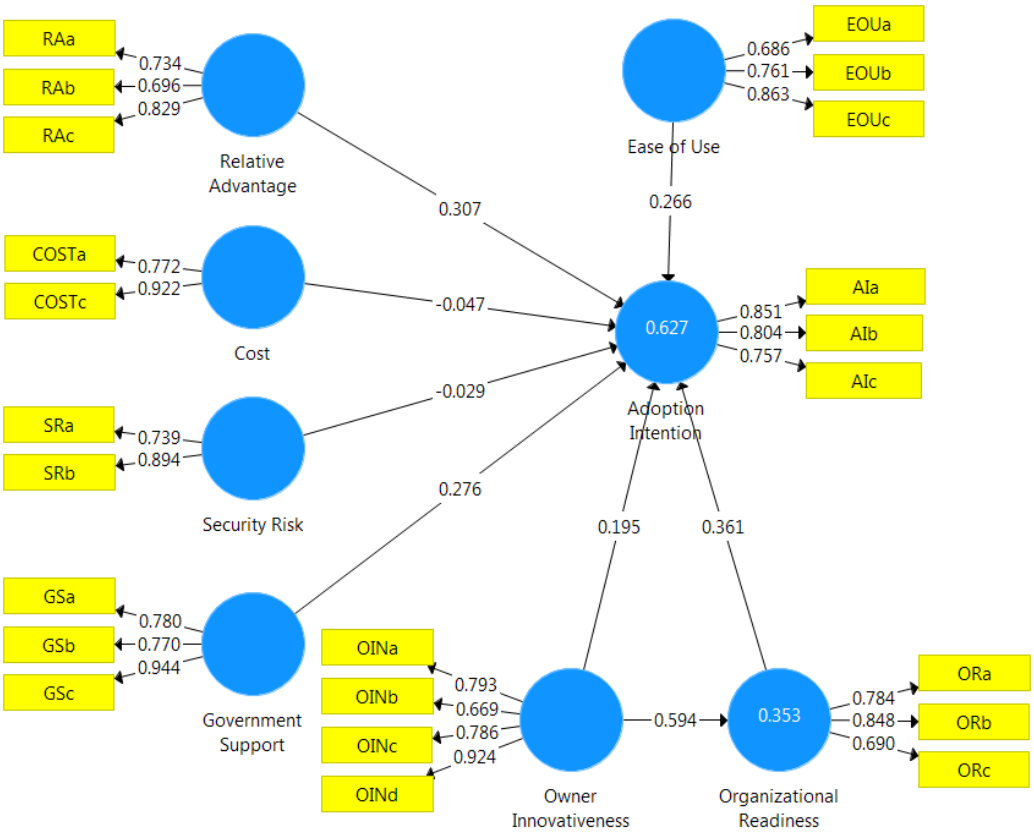
Table 4 Heterotrait-Monotrait Ratio (HTMT)

	Adoption Intention	Cost	Ease of Use	Government Support	Organizational Readiness	Owner Innovativeness	Relative Advantage
Cost	0.63						
Ease of Use	0.57	0.54					
Government Support	0.47	0.3	0.31				
Organizational Readiness	0.84	0.55	0.4	0.29			
Owner Innovativeness	0.4	0.24	0.19	0.18	0.69		
Relative Advantage	0.42	0.52	0.46	0.43	0.32	0.43	
Security Risk	0.11	0.04	0.08	0.14	0.03	0.06	0.1

Evaluation of the Structural Model

In general, the proposed model has 62.7% explanatory power for CAIS adoption intention among SMEs in the rural north of Ghana (i.e., R2 = 62.7%, see Figure 2).

Figure 2 Final Estimated Research Model



The coefficient of determination in Figure two suggests that exogenous variables in the research model explain approximately 62.7% of the variation in CAIS adoption intentions among SMEs in the rural North of Ghana (Chin, 1998; Moore, 2013). To ensure the reliability and validity of this result, the structural model was assessed for multicollinearity using variance inflation factors (VIF), explanatory power using the coefficient of determination (R2), predictive relevance using Q2, and path significance using P-values and β-values. The results are contained in Table five and six below.

Table 5 Variance Inflation Factors

	Adoption Intention	Organizational Readiness
Cost	1.55	
Ease of Use	1.17	
Government Support	1.18	
Organizational Readiness	1.96	
Owner Innovativeness	1.91	1
Relative Advantage	1.41	
Security Risk	1.02	

Results in Table 5 suggest that the structural model does not suffer from multicollinearity problems since all the constructs had variance inflation factors below five. Moreover, the structural model has predictive relevance since the dependent constructs had a cross-validated redundancy (Q2) values greater than zero (0). Thus, the dependent construct "Adoption intention" had Q2 of 0.392, while that of "organizational readiness" had a Q2 of 0.191 importance concerning the independent variable. However, the negative beta value between perceived risk (-0.176) shows an inverse impact.

Significance of path relationships

Table 6 Structural Model Diagnostics

	P Values	β	f^2
Cost -> Adoption Intention	0.07	-0.05	**0.004**
Ease of Use -> Adoption Intention	0.00	0.27	**0.161**
Government Support -> Adoption Intention	0.00	0.28	**0.172**
Organizational Readiness -> Adoption Intention	0.00	0.36	**0.178**
Owner Innovativeness -> Adoption Intention	0.00	0.19	0.053
Owner Innovativeness -> Organizational Readiness	0.00	0.59	**0.545**
Relative Advantage -> Adoption Intention	0.00	0.31	**0.178**
Security Risk -> Adoption Intention	0.18	-0.03	**0.002**

Concerning the technological determinants of CAIS adoption, relative advantage established a significant positive relationship with adoption intention (β=0.31; P-Value=0.000), whereas cost established an insignificant negative relationship (β = -0.05; P-Value=0.07). This provides support for H1, while H3 is not supported (refer to table four). Also, ease of use established a significant positive relationship with CAIS adoption intentions (β = 0.27; P-Value=0.00), offering support for H2. Security concern on the other hand failed to establish a significant relationship with CAIS adoption intentions, hence H4 is not supported.

Preacher and Hays' (2008) bootstrapping approach to mediation analysis was used to analyze the organizational dimension of CAIS adoption. The bootstrapping approach is premised on three conditions, however, the third condition is contested and often ignored (Carrión, Nitzl & Roldán, 2017). Following Carrión et al. (2017), the study uses the first two conditions to examine the presence of mediation. The first condition is that there should be a significant direct path relationship between the independent and dependent variable before introducing the mediator (i.e., owner innovativeness → CAIS adoption must be significant); the second condition is that there should be a significant indirect path relationship after introducing the mediator variable (i.e., owner innovativeness → organizational readiness → CAIS adoption). In regard to these conditions, the direct path relationship (i.e., owner innovativeness → CAIS adoption) was first estimated without the mediator, and the results reveal a statistically significant relationship at a 5 percent significance level (P-Value = 0.00), hence the first condition for mediation was met. The second condition was also met because the indirect path relationship was significant after introducing the mediator variable (P-Value = 0.00), suggesting that including organizational readiness (in the research model) as a mediator is meaningful. The mediation is a partial mediation since both the direct and indirect effects are significant (Carrión, Nitzl, & Roldán, 2017). Thus, Carrión et al. (2017, p 176-177) states that "a full mediation is indicated in the case where the direct effect is not significant, whereas the indirect effect is significant, all other situations under the condition that both the direct effect and the indirect effect are significant represent partial mediation".

On the whole, the study finds a strong direct and indirect relationship between owner innovativeness and CAIS adoption intentions. Notably, owner innovativeness established a positive significant effect on CAIS adoption intention (β = 0.19; P-Value=0.00). At the same, Owner innovativeness also established indirect positive effect on CAIS adoption intensions through organizational readiness (β = 0.36; P-Value=0.00).

On the environmental dimension of CAIS adoption intentions, the results revealed a significant positive effect of government support on CAIS adoption intentions among SMEs (β =0.28; P-Value =0.00).

Discussion of Results

"It has often been said that accounting is the language of business. If that is the case, then an accounting information system (AIS) is the intelligence—the information-providing vehicle— of that language "(Romney & Steinbart, 2017, p.10). We agree with Romney and Steinbart (2017), as we argue that there is a dire need for SMEs to adopt computerized

accounting information technology if they must thrive. This is because the advent of information technology has redefined how businesses operate, compete and survive (Romney & Steinbart, 2017; García-Cabrera, García-Soto & Olivares-Mesa, 2019). To survive in the 21st century, SMEs ought to use IT systems that efficiently process information and integrate business functional areas. Rogers (2016) believes that firms who fail to respond appropriately to the technological environment will be forced out of competition as they become less efficient. This explains why there is a need to investigate and understand the drivers of CAIS adoption among SMEs.

Consistent with Ismail and Ali (2013), our findings suggest that SMEs will be willing to adopt CAIS if they perceive the benefits of adoption to be high. Prior literature indicates that the advantages of CAIS adoption include improved financial reporting quality, efficiency, improved decision making, enhanced processing speed, processing accuracy, and improved work-life balance (Nguyen et al., 2015; Ware, 2015; Agyemang, Agyei, Nketiah & Mensah, 2014). Notwithstanding, the challenge we identified in our study was that most of the SMEs surveyed only applied general-purpose software such as office processing applications (e.g., Microsoft Excel) in executing accounting transactions. This may limit the extent of benefits that SMEs derive from the application of CAIS.

Additionally, the results revealed that cost has a negative but insignificant effect on CAIS adoption. This result was not expected because our initial conceptualization was that firms operating in rural areas may lack the financial wherewithal to adopt and maintain technological innovations. Therefore, the findings contradict earlier research which establishes a negative significant relationship between cost of technology and adoption intention (Thong, 1999; Senyo, Effah & Addae, 2016; Nyang'au, 2015). Our finding is however supported by the earlier study of Yusuf and Bolarinwa (2013) and Bressler and Bressler (2006) who also did not identify any statistical relationship between cost and accounting technology adoption. The contradictory findings might be explained by the nature of CAIS technology adopted by or known to SMEs in rural areas. In the study, we documented that most of the SMEs consider Microsoft Excel applications as their preferred accounting software. Hence, considering the wide availability of Microsoft Excel and its affordability, it is not surprising for the respondents to indicate that cost does not impede their adoption intentions of CAIS.

In their study, Premkumar and Roberts (1999) revealed that technological complexity creates uncertainties about the successful implementation of a particular innovation and that firms are less likely to adopt complex technologies. Consistently, our results suggest that SMEs will be more likely adopt CAIS if it is less complex to learn, implement and use. Therefore, our findings on technology complexity ccomplements prior studies (for example, Grandon & Pearson, 2004; Gwangwava et al., 2012) which found that complexity is negatively associated with technology adoption. Notably, SMEs in rural areas may not have the resources to employ skilled employee to operate complex technologies, and even if they have the resources, it might be difficult to attract such skilled employees due to their

geographical location and its associated downsides. Therefore, most SMEs are likely to prefer easy to use CAIS technologies over complex ones.

Regarding security risk, we find that security concerns do not have any significant influence on CAIS adoption. That is, in the context of SMEs in developing countries, especially, the rural north of Ghana, we do not find support for prior literature (for example, Ngadiman et al., 2014) which posits that the perceived risks of using a particular technology (for example, privacy breaches and data compromise) negatively impact its subsequent adoption. It happens that the SMEs who participated in the study do not make extensive use of CAIS, hence have limited reliance on CAIS as far as executing accounting tasks are concerned. This suggests that these SMEs will incur minimal losses even if potential security threats of CAIS adoption materialize, and this may explain why security vulnerabilities do not have significant effect on SMEs CAIS adoption intentions.

On the organizational determinants of CAIS adoption, findings in this study reveal that SME owner innovation characteristics and organizational readiness have the most significant impact on CAIS adoption. In SMEs, owners usually play a crucial role in decision making, and the level of owner innovativeness (for example, creativity, IT skills and experience) drives technology adoption (Thong, 1999; Rahayu & Day, 2015; Alam & Dubey, 2014; Nguyen, Newby & Macaulay, 2015). It is believed that highly innovative owners are more likely to prepare their firms to adopt accounting information systems. For instance, a highly innovative owner will support CAIS adoption by providing the necessary infrastructure and technical know-how to adopt CAIS (Thong, 1999; Rahayu & Day, 2015; Udagedara & Allman, 2019). Furthermore, the study results show that SME owner innovativeness influences organizational readiness to adopt CAIS, thereby leading to eventual adoption intentions (level of owner innovativeness→ the extent of organizational readiness to adopt CAIS → subsequent adoption). Thus, owners of SMEs usually play managerial roles; hence their support is critical in technology adoption decisions. This finding is consistent with other studies which emphasize that managerial support drives technology adoption at the firm level (Kim, Jang & Yang, 2017; Nguyen, Newby, & Macaulay, 2015; Pathan, Jianqiu, Akram, Latif, Khan & Tunio, 2017). For Kim et al. (2017), managerial support is considered a more important determinant of technology adoption than the resources or IT capacity for technology adoption.

Moreover, the study reveals that government support is a crucial driver of CAIS adoption among SMEs in developing countries. Government support could either be financial (where the government subsidizes the cost of technology adoption) or regulatory (where the government ensures a favorable regulatory environment exists to support technology adoption – for example, laws preventing cybercrime, and tax exemptions for the cost of ICT training). This finding is in line with the earlier findings by Awiagah et al. (2016) who noted that in Ghana, government support is the most significant driver of technology adoption among SMEs. As early as 2002, Al-Hawamdeh (2002) posited that SMEs in Singapore make greater use of information communication technology because the Singaporean Government

ratified the Small Enterprise Computerization Program (SECP), which encouraged and assisted SMEs to become more competitive through ICT application. Government support is usually crucial to SMEs because they typically cannot raise huge sums of money to adopt and implement sophisticated modern technology infrastructure.

Research Recommendations

Following the finding that Relative Advantage influences CAIS adoption, it is recommended that CAIS vendors should first gain knowledge about SME's desired attributes of a CAIS system and factor such concerns into the design and development of CAIS technology. Doing this will enhance the likelihood of patronage by SMEs since there is no reason to adopt a technology that is not perceived as being beneficial to the adopter. Furthermore, the marketing efforts should emphasize the perceived benefits of CAIS by clearly demonstrating the impact of CAIS technology on productivity, profitability, improved business processes, among others. It is also recommended that the marketing effort of CAIS vendors should target SMEs with innovative owners or CEOs. This is based on the findings that SME owners who are innovative are more likely to adopt CAIS than the less innovative ones. Besides, based on the finding that organizational readiness (in the form of technical know-how) influences CAIS adoption, the study recommends that SMEs supplement their inadequate knowledge by engaging external CAIS experts such as consulting firms to train their staff with the technical know-how. Finally, premised on the finding that owner innovativeness, organizational readiness, and government support strongly affect CAIS adoption, we recommend that government interventions aimed at improving technology adoption among SMEs should emphasize ICT education, training, and awareness creation programs among key decision-makers in SMEs. This will increase knowledge about the potential benefits of CAIS adoption, hence leading to subsequent adoption.

More importantly, just as the Singaporean Government ratified the Small Enterprise Computerization Program (SECP) to encourage SMEs to become more competitive through ICT, the Government of Ghana can enact an SME-specific ICT policy to address issues of ICT adoption among SMEs. Although the National Information and Communication Technology for Accelerated Development Policy was introduced in 2003 with the primary aim of engineering an ICT-led socio-economic development process in Ghana, such a policy was broad and was not adapted to the specific needs of SMEs.

Limitations and directions for further studies

The study emphasized Computerized Accounting Information Systems in general, without singling out any specific CAIS (like Computer Assisted Auditing Techniques or Big Data Analytics). Therefore, future studies are entreated to extend this study by examining the technological, organizational, and environmental determinants of a specific accounting information system. Also, this study employed a quantitative design and, as such, could not gather in-depth knowledge as to why respondents provided certain responses on CAIS adoption. As a result, future studies on the

phenomena under consideration are encouraged to use a qualitative design.

Declaration of Interest

We have no conflict of interest to declare.

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