



## Research article

## Effects of automated teller machine service on client satisfaction in Commercial Bank of Ethiopia

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## ABSTRACT

This study was examined effects of automated teller machine (ATM) service quality on client satisfaction within the Commercial Bank of Ethiopia (CBE). During this study, the convenience sampling technique was employed. The study used primary and secondary data sources. Both quantitative and qualitative data types were collected. Data were analyzed by using five-point Likert scale and Econometric methods. Multinomial and ordered logit model was used to analyze the effect of service quality of ATM service on client satisfaction. The mean Likert scale result indicated that the respondents' attitude towards tangibles, reliability, responsiveness, assurance and empathy fall on 2.77, 2.98, 2.58, 3.02 & 3.23, respectively. The econometric result confirmed positive relationship between tangibles, reliability, responsiveness, empathy and assurance, and client satisfaction. Based on the finding of this study providing reliable network, educating customers on ATM usage, improving the security of ATM usage, increasing the number of ATMs, and increasing the amount of money withdrawn was recommended.

## 1. Introduction

ATM cards are speedy to replace dazing withdrawal machines as an accommodation way to get cash from banks (Tillya, 2013). Banks have ATM networks that help clients to get service simply and manage their accounts. Banks would obtain benefits such as reserve funds, efficacy, more noteworthy buyer inclusion, client satisfaction, and loyalty if they provide quality services through electronic managing account networks such as ATM (Al-Hawari and Ward, 2006). ATM has the advantage of transferring money from one account to another (Khan, 2010), in addition to the convenience of withdrawing money wherever the customer is located.

Client satisfaction is defined because the extent to which products/services performance matches a client's expectation (Kotler and Armstrong, 2010). It is the measure of how well products and services are ready to meet the client expectations. Client satisfaction is vital for a business success. In step with Habte and Mesfin (2019) client satisfaction is identified by a response that pertains to a specific focus and occurs at a specific time. It is directly connected to client's needs and well-known as a key influencing factor in the formation of client's future purchase intentions (Joshi, 2019). Satisfaction might be a person's feeling of pleasure or displeasure appointment resulting from comparing a product

perceived performance in relevancy to his or her expectation (Kotler and Keller, 2006). Client's level of fulfillment is determined by his or her cumulative experience at the purpose of contact with the service provider (Sureshchander et al., 2002). It depends on product and repair quality.

Service quality is one among the fundamental achievement of variables that affect the attractiveness of service providers (Auka et al., 2013). A bank can separate itself from players by giving the most effective quality service. Facility provision has a very important influence on trade execution, client fulfillment, trustworthiness, increases reference of clients, productivity and upgrades company image (Arasli et al., 2005; Baumann et al., 2007; Gilmore and McMullan, 2009; Haque, 2009; Ho and Lin, 2010; Jamal and Anastasiadou, 2009; Ladhari, 2009; McCollin et al., 2011; Rodrigues et al., 2011; Pansiri and Mmereki, 2010; Prakash and Mohanty, 2013; Saraei and Amini, 2012).

Nowadays, clients are more reluctant to acknowledge inefficient services due to the truth that they advantage of the best services, which trigger their persistently developing desires. Exceptional service quality encourages the advancement and support of long-term links with clients, which is exceptionally vital within the competitive commerce setting of banking (Boshoff and Du Plessis, 2009; Camarero, 2007).

In Ethiopia, banks offer different services. From these, Automated teller machine was widely used by clients. Commercial Bank of Ethiopia

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(CBE) is the first bank in Ethiopia to introduce ATM service for local users (CBE, 2018). However, due to lack of appropriate infrastructure and related problems, ATM failed to raise client satisfaction.

Much as there are numerous empirical studies on clients' fulfillment with ATMs in different countries but, inadequate studies has been conducted concerning quality of ATM service on client satisfaction in Ethiopia. To the knowledge of researcher, the studies conducted by (Amsalu and Dehinet, 2018; Anwar and Afework, 2017; Habte and Mesfin, 2019; Tewodros and Debela, 2019; Embiale, 2016) tried to investigate effects of ATM service on client satisfaction. Various literature revealed that customer satisfaction from computerized banking services has been done on issues related to web banking (Sintayehu, 2015). Therefore, this study attempted to investigate the effect of ATM service quality on customer satisfaction of the Commercial Bank of Ethiopia.

## 2. Methodology

### 2.1. Description of the study area

The Commercial Bank of Ethiopia (CBE) was established as the State Bank in 1942 and it was lawfully known as a share company in 1963. In 1974, CBE merged with the privately possessed known as Addis Ababa Bank, and Since then, it has been singing significant roles in the growth of the country. Commercial Bank of Ethiopia is innovator to announce modern banking to the country. It has more than 1340 subdivisions distributed across the country. It is the principal African Bank with assets of 565.5 billion birr as on June 30<sup>th</sup>, 2018. The Commercial Bank of Ethiopia (CBE) is the paramount Bank in Ethiopia to publicize ATM service for users. Presently, CBE has more than 20 million users and the figure of Mobile and Internet Banking clients also estimated more than 1,736,768 as of June 30<sup>th</sup>, 2018. The bank has ATM card users of more than 5.2 million. It has a strong connection with more than 50 famous foreign banks and a SWIFT mutual agreement with more than 700 other banks throughout the world.

### 2.2. Sampling technique, size, data types, and sources

In this study convenience sampling method was utilized since the directors of banks did not willing to give their clients' data due to a few privacy issues. The convenience sampling method included all those individuals who were clients of Commercial Bank ATM service for sample selection. The study utilized primary and secondary sources. Primary sources were collected by using a questionnaire from ATM users. Secondary sources were primarily from journals and websites to get information on the ATM service delivery and impact on client fulfillment. Both quantitative and qualitative data types were collected. Ten (10) Explanatory variables were hypothesized to affect ATM service delivery on client satisfaction. Taking explanatory variables in to consideration, the sample size was determined by rule of thumb suggested by Greene (2012);  $n \geq 50 + 8m$ ; where 'n' is sample size and 'm' is the number of explanatory variables. Thus, using this formula 168 ATM holders were interviewed. The data were collected from January to February in 2019.

### 2.3. Measuring client satisfaction

There are three dominant approaches to measure client satisfaction (Fishbein and Ajzen, 1975; Parasuraman et al., 1985; Cronin and Taylor, 1992).

1. **The Importance-performance approach:** According to this approach, customer satisfaction is a composite of the perceived importance of a range of the product/service attributes or benefits and the client's opinions about the degree to which the product or service has each attribute (Fishbein and Ajzen, 1975). When the supposed ability of the product or service is evaluated, the rank scores

are considered against the performance scores on each quality to determine the product or service strengths or weaknesses. The importance-performance approach enables the researcher to analyze whether the product or service has or performs in attributes considered important by the client. Thus, if the product/service performs in attributes considered important by the client then the product/service has more chances of satisfying the client.

2. **Expectations-performance disconfirmation** is the second dimension approach which is developed by Parasuraman et al. (1985). It depends on the proposition that the client estimates their satisfaction with a product/service by comparing pre-consumption expectations with post-consumer perceptions (performance). This is the basis for the SERVQUAL (Service Quality) measurement model by Parasuraman et al. (1988). The SERVQUAL model permits clients to rate the service on a set of general attributes presented on a Likert scale to measure their expectations and their perceptions of the performance of product/service attributes to measure customer satisfaction.
3. **Performance only** by Cronin and Taylor (1992) is the third approach to evaluate client satisfaction. This approach challenges the previous two approaches by proposing that client satisfaction is influenced by the client's insights into the ability of the product/service only. This approach discounts the importance (Fishbein and Ajzen, 1975) and client' expectations (Parasuraman et al., 1985) in the evaluation of client satisfaction. Cronin and Taylor (1992) conceptualization of this dimension approach is the foundation of the SERVPERF (Service performance) model which is a Likert scale where clients measure their supposed ability only the product/service general qualities to determine their satisfaction with the product/service.

However, both measurement approaches, SERVQUAL and SERVPERF, contribute to the conceptualization that the product/service is a package of attributes (qualities) whose performance, quality decides the level of client' satisfaction with the product/service. Therefore, this study was organized to assess the factors that influence the client's satisfaction with ATM banking using the SERVQUAL approach.

### 2.4. Conceptual framework

Different characteristics of ATM banking were adopted from empirical studies and were classified into five dimensions. The tangible aspect encompassed of number of ATMs per ATM station, ATM location, company brand presence, clear ATM slips, delivering clean notes and hygiene of ATMs and ATM stations. The reliability aspect encompasses: the range of services at ATMs, the accuracy of ATM transactions, speed of ATMs, ATMs not out of order, ATM system usability, and ease of access to ATMs. The responsiveness aspect comprised: cash availability in ATMs, quick replacement of lost ATM cards, waiting times at ATMs, fast return of swallowing ATM cards, employee speed in solving problems, and worker effectiveness in solving problems. Assurance dimension consisted: privacy at ATMs, ATM usage and ATM security advice, and security at ATM stations and finally, empathy dimension includes: employee friendliness, ATM fees, ease of ATM card application process, and employee accessibility to solve ATM issues (Al-Hawari and Ward, 2006; Tillya, 2013) (Figure 1).

### 2.5. Hypotheses

- H1. Tangible and client fulfillment has a positive relationship.
- H2. Reliability and client fulfillment have a positive relationship.
- H3. Responsiveness and client fulfillment have a positive relationship.
- H4. Assurance and client fulfillment have a positive relationship.
- H5. Empathy and client fulfillment have a positive relationship.

2.6. Data analysis

The collected Data was analyzed by utilizing a Likert scale, Descriptive, and Econometric examination. Descriptive analysis (such as percentage, mean, and standard deviation) was employed to analyze the result. A multinomial and ordered logit models were used to analyze the impact of ATM service on client satisfaction.

2.6.1. Econometric model estimation

2.6.1.1. Multinomial Logistic Model estimation. Multinomial Logistic Model (MNL) moreover assumes independence over the choices, that is, it does not permit relationship or substitution between the options. It is the foremost regularly utilized model for nominal results that are regularly utilized when a dependent variable has more than two choices. Also, the multinomial logit model has been broadly utilized by scholars. Taking after Greene (2012), the multinomial logit model takes the form:Where

$$\Pr(y = j) = \frac{e^{\beta_j x_i}}{e^{\beta_0 x_i} + e^{\beta_1 x_i} + \dots + e^{\beta_j x_i}} \quad \text{Or}$$

$$\Pr ob(y = j) = \frac{e^{\sum_{k=1}^k \beta_{jk} x_k}}}{1 + \sum_{j=1}^{J-1} e^{\sum_{k=1}^k \beta_{jk} x_k}}$$

Given  $\Pr ob(y = 1)$  where  $j = 1, 2, J - 1$

$\Pr(Y = j)$  is the probability of choosing either from the options (strongly satisfied to strongly dissatisfied categories).

$J$  is the number of selection categories (five in this case means strongly satisfied to strongly dissatisfied categories).

$X_i$  is a vector of explanatory factors conditioning the choice of the  $j$ th alternatives.  $\beta$  is a vector of the estimated parameter.

2.6.1.2. Ordered logit model estimation. The ordered logit model is recognized as the proportional odds model. This can be utilized for the variable measured on an ordinal scale, but the ordinal scale characterized crude measurement of a basic interval/ratio scale.

1. In the ordered logit model, there is a visible ordinal variable,  $Y$ .
2.  $Y$ , in turn, could be a function of another variable,  $Y^*$ , that is not measured.
  - a. In the ordered logit model, there is a continuous, unmeasured latent variable  $Y^*$ , whose values decide what the observed ordinal variable  $Y$  equals.
  - b. The continuous latent variable  $Y^*$  has a different limit focus. ( $\kappa$  is the Greek small letter Kappa.) Your value of the observed variable  $Y$  relay on whether or not you have got crossed a specific limit.
3. So, what does  $Y^*$  equal?
  - a. In the populace, the continuous latent variable  $Y^*$  is equal to

$$Y_i^* = \sum_{k=1}^K \beta_k X_{ki} + \varepsilon_i = Z_i + \varepsilon_i$$

- b. The Ordered Logit Model measures part of the above:

$$Z_i = \sum_{k=1}^K \beta_k X_{ki} = E(Y_i^*)$$

- c. Note that, because of the random disturbance term, the unmea-

sured latent variable  $Y^*$  can be either higher or lower than  $Z$ . The formulas are:-

$$P(Y_i > j) = \frac{\exp(X_i \beta - \kappa_j)}{1 + [\exp(X_i \beta - \kappa_j)]}, j = 1, 2, \dots M - 1,$$

4. Subsequently, utilizing the expected value of  $Z$  and the anticipated logistic distribution of the disturbance term, the ordered logit model can be utilized to assess the likelihood that the unobserved variable  $Y^*$  falls inside the different edge limits.

Classical model specification tests such as multicollinearity and heteroskedasticity tests were conducted to ensure that the data complied with the multilogistic regression model's assumptions. The chi-square value determines the overall importance and fitness of the logistic model. The Chi-square test is important ( $P < 0.001$ ) and it indicates that the control variable is "better" than the control without variables. Hosmer-Lemeshow test is suitable for multinomial regression model (Fager et al., 2008; Fageret and Hosmer, 2012), whereas, the Lipsitz was suitable for ordinal regression model and both tests show that the model fits reasonably well. A robust standard error has been used to minimize heteroskedasticity problems. Multicollinearity test among the explanatory variables indicated that there was no serious Multicollinearity ( $VIF < 10$ ) problem (Gujarat and Porter, 2003).

3. Results and discussions

3.1. Descriptive results

3.1.1. Demographic characteristics of the respondents

The mean age of respondents was 24.5 years which indicates that the majority of the customers are young that possess the power to work and save more money in the bank. This result is in line with the finding of Arasli et al. (2005) which revealed that the majority of the banks' customers were the youth group 20–30 years. Most of the younger people prefer to use ATM more often than older ones because older peoples prefer to use branch (Ibrahim, 2015) (Figure 2; Table 1).

To the degree level of understandability, clients were inquired to state their education level they have achieved. It was taken as a continuous variable and measured by year of schooling. According to the result of descriptive analysis, the mean education level or year of schooling was 15 years which is equivalent to degree level in the context of Ethiopia. Individuals who are uneducated as a rule discover it troublesome to use the ATM since it needs reading out orders. Education affects client loyalty and satisfaction. This finding is in line with the finding of Caruana (2002). And also it is in line with the study carried out by Khan when he stated in his findings that technical complexities and lack of knowledge are the major disadvantages of ATM usage (Khan, 2010). And also, Jeremy et al. (2018) confirmed that ATM users were typically young, being more educated, and having higher economic status.

It was observed that more educated, affluent, and younger consumers who were likely to communicate with professional information providers tended to adopt electronic banking technologies more readily than their counterparts. Most of the time Clients like university graduates or students use online banking and regularity of usage is high. Most of the primary and junior high graduates prefer to use branch or ATMs and some of the mobile banking (Ibrahim, 2015) (Figure 3).

Of the total (168) respondents, 41 respondents were female, which constitute 24% of the total respondents. The rest 75.6% of the respondents were males. Based on this finding, it can be concluded that male respondents were more dynamic in using innovations like ATM. This result is in agreement with the result of Nesrin et al. (2016). Con-

cerning the occupation of the respondents, 116 of the total respondents were in the category of not employed, which constitutes understudies, dealers, and those who were not employed within the government sectors. The rest 52 of the respondents were government employees.

This study was primarily concerned with customer satisfaction with the quality of ATM service. On average 35.7%, 25%, 21.4%, 13.7, and 4.2% of customers were Neutral, dissatisfied, strongly dissatisfied, satisfied and strongly satisfied with ATM service quality in CBE, respectively.

About 25% of the respondents were disappointed with the current status of ATM administrations whereas 21.4% of the respondents detailed as they were unequivocally opposed to this idea category which is proportionate with emphatically disappointed. The rest 17.9% of the respondents were responded that they were satisfied with the current ATM services. Therefore, starting from this result, we can judge that the current ATM services are not satisfying the customers. Most of the respondents complain that the services provided by ATM are not enough.

The result of the study showed that the majority of respondents (39%) used ATM for money withdrawal and transactions services. In addition, the respondents used ATM for transaction purposes, which is followed by the balance-checking services of the account. The Respondents indicated that they did not know the different services offered by the ATM other than withdrawal. Hence, the bank ought to center on the mindfulness creation around the other assorted organizations given by the ATM (Figure 4).

3.1.2. ATM problems in the study area

The descriptive result indicated that 98.2% of the respondents confronted issues whereas they were utilizing ATM administrations within

the Commercial bank of Ethiopia. The rest 1.8% of the respondents detailed that they did not face problems in ATM services. The kind of issues that confronted by ATM clients was a network problem, complication, shortage of money, and card retention problem (Table 2).

From the respondents, 31% of them reported that they faced Network problems, 3.6% complication of system, 10.1% deficiency of money (shortage), 3.6% card retention problem and 48.2 % faced network, limited amount of money and card retention problem whereas they were accessing the ATM.

3.1.3. Effects of SERVQUAL dimensions on customer satisfaction

There were 25 attributes of ATM banking that were adopted from empirical studies to measure customer satisfaction. These attributes were classified into five which are tangibles, reliability, responsiveness, assurance, and empathy (Table 3).

1. Tangibles

One of the features to assess customer satisfaction was tangibles which are composed of the quantity of ATMs per ATM station, convenient location, corporate brand appearance on ATMs, readable ATM slips, issuing of new notes, and cleanliness of ATMs and ATM stations. The mean value of the Likert scale of tangibles was 2.8, which falls within the category of Disagree. The factors that affect the effect of tangibles on respondents' satisfaction were the amount of ATMs/stations, location, and slips provided by the machine(Figure 5).

When we count the amount of ATMs that exist in Mizan-Aman town was six which expected to serve CBE users. There is too shortage in the quantity of ATMs in correlation with the number of users. This shortage

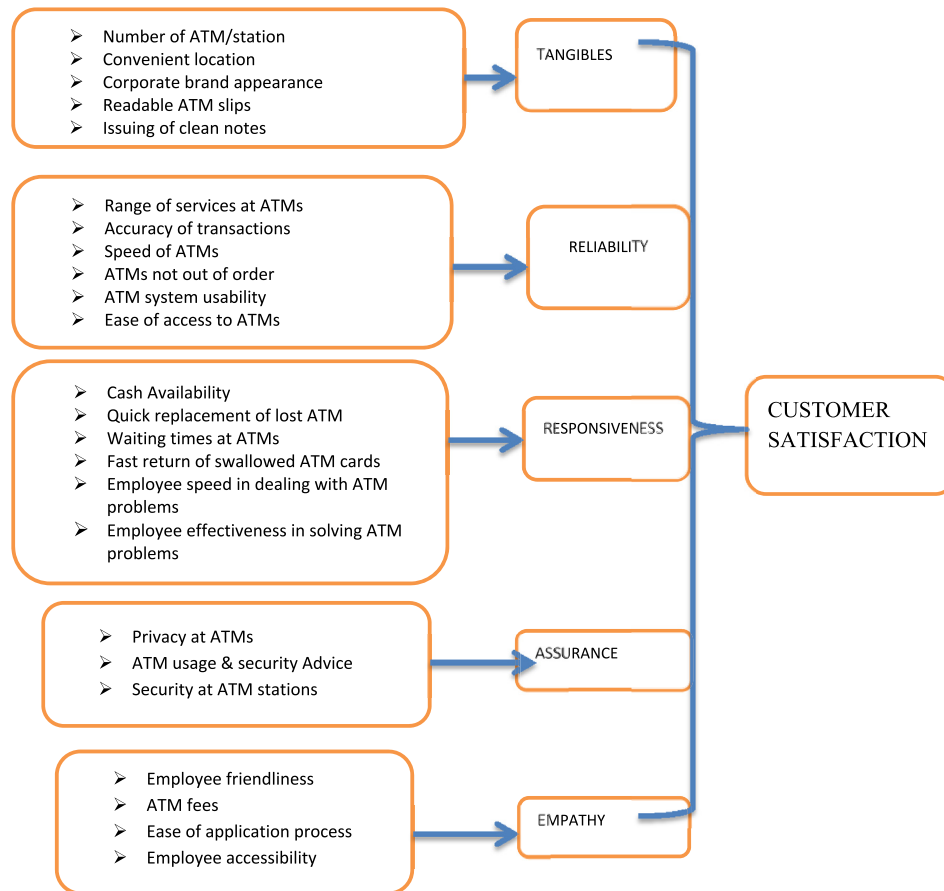


Figure 1. Conceptual framework of the study.

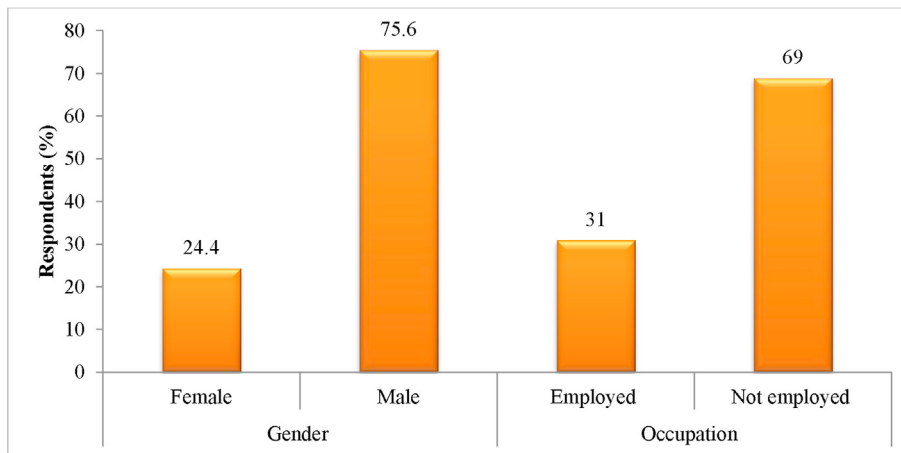


Figure 2. Gender and educational background of the respondents.

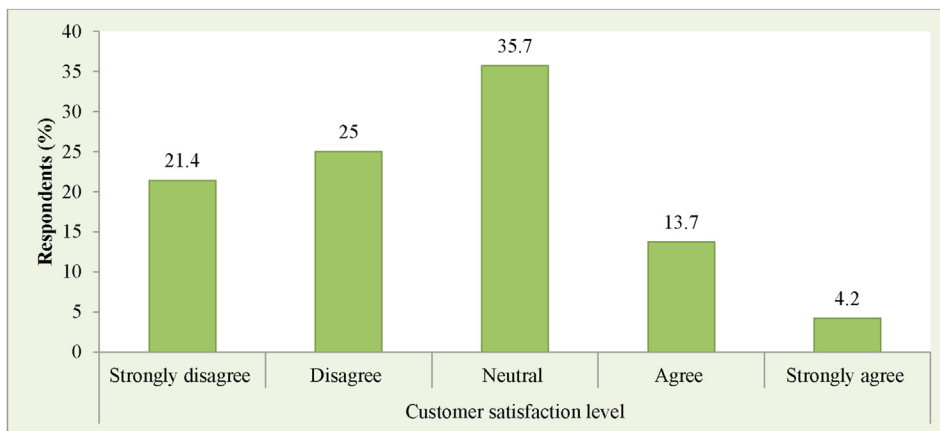


Figure 3. The satisfaction of the respondents.

increases waiting times at ATM stations to be served and decrease customer satisfaction. ATM locations were crucial to customer's satisfaction. The ATM stations in the study area were not suitable to customers, especially for the disabled group of peoples. In Mizan-Aman the ATM exists around Bank's branche offices and university only. Most of the time the ATM has not been providing slips for customers. Indeed, it needs additional tax for getting slips.

2. Reliability

To assess the effect of reliability on a customer satisfaction range of services, transaction, speed of ATM, out of order, complication, and simplicity of the system for understanding were ranked by the respondent. As it is indicated in the table below, the general attitude of respondents towards the effect of reliability on their satisfaction was found to be 2.98, meaning, neither disagree nor agree. The effect of reliability on satisfaction was influenced by ATM being out of order, range of services, and transaction accuracy. It was observed at survey time the ATMs were out of order for a long period, especially on Holidays and Sundays.

Many of the customers were disappointed by this character because it may stay for more than one day. The ATM transactions had been performed exactly, however, in the event of power cuts, the ATM stops functioning, as a result customers were not confident in using ATM and have suffered from such problems (Figure 6).

3. Responsiveness

The responsiveness angle comprised: cash availability in ATMs, the speedy substitution of lost ATM cards, waiting times at ATMs, quick return of swallowed ATM cards, worker speed in managing with ATM problems, and employee effectiveness in solving ATM problems. The result of responsiveness is 2.6, which falls under category of Disagree, which showed that customers were not satisfied with the service provided by the ATM. The factors that affect the effect of responsiveness were cash is available at any time, replacement of lost ATM cards, fast return of swallowed cards, employee speed, and effectiveness in solving ATM problems. Most of the time the ATM lacks cash. Especially on

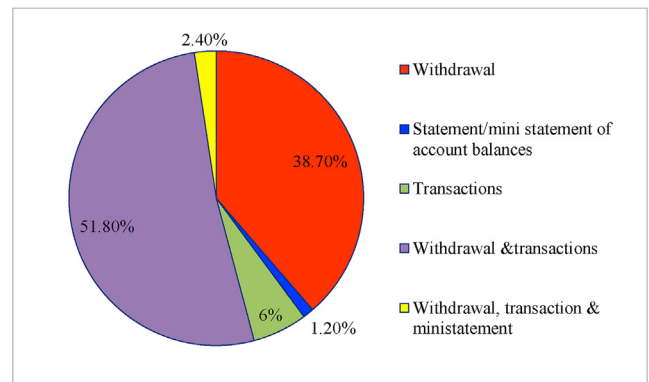


Figure 4. Services of Automated teller machine.



Figure 5. Sample of pictures that show ATM has not been providing slips. Source: Authors collection, 2019.

Holidays and Sundays, the machine does not work properly due to lack of cash in the machine. Regarding the replacement of lost ATM cards, the respondents have been forced to wait a minimum of three months and a maximum of six months. In the guideline, they are aiming to replace lost ATM cards within one month. When the machine stops its function due to maintenance problem employees tried to fix the problem but they were not effective and fast enough.

4. Assurance

Assurance dimension comprised: privacy at ATMs, ATM usage and ATM security advice, and security at ATM stations. The attitude of respondents towards the effect of Assurance on customer satisfaction was found to be 3.02 (i.e. neither satisfied nor unsatisfied). The bank services must satisfy its customers by delivering services needed by the customers. According to the result the problem that hinders the effect of assurance of customer satisfaction was lack of privacy at ATM stations and lack of ATM usage and ATM security advice (Figure 7).

5. Empathy

Empathy dimension comprised: employee friendliness, ATM fees, ease of ATM card application process, and employee accessibility to solve ATM issues. The Likert scale result for this statement is 3.23, which means it approaching to agree on category, but still customers were not satisfied. The statement that affects their satisfaction is employee availability.



Figure 6. ATM in fault/breakdown. Source: Authors collection, 2019.



Figure 7. Lack of privacy at ATM stations.

There is a lack of employee availability on Holidays and Sundays at ATM stations (see Tables 1, 2 and 3).

3.2. Econometric results

3.2.1. Result of multinomial logistic regression

Tangibles are negatively related to very dissatisfying category and significant at less than 1% significant level. The result indicated that being very dissatisfied with the ATM service was increased by lack of tangibles. Holding other explanatory variables constant, lack of tangible variables, multiplies the odds of being very dissatisfied rather than that of neutral category by 0.31 as presented in Table 4.

3.2.1.1. Reliability. Concerning this, the result indicated that a positive relationship between reliability and customer satisfaction and was significant at less than 5% significance level when compared with the base category (neutral). The odds ratio result indicated that an increase in one unit of satisfaction level in reliability variables, multiplies the odds of being satisfied rather than that of neutral category by 6.04.

3.2.1.2. Responsiveness. As it was hypothesized this variable was negatively related to customer dissatisfaction (very dissatisfaction) and significant at less than 1% significance level with very dissatisfaction. The odds ratio result indicated that lack of responsiveness will increase very dissatisfaction by odds of 0.08 and fulfillment of this variable increases customer satisfaction by a unit of 3.37 and very satisfaction by odds of 3.35.

3.2.1.3. Empathy. As the variable was hypothesized, negatively related to very dissatisfaction and also it was significant at less than 5% significance level. The odds ratio result indicated that lack of empathy increased respondents to be very dissatisfied by odds of 0.1.

3.2.2. Result of ordered logistic regression model

The model is statistically significant ( $P < 0.01$ ) as compared to the model without variables as well as empathy, assurance, responsiveness and tangibles were statistically significant (Table 5).

3.2.2.1. Empathy. As the variable was hypothesized, it is positively related to higher satisfaction at 1% significance level. The result indicated that for a one-unit increase in empathy, 1.75 will increase within the log-likelihood of being in a strongly satisfied category, given all of the other variables are held constant. The result of the odds ratio showed that as empathy increases by one unit (as it changes from 0 to 1), the odds of

**Table 1.** Age of the respondents.

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Age of the respondents	168	18	50	24.4524	5.7916

**Table 2.** Problems occurred by ATM.

	Frequency	Percent
Network	52	31.0
Complication	6	3.6
Limited amount of money	17	10.1
card retention	9	5.4
Network, Limited amount of money & card retention	81	48.2
No problem	3	1.8
Total	168	100.0

strong satisfaction is more than three times greater compared to the combined neutral, dissatisfaction, and strong dissatisfaction. Likewise, compared to strong dissatisfaction, the odds of the combined neutral and strong satisfaction are more than twice greater, keeping other variables constant.

**3.2.2.2. Responsiveness.** This variable was positively related to strong satisfaction and it was significant at less than a 5% significance level. The coefficient of the model indicated that for a one-unit increase in responsiveness, 0.74 increases in the log-likelihood of being in a strongly satisfied category, given all of the other variables are held constant. The result of the odds ratio conveys that the odds of strong satisfaction compared to the joined neutral, dissatisfaction, and strong dissatisfaction groups are two times greater for a unit increase in response, i.e. going from 0 to 1. Similarly, compared to strong dissatisfaction, the odds of the associated neutral and strong satisfaction are two times greater, *ceteris-paribus*.

**3.2.2.3. Tangibles.** The variable is positively related to strongly satisfaction and significant at less than 5% significance level. The coefficient of the model portrays that for one-unit increase intangibles, 0.78 increases in the log-likelihood of being in a strongly satisfied category, given all of the other variables are held constant. The odds ratio result revealed that for a unit increase in tangible components, i.e. going from zero to one, the odds of strong satisfaction compared with the joined neutral, dissatisfaction, and strong dissatisfaction groups are two times greater, holding other variables constant. Correspondingly, the odds of the joined neutral and strong satisfaction compared with strong dissatisfaction are two times greater, *ceteris-paribus*.

**3.2.2.4. Assurance.** The variable is positively related to strongly satisfaction and significant at 1 % significant level. The coefficient of the model reveals that for a one-unit increase in assurance, 0.94 increases in

the log-likelihood of being in a strongly satisfied category, given all of the other variables are held constant. The odds ratio result implies that for a unit increase in assurance (as it changes from 0 to 1) the odds of strong satisfaction compared with the joined neutral, dissatisfaction, and strong dissatisfaction categories are more than twice greater, holding other variables constant. Also, the odds of the joined neutral and strong satisfaction compared with strong dissatisfaction are more than two times greater, holding other variables constant.

**3.3. Challenges of customers in the usage of ATM**

The challenges that faced customers in the study area were inability to withdraw a high amount of money with the ATM, ATM cards sometimes stuck, ATM malfunctions due to internet connectivity problems, internet fraud, regular break down and frequent power outages, low knowledge in using technology facilities, PIN change problem and card lock problem, shortage of cash on the machine, lack of privacy to their information and long queues and a long time in cash dispensing.

**3.4. Discussion**

Econometric results revealed that empathy is positively associated with strong satisfaction and significant at less than a 1% significance level. In surveying the effect of service quality and client fulfillment, Naik et al. (2010), by considering of service quality (SERVQUAL) and its effect on client fulfillment, found that SERVQUAL service quality measurements (tangible factors, reliability, responsiveness, empathy, and assurance) make a positive impact on client fulfillment and thus measurements of quality of service delivery may be a crucial factor on client fulfillment. The findings of Tewodros and Debela (2019) revealed that responsiveness, efficiency, appearance, reliability and convenience of ATM have a major and positive influence on customers' satisfaction. ATM customer's level of satisfaction was positive, although, customers were not pleased with a number of ATM attributes like promptness in replacement of lost ATM cards, ATM out of order, return of swallowed ATM card, insufficient number of ATM, inaccessibility of ATM and employee to resolve ATM related issues and inconvenience of ATM locations (Habte and Mesfin, 2019). Even there are problems; surprisingly the clients do prefer to get the service through the shared ATMs, because it saves time and convenience (Anwar and Afework, 2017).

Particularly, they identified empathy as having the greatest effect on customer satisfaction. Finally, the study of Cheserek et al. (2015) on the effect of quality financial services on client fulfillment by Commercial Banks in Kenya too found that there was a positive and statistically significant relationship between empathy and client fulfillment. According to the survey result of Abhijith and Remya Vivek Menon (2018), empathy has a substantial effect on the client's satisfaction. Jabnoun and Altamimi (2003) revealed that tangibles and empathy were both significantly

**Table 3.** Service quality dimensions.

SERVQUAL dimensions	Likert scale mean	F-test	Significance
Tangibles	2.779762	4.993	0.01
Reliability	2.989087	4.108	0.03
Responsiveness	2.582341	4.202	0.03
Assurance	3.021825	8.872	0.00
Empathy	3.239583	7.926	0.00

**Table 4.** Result of multinomial logistic regression.

Variable	Very dissatisfied			Dissatisfied			Satisfied			Very satisfied		
	B	Odds Ratio	P-value	$\beta$	Odds Ratio	P-value	$\beta$	Odds Ratio	P-value	$\beta$	Odds Ratio	P-value
Gender	1.16	3.19	0.063	0.71	2.03	0.179	0.12	1.13	0.847	0.12	1.13	0
Education	-0.5	0.61	0.107	-0.09	0.91	0.603	-0.28	0.76	0.013	-0.28	0.76	0.519
Age	0.02	1.02	0.747	0.02	1.02	0.739	-0.04	0.96	0.31	-0.04	0.96	0.682
Awareness	-0.1	0.9	-0.1	-0.26	0.77	0.789	-1.78	0.17	0.012	-1.78	0.17	0
Range of Services	-1.09	0.34	0.085	-0.56	0.57	0.284	0.5	1.65	0.463	0.5	1.65	0.284
Tangibles	-1.2	0.31	0.000	-1.24	0.29	0.063	0.72	2.04	0.265	0.72	2.05	0.443
Reliability	0.95	2.59	0.215	-1.11	0.33	0.059	1.8	6.04	0.029	1.8	6.05	0.507
Responsiveness	-2.51	0.08	0.000	-0.79	0.45	0.288	1.21	3.37	0.028	1.21	3.35	0.07
Empathy	-2.26	0.1	0.013	-1.83	0.16	0.006	0.85	2.34	0.237	0.85	2.34	0.33
Assurance	-1.21	0.3	0.201	-0.75	0.47	0.228	-0.44	0.65	0.462	-0.44	0.64	0.388
Constant	7.89	2670.44	0.064	2.16	8.67	0.406	2.79	16.28	0.128	2.79	16.28	0

Multinomial logistic regression: Number of obs = 168.

Wald chi2 (40) = 6651.35.

Prob > chi2 = 0.0000.

Log pseudo likelihood = -157.93728 Pseudo R2 = 0.351.

influenced service quality at UAE Commercial Banks. Kim et al. (2016) found out that responsiveness, empathy and reliability have the largest gaps meaning the banks are performing poorly. The study conducted by Arasli et al. (2005) confirmed that responsiveness-empathy dimension constituted the largest gap between expectations and perceptions. There is a relationship between empathy and complaint behavior (Yavas et al., 1997). In the study conducted by Jamal and Anastasiadou (2009) empathy positively correlated with customer satisfaction.

Responsiveness is also positively associated with strong customer satisfaction. The finding of this study has connection with the finding of Rizwan (2013) which confirmed that responsiveness had a positive and significant effect on customer satisfaction. The result of the study that was conducted in Pakistan showed that responsiveness had a positive and significant effect on customer satisfaction (Cheserek et al., 2015). Lau et al. (2013) conducted a study to identify the interrelationships between service quality, customer satisfaction, and customer loyalty in the retail banking sector in Hong Kong. The findings of the study revealed that customer satisfaction was derived from all the dimensions of service quality including responsiveness. Responsiveness was found to be

statistically significant with customer Satisfaction. Navaratnaseelan and Elangkumaran (2014), by studying the impact of service quality on customer satisfaction with bank employees, concluded that there is a significant and positive correlation between responsiveness and customer satisfaction. The major dissatisfaction factor was slow service which is categorized in responsiveness (Lewis et al., 1994). Responsiveness is closely related to customers' satisfaction with a bank (Yavas et al., 1997). According to the findings of Lopez et al. (2007), the highest factor that affects the client's satisfaction was reliability and responsiveness. The study by Ravichandran et al. (2010) in influence of service quality of customer satisfaction application of SERVQUAL Model showed that responsiveness is the only significant dimension to influence client satisfaction.

Reliability is positively related to strong customer satisfaction. In Pakistan, Bharwana et al. (2013) also conducted a study on the impact of service quality on customers' satisfaction. Results from the study showed that there was a positive and significant relationship between reliability and customer satisfaction. Munusamy et al. (2010) also made a study of service quality delivery and its impact on customer satisfaction in the

**Table 5.** Result of the ordered logistic regression model.

	Coef.	Std. Err.	Z	P > z	[95% Conf.	Interval]	Odds ratio
Empathy	1.747031	0.392309	4.45	0.000	0.978119	2.515943	5.737542
Assurance	0.931318	0.36118	2.58	0.01	0.223419	1.639217	2.537852
Responsive	0.733926	0.3699	1.98	0.047	0.008936	1.458916	2.083244
Reliability	0.302402	0.341066	0.89	0.375	-0.36608	0.970879	1.353105
Tangibles	0.771442	0.363183	2.12	0.034	0.059617	1.483267	2.162883
Gender	0.084448	0.360333	0.23	0.815	-0.62179	0.790688	1.088116
Education	-0.01331	0.092001	-0.14	0.885	-0.19363	0.167006	0.9867752
Age	0.000693	0.028478	0.02	0.981	-0.05512	0.056509	1.000694
Awareness	0.181094	0.56202	0.32	0.747	-0.92045	1.282633	1.198528
Range of service	0.617076	0.304986	2.02	0.043	0.019315	1.214837	1.853501
/cut1	0.430726	1.432456			-2.37684	3.238288	0.430726
/cut2	2.178568	1.451922			-0.66715	5.024282	2.178568
/cut3	4.650278	1.472578			1.764079	7.536478	4.650278
/cut4	6.514702	1.516663			3.542096	9.487308	6.514702

Ordered logistic regression: Number of obs = 168.

LR chi2 (10) = 92.50.

Prob > chi2 = 0.0000.

Log likelihood = -197.18837 Pseudo R2 = 0.1900.



banking sector in Malaysia. With reliability and customer satisfaction, it was found that reliability does not have any significant impact on customer satisfaction. This was attributed to the expansion and growth of phone banking and internet banking. According to research conducted on service quality involving three banks in Accra, one of the key dimensions that affected customer satisfaction was reliability (Bonsu and Mensah, 2013). In another study on service quality and customer satisfaction on the impact of service quality on customer satisfaction and customer loyalty: evidence from Banking Sector, found that reliability yielded positive and significant correlation with client satisfaction (Khan and Fasih, 2014). Similarly, another study also found that there was a positive and statistically significant relationship between reliability and customer satisfaction (Cheserek et al., 2015). This study shows that reliability has a positive relationship with customer satisfaction (Ali, and Naem, 2019). Reliability is one of the significant determinants of quality of service in conventional banks (Jabnoun and Khalifa 2005). According to the survey result of Arasli et al. (2005) reliability had the highest impact on overall client satisfaction.

Tangible is positively related to strongly satisfaction (Munusamy et al., 2010). Additionally, Nsiah and Mensah (2014) studied the impact of service quality on client maintenance within the managing an account industry in Ghana with particular reference to Asokore provincial Bank restricted. The investigation demonstrated that tangibility plays an imperative part in client fulfillment. Concurring to an inquiry about conducting on benefit quality, including three Banks in Accra by Bonsu and Mensah (2013), there was a coordinate interface between service quality variables and client fulfillment within the keeping money industry. Navaratnaseelan and Elangkumaran (2014), by considering the effect of service quality on customer satisfaction with bank employees, concluded that there is a significant and positive correlation between service quality and customer satisfaction. The survey results of Levesques and McDougall (1996) on factors of customer satisfaction in retail banking in Canada indicated that the bank's location determines customer satisfaction. According to the findings of Kumar et al. (2009), tangibility and reliability affect customer satisfaction. The study conducted by Yap and Sweeney (2007) on Zone-of-Tolerance moderates the service quality outcome relationship in Australia showed that tangibles have a significant positive effect on loyalty, value and client satisfaction. The study of Dash et al. (2009) revealed that Indian clients attached higher importance to tangible qualities, whilst Canadian clients reflected service reliability more important. Therefore, tangibles were found to be one of the service quality dimensions that influenced customer satisfaction.

Assurance is positively related to strongly satisfaction and significant at less than 1% significant level. Tan et al. (2016) showed that a positive relationship between assurance and customer satisfaction. Zhu et al. (2002) conducted study on IT-based services and service quality in Consumer Banking and reported that IT-based services have an indirect impact on customer satisfaction specifically reliability, responsiveness & assurance have a positive impact on customer satisfaction. Responsiveness and assurance are the most prominent ones in the Banks view (Blanchard and Galloway, 1994).

Syed et al. (2014) reported that assurance, tangibility, reliability, and responsiveness affect the client's satisfaction positively. Santouridis et al. (2009) empirically investigated internet banking in Greece by examining customer satisfaction and therefore the quality of internet banking services found that the measurements of assurance, responsiveness and reliability have a significant and positive influence on client satisfaction. Nupur (2010) accomplished a study on internet banking and therefor the satisfaction level of clients in Bangladesh reported that the most dimensions assessed were reliability, empathy, responsiveness and assurance which ends in effectively satisfying the clients, whereas, the tangibles dimension does not have any link to customer satisfaction. Sadeghi and Hanzae (2010) have identified factors of client satisfaction within the usage of internet banking services in Iran. This result indicated that reliability, design of the web

site, image, accuracy, and impression of the administration of bank was found to possess a major effect on the satisfaction level of clients. Ahmad and Al-Zubi (2011) accomplished research associated with how the functionality of internet banking is expounded to the implications of client satisfaction in banks of Jordan revealed that the privacy, accessibility, design, convenience, content, and security have a big effect on the client satisfaction. From the expected variables privacy, content, and security have the foremost numerous effects on client satisfaction. Ankit (2011) has studied the factors of online banking which have an effect on client fulfillment in India and implied that the banking needs which include convenience, privacy, risk, and problem resolution are found to be the foremost important determinants which have a positive effect on client satisfaction, whereas, the existence of features and customer continuation is found to possess a very slight effect on customer satisfaction.

#### 4. Conclusion

The main aim of this study was to assess the effects of service quality delivery on customer satisfaction in CBE of Mizan – Aman Branch in the ATM services. To conduct this study, convenience sampling techniques were employed and both primary and secondary sources of data were used. The data types for the study were both quantitative and qualitative. The collected data were analyzed by using Descriptive, Likert scale, and Econometric Models. Descriptive analysis, such as percentage, mean, and standard deviation was used to analyze the result and a multinomial logit model was used to analyze the effect of ATM service on customer satisfaction.

The Likert scale result indicated that almost all respondents were not satisfied with ATM services in the study area. The effect of tangibles, reliability, and responsiveness fall under disagree category that is equivalent to the dissatisfied category. The rest of empathy and assurance fall into the category of neutral which is equivalent to neither satisfied nor dissatisfied meant till customers were not satisfied.

The econometric finding confirmed that the relationship among tangibles, reliability, responsiveness, empathy, and an assurance was positively related to customer satisfaction. Tangibles were negatively related to very dissatisfying or positively related to customer satisfaction and significant at less than 1% significant level. The result indicated that being very dissatisfied with the ATM service was affected or minimized by a lack of tangibles. It was hypothesized the result revealed a positive relationship between reliability and customer satisfaction. The econometric result showed that the variable was negatively related to dissatisfaction on ATM service. As it was hypothesized responsiveness was negatively related with customer dissatisfaction (very dissatisfaction) and that it was significant at less than 1% significance level with very dissatisfaction. As empathy was hypothesized, negatively related to dissatisfaction and also it was significant at less than 5% significance level. Policy implications based on the finding of this study are providing reliable network, educating customers on ATM usage, improving the security of ATM usage, increasing the number of ATM and pointing in the suitable location like hotels, schools, condominiums, hospitals, colleges, market places, etc., and increasing the amount of money withdrawal from the machine.

#### Declarations

##### Author contribution statement

Benyam Tadesse: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Wrote the paper.

Fayera Bakala: Conceived and designed the experiments; Contributed reagents, materials, analysis tools or data; Wrote the paper.

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### Data availability statement

Data will be made available on request.

### Declaration of interests statement

The authors declare no conflict of interest.

### Additional information

No additional information is available for this paper.

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