

Mbogoro, Filbert; Masele, Juma James

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Kontakt/Contact

ZBW – Leibniz-Informationszentrum Wirtschaft/Leibniz Information Centre for Economics
Düsternbrooker Weg 120
24105 Kiel (Germany)
E-Mail: [rights\[at\]zbw.eu](mailto:rights[at]zbw.eu)
<https://www.zbw.eu/econis-archiv/>

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Adoption of Cash Deposits through Automated Teller Machines (ATMs) by Banks in Tanzania: A Case of Selected Commercial Banks in Dar es Salaam

Filbert Mbogoro¹ and Juma James Masele²

ABSTRACT

Cash deposits through Automated Teller Machines (ATMs) enable customers to ensure that the money they earn is kept safe without encountering any inconveniences. They also enable banks to increase income that can be used to generate credits to customers and generate profits to banks. This study was set to assess factors hindering commercial banks to adopt automatic cash deposit service using ATMs. Using the Transactions Cost Theory (TCT) and Technological, Organizational and Environmental (TOE) framework, three constructs were extracted and hypothesized as predictors for adoption of ATMs cash deposits. A multiple regression analysis was conducted to data gathered from 105 respondents selected from seven commercial banks namely CRDB Bank, National Microfinance Bank (NMB), National Bank of Commerce (NBC), First National Bank (FNB), Exim Bank Tanzania (EBT), Akiba Commercial Bank (ACB) and Access Bank (T) Ltd. It was found that all hypothesized variables (perceived cyber security; perceived costs of operations; and, facilitating conditions) significantly influenced adoption of ATMs cash deposits. For ATMs cash deposit services to be up taken, diffuse and get trusted as a reliable banking service by commercial banks in Tanzania, the responsible entities must work hard to ensure that security systems are reliable. Facilitating conditions are required to improve enabling/supporting security system infrastructures. The commercial banks need to market the service in order to attract more customers' cash deposits and cover the operating costs.

Key words: Adoption; Cash Deposits; Automated Teller Machines; ATMs; Commercial Banks; Tanzania

INTRODUCTION

Despite the broad consensus that ICT has the potential to benefit financial institutions, most of them have either not invested enough or not optimized the use of the tool in promoting efficiency and effectiveness in their financial services provision, hence competitiveness in the market (Elinaza, 2016; Frank, 2014; Sotunde, 2012). In commercial banks, for example, although technological advancements have enabled them to bring in several initiatives, such as *Simbanking*, internet banking, cash withdrawal using automated teller machines (ATMs) and others to improve customer services as well as bank competitiveness (Goldthwaite, 1995), the use of ICTs in some critical applications is still very low or not existent.

Cash deposit is one of the very important financial services offered by banks to customers. For customers, cash deposit is a mechanism to ensure that the money they earn is kept somewhere safe without encountering any inconveniences (Goldthwaite, 1995). For banks, it (cash deposit) enables the increase in income which can be used to generate credits to customers and generate profits. With that, it is within the needs of both banks and customers to have appropriate and quick

¹ Graduate from University of Dar-es-Salaam

² Senior Lecturer, Department of General Management, University of Dar es Salaam Business School, Tanzania. (Corresponding Author: maselej@gmail.com)

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measures to foster cash deposits for the greater good of each and every actor in the business (Macesich, 2000).

The adoption of cash deposits taking through ATMs is recommended worldwide as a way to improve efficiency through which the bank can serve its customers. Positively taken and practiced, the service is considered very useful, relevant and a highly conducive means to guarantee effective and efficient banking services through less time consumption and convenience of use by the customers (Hillier, 2002; Schneier, 2004; Schlichter, 2007). These positive perceptions of the system, to a great extent, reduce congestion. Furthermore, the system improves quality of services, bank brand acceptability and attractiveness thus positively impacting customer satisfaction and company's profitability.

Although cash deposits taking ATMs is worldwide an existing technology in banking industry for years (Macesich, 2000; Furrer & Sollberger, 2006), and, while individuals, corporate, governments, the economy at large and other actors in Tanzania, frequently engage banks for their cash deposits, the use of the services in the country is somewhat a new service. The adoption of the service has been low among the commercial banks in the country. Frank (2014) indicates cash deposit through the use of automated teller machines (ATMs) as the biggest concern among commercial banks in Tanzania. Although there are 40 registered banks in Tanzania, all equipped with ATMs with which a customer can ubiquitously, easily and conveniently withdraw cash, many of them [except the National Bank of Commerce (NBC), First National Bank (FNB) and Exim Bank Tanzania (EBT)] have not integrated the ATM service for cash deposits. Other banks like CRDB Bank that had adopted the automatic cash deposits through ATMs before, ended up abandoning the technology later.

In Tanzania, automatic cash deposits have been limited to incorporation of developments such as *Simbanking* and internet banking enabled through collaborative venture between the banks and telecommunication companies. Although this joint venture has promised for ubiquitous, easy and convenient means of cash deposits as well as withdraw through physically walking to a bank branch or through telecommunication services such as *M-Pesa*, *Tigo pesa*, *Airtel-money* and others (Chalu, 2014); all these services require the use of third part through agencies. Despite the fact that there is a great demand from the market among customers for cash deposits to be handled and completed through the ATMs; commercial banks in the country have remained reluctant in adopting the system.

In Tanzania and most other developing countries, problems like theft and robbery of properties including money are still ongoing. Staying/walking a distance with a large amount of cash money is thus uncalled-for and it is in fact very risk to the responsible individuals. Business people and entities in the country such as shops, kiosks, and others on wholesalers and retailers that are sometimes forced to keep their money in their respective business centers and/ or sometimes at home, are prone to a high risk as they wait for the next day to deposit their money into the banks. With ATMs cash deposit, a customer could simply go in a bank ATM machine and deposit his/her money any time almost ubiquitously where there is an ATM machine. According to Opoku (2015), ATMs eliminate the safety risk of carrying large amounts of money and also have the convenience of not needing to find a place to cash a check. The adoption of the automatic cash deposit service would be of added value to customers for conveniently depositing their cash after late business hours when banks operations are already closed.

Notwithstanding of all these untapped business potentials, it is not clear as to why the banks are reluctant, and why those that had adopted the services ended up abandoning it. If any, reasons have remained hear says and no research has been conducted to reveal what is the actual hindrance. Experience indicates that, in other places of the world including Africa and East Africa in particular such as Uganda, cash deposits using ATMs is reported to be successfully operating. This study seeks to clear the existing blurring situation by answering the following research questions: “*What makes some commercial banks successfully adopt cash deposits through the use of ATMs while others not?*” The study sought to assess factors influencing commercial banks’ adoption of cash deposits through ATMs in Tanzania. Specifically, the study sought to: (1) To determine the influence of system’s perceived cyber security on ATMs cash deposits adoption in Tanzania; (2) To examine the influence of perceived costs of operation on ATMs cash deposits adoption in Tanzania; and (3) To assess the available facilitating conditions and their influence on ATMs cash deposits adoption in Tanzania.

LITERATURE REVIEW

Transaction Cost Theory

The Transaction Cost Theory (TCT), developed by Ronald Coase in 1937, is the theory on firms in relation to the market. According to Wang et al. (2012), transaction costs are costs incurred in making an economic exchange, including search and information costs, bargaining costs, and policing and enforcement costs. Transaction cost theorists suggest that the total cost incurred by a firm can be grouped largely into two components which are transaction costs (costs for coordination of the work of people and machines that perform the primary processes) and production costs (costs incurred from ‘the physical or other primary processes necessary to create and distribute the goods or services being produced’) (Wang et al., 2012; Transaction Cost Economics, 2009). The theory states that every company would seek to perform its activities cheaply thus minimizing costs of service provision, a factor that would enable them earn profit and growth. Firms would always weigh cost of exchanging resources with the environment against cost of performing the activity within the firm (Aubert & Weber, 2001). For example, the introduction of ATMs cash deposits in banks has some perceived cost implications. Accordingly, firms would always weigh the costs of vending and managing special ATMs for taking deposit with benefits derived from using it. The firms will also weigh if there are any value additions, when compared with traditional way of taking deposits through bank tellers over the counters. In other words, transaction costs associated with using automatic cash deposit through ATM may be influential on whether the user is to adopt the service or not.

TCT has been used to explain a number of new technology adoption studies (Liang & Huang, 1998; Wang et al., 2012; Yigitbasioglu, 2014). In their study on determinants of user adoption of web ATMs in Bank of Taiwan, Wang et al. (2012) argued that users’ adoption and usage of Web ATM represent a kind of transaction behavior between users and banks that provide Web ATM services. According to Wang et al. (2012), users may take into consideration the transaction costs involved in bilateral exchange while deciding whether or not to adopt Web ATM systems. The TCT was also used to study the efficiency framework for understanding organizational design adoption by Roberts and Greenwood (1997); and modeling the intention to adopt cloud computing services by Yigitbasioglu (2014). The theory was considered relevant to the study in the sense that firms perceived cost to have influence to firm’s decision whether to introduce service/product or not. As such, TCT was useful for explaining commercial banks’ willingness to adopt the ATMs cash deposits. However, although the TCT is a powerful theory, it could not explain adoption of

ATMs cash deposits in its isolation. It also considered the three transaction dimensions, i.e., asset specificity, uncertainty, and frequency (Wang et al., 2012), infrastructural factor, and security factors.

Technological-Organizational-Environmental (TOE) Model

The Technological-Organizational-Environmental (TOE) model by Tornatzky et al. (1990) has three context groups: organizational, technological and external environment. Organizational context includes organization attributes such as organizational size, organization turnover, amount and quality of resources available internally, complexity of the organization's managerial structure, etc. (Shen, Hawley & Dickerson, 2004). Technological context is related to the current state of technology in the organization which is relevant for possible adoption by the organization (Chong & Ooi, 2008). They may depend on type of technology, perceived advantage that technology has and technology ease of use (Tornatzky et al., 1990). Such current state of technology can be expressed in both material (like equipment owned by the organization) and immaterial (like methods currently in use) [Masele, 2014]. External environment is an attribute related to the environment where companies conduct their businesses such as industry, market structure and characteristics including its competitors, accessibility to the resources supplied by others, external support available for adopting new technologies and government regulations (Shen et al., 2004; Chong & Ooi, 2008). These three context group elements are posited to interact with each other and influence on technology adoption decisions (Depietro et al., 1990).

As a generic theory of technology diffusion, the TOE framework is considered to be useful for studying any kind of information systems (IS) innovation research (Zhu et al., 2003) including E-banking (Liao & Shao 1999). The TOE framework has been used extensively in various IS adoption empirical works. For example, Zhu and Kraemer (2005) as well as Lin and Lin (2008) used it to study E- Business Adoption. Xu (2004) studied Internet Adoption and Masele (2014) used TOE for studying green eBusiness adoption. The mostly used constructs are quality of human resources; environmental uncertainty, government support; IS infrastructure; IS expertise; and organization compatibility (Zhu & Kraemer; 2005; Lin & Lin, 2008; Xu & Zhu, 2004). This theory was thus found useful in helping to explain the phenomenon under investigation.

Empirical Literature Review

Existing studies have identified a number of factors connected to adoption of ATMs cash deposits. Security consideration is cited by a considerable number of studies as of very significant importance. Kinuthia (2011) notes some critics concerning ATMs operators that the issue of customer security appears to have been abandoned by the banking industry. Related to security issue is an aspect of card retention. Kandie (2003) cited in Kinuthia (2011) established that the feeling of safety among customers of a bank enhanced their perception of the quality of service. The argument is in accordance with Dixit and Datta (2010) who in their e-banking study asserted that security, privacy, and trust towards the system increases acceptance level of e-banking. Devi & Malarrizhi (2010) links adoption of technology to perceived quality of services, and they connect security perception to confidence, reliability, uncertainty, and privacy. Related studies also indicate that assured confidentiality of users' information, availability (operational stability) of security system, assured integrity of the system; reliability of system security, security devices being installed; and serviceability of security system (Frank, 2014) are factors that influence the adoption of ATMs cash deposits. Related to security considerations is the availability of nearby legal entities and regulations in area (Županović et al., 2015).

The findings are also in line with Mkoka's (2014) study on the factors affecting the adoption of eBanking in Tanzania banking industry which revealed that customers feared to adopt e-banking due to the difficulties in using technology, trust, security, risk and reliability of the technology. According Mkoka (2014), most of respondents agreed that inadequacy of services offered by banks lead customers to continue using traditional distribution channel models of banking. The reviews indicated that the adopting banks such as EBT FNB, and NBC had installed their machines near the Bank's headquarters for customers' convenience and easy reference towards the new service, premises that are guarded all the times. This study, therefore, formulated its first hypothesis as:

H1. *Perceived system's security influences the adoption of ATMs automatic cash deposits.*

Studies (Županović et al., 2015; Kinuthia, 2011) indicate that in order for cash deposit ATMs to efficiently work, resources and support must be available to support the use of the intended system. These are termed as facilitating conditions and they include existence of aspects like technical infrastructure to support the use of system or service, the compatibility of the new systems with the current implementations, and the cost of implementation (Venkatesh et al., 2003; Milligan, 2007; Hillier, 2002; Lin and Lu et al., 2011). Županović et al. (2015) emphasize on presence of integral infrastructure as well as need for constant power source, placement connection with parent bank, and data line specifications. Kinuthia (2011) further argues that unless there is constant source of power there may be frequent machine downtimes, rendering the services considered unreliable and unsatisfactory. Access to ATMs including location choice determination whether being close to major roads, public transport systems and whether car parking are available or not are other key considerations (Županović et al., 2015). Županović et al. (2015) further observe that technical issues such as ATM placement (e.g. placed in door or outdoors); proper labeling of ATM, including availability – within 24/7, is vital for customers' convenience. All these factors have significant implementation to the adoption of cash deposit ATMs by the banks in question. Moreover, availability of ATMs of the same or competing bank in an area is significant, due to the fact that ATMs of competing banks in an area may have additional cost implications to demand additional inter-bank transaction costs.

The reviews with adopting banks website indicated that EBT and NBC had installed their machines near the Bank's headquarters for customers' convenience and easy reference towards the new service. Accordingly, it improved users' confidence to the systems (Exim Bank report, 2018; and Tanzania Invest, 2015). The same was with FNB. This is in line with Kinuthia (2011) who connects the ATMs adoption with factors such as machine downtimes, number of machines available in an area and withdrawal limits. This study, therefore, formulated its second hypothesis as:

H2. *Presence of facilitating conditions influences the adoption of ATMs automatic cash deposits.*

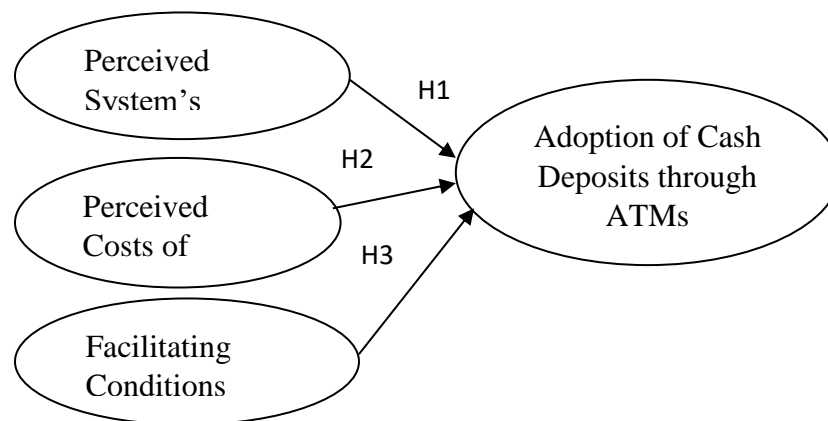
The cost implications on whether to invest or not also featured strongly in this study. By cost it may not only imply installations of the machines but also maintaining them such that they can efficiently work including ensuring that they remain secured. As Kinuthia (2011) puts it, unless cash depositing ATMs are well maintained, cases such as unavailability of machines, machine downtimes, and number of machines not working properly can end up creating chaos to users. Nonetheless, in ensuring that all these drawbacks are controlled well, there should be cost implications and whether there is willingness by top management such as bank directors and shareholders to fund the implementation of cash deposit ATMs services.

It was noted that all the adopting banks (NBC, FNB, and EBT) are clones of the big multinational based banks. According to Laudon and Laudon (2012), with multinationals the products and services on sale in different countries are adopted in countries of origins but later on adapted to suit local market conditions. Aspects like financial management and control are all from a central home base while decentralizing production, sales, and marketing operations to units are from other countries. It could be possible that, the banks NBC, EBT, and FNB are probably enjoying the initiatives and financial base coming from their central home base. The NBC bank, FNB and EBT had their cash deposit ATMs network in various places of the country including Dar es Salaam, Arusha, Mwanza and others (Exim Bank report, 2018). However, although studies argue that ATMs play an important role in enhancing the firm's competitive position, increasing their reach and lowering bank costs of operations (Abd El Aziz, and Fady, 2012), they can only do so if the ATMs are reliable. Other studies (such as Kleijnen et al., 2004; Luarn, and Lin, 2005) consider cost to affect negatively the intention to adopt the use of technology. This study thus postulated its third hypothesis that:

H3: *Perceived costs of operation influence the adoption of ATMs automatic cash deposits.*

However, the presented empirical evidences on the hypothesized factors are merely from abroad, with those from Tanzania missing. In Tanzania, not many commercial banks have adopted cash deposit systems using ATMs (Frank, 2014; Chalu, 2014). Others ended up abandoning the adoption shortly after the service commenced. This study is interested to know the reason(s) behind their abandonment of the service. So far, there is no research done in the context of Tanzania on why abandonment of the service. Conceptualizing from both theoretical and empirical literature review, this study proposes variables: 'perceived systems security,' 'perceived costs of operations', and 'facilitating conditions' as important predictors of adoption of ATMs cash deposits. The conceptual model indicating a causal-effect relationship between the hypothesized independent variables on dependent variable "Adoption of ATMs Cash Deposits" is then presented in Figure 1.

Figure 1: Conceptual Framework



Constructs of the Conceptual model

The constructs, with respective definitions, indicator items and citation sources connoting the independent variables as hypothesized predictors of the study's dependent variables are presented in Table 1.

Table 1: Constructs of the Study

Constructs	Definition	Items/Indicators	Citations
System's perceived security	... refers to the actual security system in place used by the bank to cater for all operations and transactions.	<ul style="list-style-type: none"> • Assured confidentiality of user's information • Availability (operational stability) of security system • Assured integrity of the system security • Reliability of system security • Security devices installed to ensure users safety • Serviceability of security system 	Frank (2014); Devi & Malarrizhi, 2010; Kinuthia (2011).
Perceived costs of operations	... costs incurred by the bank as investment on ATM machines' availability, existence, maintenance and operations.	<ul style="list-style-type: none"> • Perceived Cost of installation of ATMs • Perceived Cost of maintaining the ATMs • Perceived Cost and usage trade off • Perceived Cost of training users • Perceived Cost of protecting ATM cash deposit systems 	Shafinah et al. (2013); Luarn and Lin (2005); Lu et al (2011); Wang et al (2012);
Facilitating Conditions	... include, among others, enabling conditions such as infrastructures in place to foster the intended activities and operations.	<ul style="list-style-type: none"> • Location of ATM machines • Network reliability on machines • Presence of necessary infrastructure and support for the implementation of cash deposit ATMs • Presence of incentives and/or subsidies to put cost for investment in ATMs low • Supportive policies and regulations 	Milligan (2007); Hillier (2002); Lu et al. (2011)
Adoption of Cash Deposits through ATMs	... defined as the act of the commercial banks to incorporate in practice cash deposits through ATMs.	<ul style="list-style-type: none"> • Use of the service for deposit taking • Income is generated through the use of service • Customer feedback on the use of the service • Service of taking deposits is extended beyond normal working hours 	Guile and Quin (2008); Zhang et al (2012); Abdullahi Mansor and Nuhu (2015).

METHODOLOGY

This study was conducted in Dar es Salaam - the largest and highly populated city with a mixture of culture from almost every part of the country. Dar es Salaam is also a city where most of banks headquarters in the country are situated. The study made use of seven selected commercial banks which are CRDB Bank, NMB, NBC, FNB, EBT, ACB and Access Bank (T) Ltd. The selected banks have wide coverage and scope in the country and are among commercial banks which are dynamic and strive to adopt new technologies. The services include mobile banking, internet banking, and a number of other alternative channels meant to reach their customers such as establishing agents "wakala" for depositing and withdrawing near to their customers aiming at making the service convenient to customers. Therefore, deposit taking through automated teller machines would have been one of the best services to meet their customers' needs.

The study sought to establish the causal-effect relationship between the hypothesized predictor variables and outcome variables. The study constituted individual professional commercial bank employees as the unit of analysis believing that they are a group of knowledgeable and skilled individuals on the requirements of the study hence have rich information about the phenomena under investigation. A five point Likert scale questionnaires was answered by 105 respondents at the distribution of 15 respondents from each selected bank. The decision for such a sample size was adopted from Webb (1991) who asserts that for a population between 100 and 1000 the sample size must be at least ten percent (10%) of the population under investigation. The respondents were mainly from the cadres of chief officers, directors, heads of departments and managers of

departments and branches. Other sections such as Information technology (IT) department, finance department, product development and marketing were also involved in the study.

Using SPSS version 22, a multiple regression analysis was performed to show the existing relationship between study variables. The instrument was proved to be both valid and reliable. Apart from the fact that items constructing the questionnaire were from literature, a pilot study with the instrument was run before it was applied to a large scale. This ensured that the instrument was valid. A Cronbach Alpha Test to ensure that the loading of 0.7 or more was attained confirmed that the used instrument was reliable (Gulliksen, 1987). Reliability test results presented in Table 2 indicate that all the used constructs were reliable.

Table 2: Cronbach Alpha Test

Study constructs	Cronbach Alpha Values	N of Items
Perceived System Security	0.709	6
Perceived Costs of Operation	0.712	5
Facilitating Conditions	0.704	5
Adoption of Cash Deposits	0.706	4

The demographic profile as presented in Table 3, show that, gender wise, there were more male respondents (64.3%) compared to females (35.7%). The age of respondents indicates that 38.1% of respondents were aged between 31-35 years old; 34.5% aged between 36-40 years old. 20.2% were aged between 41-45, while those aged between 26-30 and 46 and above constituted 3.6% each. Education wise, majority of respondents had bachelor's degrees (46.4%), followed by master's degrees (37.5%) while advanced diploma holders constituted 17.9% of all respondents.

Table 3: Demographic profile of respondents

Selected respondents' Demographic characteristics	Distribution	Percentage (%)
Gender	Male	64.3
	Female	35.7
	Total	100.0
Age	26-30	3.6
	31-35	38.1
	36-40	34.5
	41-45	20.2
	46 and above	3.6
	Total	100
Education	Advanced Diplomas	17.9
	Bachelor's degree	46.4
	Master's degree	35.7
	Total	100.0

FINDINGS

The multiple regression analysis was performed to show the contribution of the hypothesized study predictor variables on the dependent variable. The study results in Table 4 show the overall influence of the independent variable (perceived system security, perceived cost of operation and facilitating condition) on the dependent variable. This is well elaborated using the value of R^2

which shows the explanatory power of independent variables of the hypothesized dependent variable. From the findings, it is clear that adoption of cash deposits through automated teller machines (ATMs) among commercial banks is affected by perceived systems security, perceived costs of operation and facilitating conditions by 40.2%. Furthermore, the ANOVA results indicate that the model is significant in predicting the response Adoption of Cash Deposits as the actual significant value is less than the hypothesized significant value of 0.005. In this case, perceived systems security, perceived costs of operation and facilitating conditions make a unique contribution to outcome variable adoption of cash deposits. The other remaining influence (59.8%) is attributed by other factors and concerns outside the study hypotheses.

Table 4: Multiple Regression Analysis

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	β	Std. error	Std β		
(constant)	.907	.241		3.765	.000
Perceived Systems Security	.275	.083	.366	3.309	.001
Perceived Costs of Operation	-.346	.066	.472	-4.016	.000
Facilitating Conditions	.251	.083	.254	2.126	.004
R=0.402 ; R Square= 0.390 ; Adj R Square= 0.262 ; ANOVA (F= 21.874; p= 0.000)					

a. Predictors: Perceived Systems Security, Perceived Costs of Operation and Facilitating Conditions

b. Dependent Variable: Adoption of Cash Deposits

The findings show that all three predicting variables are significant influencing at statistical level on the outcome variable. This is to say that the adoption of cash deposits using automated teller machines (ATMs) among commercial banks in Tanzania is being affected by perceived systems security, perceived costs of operations and facilitating conditions. The two variables- perceived systems security and facilitating conditions positively affect adoption of cash deposits using automated teller machines (ATMs) while perceived costs of operations have negative effects on cash deposits using automated teller machines (ATMs).

The regression model is illustrated as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e$$

Whereby:

Y = Adoption of Cash Deposits;

β_0 = Constant factor;

X_1 = Perceived Systems Security;

X_2 = Perceived Costs of Operation;

X_3 = Facilitating Conditions; and

e = Random variable;

But from multiple regression analysis (Table 4), $\beta_1=0.275$, $\beta_2=-0.346$, $\beta_3=0.251$ and $\beta_0=0.907$

In that case, the complete equation of the model is illustrated as follows:

$$Y = 0.275 X_1 - 0.346 X_2 + 0.251 X_3 + 0.907$$

DISCUSSION

The discussion is based on the three specific objectives: To determine the influence of system's perceived cyber security on adoption of cash deposit through ATMs in Tanzania; to examine the influence of costs perception on cash deposit adoption through ATMs in Tanzania; and, to assess

the available facilitating conditions and their influence on the adoption of cash deposit through ATMs in Tanzania.

Perceived Systems Security and Adoption of Cash Deposits

This study referred the term Perceived Systems Security to the actual users' protection of the system in place used by the bank to cater for all operations and transactions (Frank, 2014; Schneier, 2004; Devi & Malarrizhi, 2010; Kinuthia, 2011). It is the one that ensures reliability of services provision that maintains confidentiality while guaranteeing accountability of users and integrity of data and information (Laudon and Laudon, 2012). The study results indicated that the influence of perceived systems security on adoption of cash deposits is positively and statistically significant at $\beta = 0.275$, $t = 3.309$ and $p = 0.001$. The view corresponds with Mirondo (2018) who argues that the use of automated teller machines (ATMs) in cash deposits requires stable security systems, reliability of the service and confidentiality of user's information against cybercrimes, which are issues of concern in Tanzania. This might have been among other reasons for the abandonment of the initiative by banks like CRDB in continuing using the service.

Perception of poor security threatens customers over cybercrime threats hence making the bank loses credibility and confidence of the users in this service. For example, Rugambo (2014) suggests that cyber securities in financial institutions are still not that sufficient in several occasions thus it is not safe for certain operations to be undertaken by commercial banks including a service of cash deposits done through ATMs. The initiatives still require massive investments in cyber security to assure that clients as users of the service can safely perform such operations where their money is well safe guarded from hackers and others cyber criminals. This makes the ATMs cash deposit adoption difficult and therefore fails to comply with the rules and regulations of the Bank of Tanzania in relation to cash deposit making. It was seen in preceding sections of the literature that the EBT, FNB and NBC which had adopted the services, had installed their machines near the Banks' headquarters for customers' convenience and easy reference towards the new service (Exim Bank report, 2018), including ensuring security hence minimizing the vulnerability the ATMs and the respective depositors may be prone to. According to Laudon and Laudon (2012), businesses must protect not only its own assets but also information and resources on customers, employees and business partners to avoid costly litigation for data exposure or theft.

Perceived Costs of Operation and Adoption of Cash Deposits

This study defined the term perceived costs of operation and adoption to mean costs incurred by the bank as investment on ATM machines availability, existence, maintenance and operations (Shafinah, 2013; Lin and Lu et al., 2011; Wang et al, 2012). The study revealed that the influence of perceived costs of operation on adoption of cash deposits was negative and statistically significant at $\beta = -0.346$, $t = -4.016$ and $p = 0.000$. This implies that the adoption of cash deposits through automated teller machines (ATMs) among commercial banks in Tanzania is affected negatively by perceived costs of operations as the factor.

The claim is in line with Sotunde (2012) who stresses that a bank as a business entity strives for profit, such that if any product or service launched in the market is not profitable to cover operations costs and some marginal net profits it will hardly be adopted. Lin & Lu (2011) indicate that adoption and usage of cash deposits through automated teller machines require a lot of investments by the bank including having skilled and competent practitioners to run and guide customers on the use of the services. Besides, since this service involves technology, it requires the bank to change/updating it from time to time. Consequently, it requires the commercial banks

to incur additional costs in order to engage their employees in frequent trainings to assure that they match with the requirements. Studies (Elinaza, 2016; Sotunde, 2012) indicate that although CRDB had first adopted the cash deposits using ATM technology, it ended up abandoning it on the ground that the bank was incurring massive costs to run the service including spending funds from other units and investments to run the service. Meanwhile, the customer turnout was still very low to recoup the invested resources. In that case, since it had cost implications, most commercial banks in developing countries including Tanzania have not adopted the technology to avoid adoption and running costs including user training, security, and maintenance of the machines to ensure efficiency of the service. This fact has rendered the service considered unprofitable and has forced some banks like CRDB to withdrawal from using the services.

Banks are however urged to follow suite what their counter parts like NBC, EBT and FNB have gone through (Exim Bank report, 2018). The banks in the country have to be aggressive and spread a good number of cash deposit ATMs to various parts of the country so that they can enjoy the economies of scale. Through doing so, they will not only be able to guarantee customer satisfactions but also recoup back investment costs in the relatively short runs. According to the Tanzania Invest (2015) report, the deposit taking ATMs are fast, easy, convenient and real time.

Facilitating Conditions and Adoption of Cash Deposits

This study used the term facilitating condition to include, among others, enabling conditions such as infrastructures including ATMs networks, legal and regulatory environments in place to foster the intended cash deposit ATMs services and operations (Milligan 2007; Hillier (2002; Lu et al., 2011). The study found a positive and statistically significant influence of facilitating conditions on adoption of cash deposits at $\beta = 0.251$, $t = 2.126$ and $p = 0.004$. This means that cash deposits using automated teller machines (ATMs) among commercial banks in Tanzania is also affected by facilitating conditions in the realization of its initiatives. The views correspond with Chalu (2014) who holds that several initiatives in commercial banks have been failing in the market; for instance, cash deposits using automated teller machines (ATMs) as facilitating conditions such as network availability, network stability, convenience and others have been very poor thus discouraging users from relying on this service and therefore making them reluctant to use it. Other factors are existence of unsupportive government and policies. Consequently, customers end up neglecting the use of the services.

The findings are in line with World Economic Forum (2011) which propounds that in countries including most developing countries where technological infrastructures are poor, it is difficult to implement financial services involving cash deposits ATMs. It is also in line with what Frank (2014) indicates that adoption of cash deposits ATMs has been difficult to be well attained since availability of the services has been an issue of concern. This is due to the fact that network availability and stability level have been unreliable and characterized by several occasional machine collapses and setbacks. Hillier (2002) claims that facilitating conditions such as supportive technological infrastructure established by the government are very important in fostering some of the bank operations. Supportive technologies such as automatic cash deposits require stable networks including placement of the adequate grid systems. However, in most developing countries including Tanzania such supportive technological infrastructures are not in place thus making adoption of some of the services such as cash deposits ATMs to be implemented with difficult.

Milligan (2007) suggests that cash deposits through ATMs especially in Tanzania has been difficult to be well established and utilized among commercial bank since the location of these machines for the adopting banks has been an issue of concern. Since the machines set for this service are few in number and are located mostly outside the bank premises, their results can be inefficient usage of them. If ATMs were located near to customers' residence or businesses it would lead to avoidance of any inconveniences including forcing clients walk far distances to look for ATMs that accept cash deposits. The situation was different with the adopting banks like NBC FNB, and EBT which are all clones of the big multinational based banks. According to Laudon and Laudon (2012), with multinationals aspects like financial management and control are all from a central home base while decentralizing production, sales, and marketing operations to units are from other countries. As with multinationals, the products and services on sale in different countries are adapted to suit local market conditions. It could be possible that, the banks NBC, EBT, and FNB are probably enjoying the initiatives and financial base coming from their central home base. The NBC bank which had launched the deposit taking ATMs service on January 1, 2015 already is using the service at its various branches across Tanzania. The new network of ATMs by NBC is available in Dar es Salaam at these places Kariakoo, Kinondoni, Mlimani City and at Corporate Branches in the Dar es Salaam region (Tanzania Invest, 2011), while FNB already has a number of branches in Dar es Salaam, Arusha and other regions. The introduction of the ATMs was expected to ensure that the customers enjoyed the convenience of being able to deposit cash into their accounts through the bank's deposit taking ATMs' networks. In his speech during the launch of an FNB branch in Arusha, the FNB Chief Executive Officer, Dave Aitken, applauded, *"At FNB, we are constantly thinking of ways in which we can provide greater banking convenience to our clients."* This indicates possibilities with which banks in Tanzania can adopt cash deposit ATMs.

The EBT had oriented its customers to ensure that they are familiar with the features of the machine. Besides, as a way to improve availability and accessibility to cash deposit machines that ensures that all its esteemed customers (both corporate and retail) might employ the potential of the machines to the fullest, the NBC bank has a plan to place more cash deposit machines for both local and US dollars at various places in the country. This was meant to spare the bank's customers valuable time which would have been lost otherwise (The Guardian Reporter, 2016). The EBT had installed the machines near the Bank's headquarters for customers' convenience and easy reference towards this new service (Exim Bank report, 2018). Besides, after each deposit, the customer received a receipt printout indicating the denomination breakdown of the amount deposited and confirmation that the transaction was successfully credited to his/her account. This implies that, where the facilitating conditions are improved banks are in a good position to enhance the cash depositing ATMs usage, hence turning them profitable and competitive.

CONCLUSION AND IMPLICATIONS FOR THE STUDY

This study was formulated to assess factors that affect the adoption of cash deposit through ATMs. The hypothesized predictors of this study included the perceived systems security, perceived costs of operation and facilitating conditions. As an application of electronic facilities in commercial banks operations including cash deposits through ATMs are inevitable for not only fulfilling customers comfort to deposit their money any time through ATMs but also for the banks improving their performance through more profits, revealing what it may take for banks to adopt the service was considered important. This study observed that, with exception of NBC, FNB, and EBT

which are all clones of multinational banks, the rest of the banks had not adopted the service. This study thus has a number of practical, policy and theoretical implications.

Practically, the study established that, the commercial banks in collaboration with the government need to heavily invest in cyber security of ICT systems and information therein. Nevertheless, it is the responsibility of commercial banks to make sure that they have effective and efficient system security for the safety of their operations, including presence of stable network all the times, to assure efficiency and effectiveness in the systems use so as to foster the adoption of cash deposits using the ATMs. In doing so, it will ensure integrity, confidentiality and reliability of data and customer's money including, respective devices. In fact, cash deposit taking through ATMs frees customer walking/staying with bulk cash, thus has implications to safety of customers' lives as well as their properties.

The commercial banks in the country must sufficiently advertise their services to create massive public awareness in order to foster sufficient income generation and profits through the use and application of services. In doing so, it will save the commercial banks from incurring severe costs with insufficient returns that consequently make them to abandon the services and sometimes not even thinking about adopting the service at all.

The government should assist in facilitating the adoption of cash deposit through ATMs by improving infrastructure and formulation of appropriate policies and regulations relating to operations of the technology including strong cyber-security policy and regulation to safeguard the banks and its customers' money. This in turn will encourage both commercial banks as well as users of the service to adopt the service. It will assure that customers are well served without fear regarding safety of their information and money, while commercial banks are improving their competitive base.

From the two strong theories -TOE and TCT, in conjunction with empirical literatures, this study has drawn three important constructs (i.e. perceived systems security, perceived costs of operation and facilitating conditions) that predict commercial banks' adoption of cash deposit done using ATMs. The hypothesized variables were able to predict banks' adoption of cash deposit using ATMs by $R^2 = 39$ percent, implying that 61 percent of its variance is predicted by other factors. This is an important theoretical contribution that this study brings in. However, further research may be conducted with other multinational based banks in the country that have also not yet adopted the technology. Additionally, research should be conducted to validate the proposed model and findings within other bank contexts.

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