
**CREATING A CASH LESS SOCIETY IN ETHIOPIA, AN ILLUSION OR A
DREAM COMING TRUE IN THE NEAR FUTURE “THE CASE IN
COMMERCIAL BANK OF ETHIOPIA ADDIS ABABA BRANCHES”**

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DEPARTMENT OF ACCOUNTING AND FINANCE

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ADDIS ABABA, ETHIOPIA

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**THESIS SUBMITTED TO ADDIS ABABA UNIVERSITY COLLEGE OF
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DECLARATION

I the undersigned, declare that this thesis is my original work prepared under the guidance of Ato G/Medhin G/Hiwot. I confirm all sources of materials used for the thesis have been acknowledged and this thesis in any way has not been submitted either in part or in full to any other higher learning institution for the purpose of earning any degree.

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ABSTRACT

Cashless types of payments are rising much more rapidly in the developing markets. As a developing country, our country's case is similar with others. As our country tries to head to cashless society, the part that the government plays has a dominant role. As a state owned bank, the Ethiopian government's need to largely create users of electronic payment mechanisms is foremost inflicted in the CBE. Taking this into consideration, CBE has set an E payment vision of creating a cashless society that mostly uses electronic payment solutions by the year 2025. This being said, the researcher's main intent here is assessing if creating the needed cashless society is possibility within the time frame that the bank has set. In addition, the researcher also assessed if conditions that help for the creation of cashless society have been satisfied. In trying to get an answer to these questions, the researcher has first tried to see our country's path towards the usage of cashless payment solutions and the current status of their usage in comparison with African and close to cashless society countries. Ultimately, the researcher has tried to get an answer whether the conditions enabling the creation of cashless society like regulatory conditions, Cultural issues, technology and infrastructure factors and ultimately security issues are satisfied. In doing so the data was gathered from both primary and secondary data sources. The results showed, not functioning and poor infrastructure is pushing the creation of cashless society farther in Ethiopia. It is recommended that new technology raises new security concerns and the security part should also be thought in addition to infrastructure. Consequently, customer's attitude towards cashless payment solutions in rural areas should also be paid much attention.

Key words: Cashless society, Technology/infrastructure, Regulation, Culture/ Behavior, Security, Current Share/Trajectory, Access to Financial services

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List of Abbreviations

CBE: Commercial Bank of Ethiopia

CSM: Customer Service Manager

ATM: Automated Teller Machine

POS: Point of Sale

IQR: Inter Quartile Range

IMF: International Monetary Fund

B2B: Business to Business

B2P: Business to person

P2B: Person to Business

NBE: National Bank of Ethiopia

n.d: No Date

CNBC: Consumer News and Business Channel

Sec: Security

Reg: Regulation

Cultural: Cultural

Tech & Infra: Technological and Infrastructural

CHAPTER ONE:

INTRODUCTION

1.1. Background of the study

The importance of cash has declined in recent times. One sign of this is a long-term trend where the value of the banknotes and coins in circulation has been declining as a percentage of GDP. (Bjorn Segendorf and Anna Wilbe, 2014) It therefore follows that cash as a mode of payment is an expensive proposition for any government. (Yaquib J. et al, 2013) As a result, many governments are seeking to reduce these costs and encourage the use of non cash payment means. This scenario is what we call nowadays as cashless society. Cashless society by definition describes the economic eco system whereby financial transactions are not conducted with money in the form of physical bank notes or coins but rather through the transfer of digital information. Cashless payments in the modern context emerged in the 1970s when mag-stripe cards replaced cheques to combat cheque fraud. With the advent of the internet, electronic banking drove the migration to cashless transactions in the 1990s. By the 2010s, digital payment methods were widespread in many countries, and government driven cashless economy initiatives especially in developing countries became increasingly popular. With fewer than five percent of adults in sub Saharan Africa having credit card, and 80 percent using no formal or semi formal banking facilities, African countries recorded the lowest economic impact of electronic payments. (Anton Gaylard, 2017) Our country's case is not any different with this view.

Trends around the world indicate that paper and metal money are slowly being pushed out from the economy; and that (if the trends persist) the cashless society is on its way. (Domagoj Sajter, 2013) Contrary to the people who say cashless society is on its way, there are others who feel there is still a long way to go before going totally cashless becomes a reality in many countries. The transition from cash to cashless society could be costly in itself since countries would need the right infrastructure to support a cashless economy. (Maria Lamgan, 2016) "A cashless society to be or not to be?" is the question. And the answer is not "to be or not at any time soon anyway. The obstacles are many. Among them are, not being ready for prime time technology and old habits (of using cash) dying hard. In addition to those, there are also security privacy trust issues.

It is known cash is a leading form of payment. That is not opinion but a fact. What is opinion is the future of cash. Some of those in “the know” predict the use of cash will decrease significantly around the world in the time frames ranging from 2020 to 2050. At the extreme end of this view point, some pundits excitedly predict it will take less than 10 years for cash to disappear as a form of payment. However more moderate thinkers believe it will take much longer for the cashless society to develop, if ever. (Tom Pierce, 2016)

1.2.Statement of the Problem

Developed countries of the world to a large extent are moving away from paper payment instruments toward electronic ones specially payment cards. As we are witnessing now, cashless types of payments are rising much more rapidly in the developing markets also. For example, According to the economist, 43% of Kenyan GDP is being channeled through a mobile money platform named M pesa each year. As many other developing nations, our country’s banks have been giving cashless payment services to their customers. As a state owned bank, the Ethiopian government’s need to largely create users of electronic payment mechanisms like many other African countries is foremost inflicted in the CBE The largest bank in our country, the Commercial Bank of Ethiopia (called here after CBE) appears to be the promoter of creating a cashless society. As the CBE aspires of becoming World class commercial bank by the year 2025(GC), the one pillar that is the most important and is believed to make it World class commercial bank is the creation of a cashless society that mostly uses electronic payment mechanisms. The effort of the CBE is easily observable by seeing an ambitious plan given to all its branches in recruiting and activating cashless (digital) payment mechanisms. The payment mechanisms mainly used by the bank in pursuing this are Mobile banking, internet banking and ATM (POS) services.

As we can presume, planning for creation of a cashless payment user is one side of the coin and having it is the other side. In our country, we have previously witnessed many reforms and plans have been failing due to poor design, scrutiny and follow up. Relating to our topic, Plan about creating a cashless society is the one side and having a cashless society that mostly uses electronic payment mechanisms is the other side. In relation with this, much is not said whether this plan is achievable or not and whether the things that enable the creation of this cashless society are fulfilled. It is a loss in many ways if this plan of creating a cashless society is to fail.

The failure starts with not having a modern financial system where tax evasion and illegal activities are terminated and where they are spotted easily. Most importantly, the main failure is hindering the financial inclusivity of people that becomes through using cashless payment mechanisms. Accordingly, the researcher's main intent here is assessing if creating the needed cashless society is possibility within the time frame or 2025 GC and on whether the things that enable the creation of this society are fulfilled. In doing so the things that hinder the creation of the cashless society would be known and tackled.

1.3. Research Questions

The research questions that the researcher tried to get answer for were:

1. What does the current status and trajectory of cashless payment mechanisms in Ethiopia looks like while compared with some other African countries and with some countries thought to be closer to becoming cashless?
2. How does the readiness for creating a cashless society come into view in Ethiopia? (How ready is our country for creating a cashless society?)

1.4. Research Objectives

1.4.1. General objective:

The General objective of this research is assessing if creating cashless society that mostly uses electronic payment mechanisms can be created in the near future in Ethiopia. (Within the time frame that CBE aspires to become world class commercial bank)

1.4.2. Specific objectives

The specific objectives of this research are:

- Observing the current status and trajectory of cashless payment mechanisms in Ethiopia while compared with some African and some close to cashless society countries and as result seeing the stage that we are in and directing the pace that we shall aspire in creating cashless society.
- Observing whether Ethiopia is ready for the creation of a cashless society or not and identifying what is hindering us from this creation.

1.5. Significance of the Study

This research's results show the areas in a good and bad course towards creating a cashless society. Hence, the areas in bad route would be known by all stakeholders and measures be taken on issues which are hindering the creation of cashless society. In relation to the good courses, all stakeholders would be able to strengthen them. The research would also be used as a reference for other researchers who need to commence their research with the same or related topic. The research will also be used for showing where Ethiopia is standing while compared with other African countries and with close to cashless society countries. In doing so, all stakeholders will be able to see the pace that they shall oversee if creating a cashless society is what they aim.

1.6.Scope and Limitation of the Study

1.6.1. Scope

There are lots of means for creating a cashless society. For example, one can write a cheque and deposit it to another person's account in settlement of a payment. Then the beneficiary of the payment can also write his cheque and pay for another person by depositing through his cheque. Here for example there is no such a thing as the availability of physical money. Similar to this, there can also be other ways of payment on which physical cash is not observable. Hence, the research here only focused on the payment systems; Internet banking, Mobile Banking, ATM and POS (point of sale). The rationale behind this is since the main premises in our country towards the creation of a cashless society are intertwined with these payment mechanisms.

As it is inferred from this research's topic, it is conducted only in Commercial bank of Ethiopia Addis Ababa Branches. Here, it shall not be forgotten that the results can be inferred to other cities of our country. However, when the route of Ethiopia is being compared with other African and close to cashless society countries, the data gathered is not limited on Commercial bank of Ethiopia. Hence, overview of our entire country's cashless society journey was seen.

When we come to mobile payments, there are two widely used payment mechanisms through cell phones. These are mobile money and mobile banking. Mobile money represents money transfer and payment services offered and conducted via cell phone. Its Service can be offered by a telecom or a bank and generally offers a limited range of financial services. Mobile banking on the other hand stands for accessing and utilizing a bank account via mobile application on a cell phone. It is offered by banks and generally offers full range of banking services. (I Veri white paper, 2014) Hence, the researcher focused on both mobile money and mobile banking.

1.6.2. Limitation

The one limitation that the researcher saw was the availability of data while the Ethiopian cashless journey was being compared with other African and other close to cashless society countries. This made the researcher not to make the comparison so easily. Consequently, the researcher tried to tackle this by making it free for any country to be included in the comparison. The other limitation that the researcher encountered was not finding many researches that were done in Ethiopia towards a cashless society. This was well dealt with plenty of researches that were done on the means of becoming cashless and with researches that were done in other countries.

1.7.Operational Definition

Here, it shall be known that there are two definitions for what a cashless society mean. The first describes cashless society as a term relating to the economic eco-system in which palpable, physical money, namely paper banknotes and metal coins, are replaced with virtual, digital money, and where cash circulation is substituted with payments done by using numerous types of cards (credit, debit, pre-paid, contactless), mobile devices (cell phones, tablets, and similar), and various other equipments connected to the internet (from desktop PCs to smart refrigerators.) For our purpose, the term that we used was the second definition by prime minister of India Narendra Modi. He was quoted once saying “Our dream is that there should be cashless society. This is correct that 100% cashless society is never possible. But we can make a start with less-cash society- then cashless society will not be a far off destination,”. (Aman Sharma, 2016) Hence, our operational definition was less cash society like Narendra Modi mentioned rather

than abolishing cash 100% as legal tender. Therefore, cashless society can be foreseen as the final point of a steady sequence of small steps, of whom many steps have already been undertaken. (Domagoj Sajter, 2013) Hence the main point is not the final point at the top “cashless society” but the steps that are been taken.

1.8. Structure of the Paper

The research is organized in five chapters as follows:

Chapter-1:- Introduction:- The first chapter constitutes background of the study, statement of the problem, objective of the study, research questions, scope, limitation and significance of study, and finally operational definition.

Chapter-2:- Literature Review: - The second chapter presents previous related researches done on the topic of cashless society. This constitutes Empirical and Theoretical Literature review.

Chapter-3:- Research Methodology: - The third chapter explains the methodology used in commencing the research. This includes, overview of the whole methodology, types and sources of data, sampling techniques, method used to determine the sample size, tools for the collection of data and ultimately method of data analysis.

Chapter-4:- Data Presentation and Analysis: - The fourth chapter presents the analysis and results of the study.

Chapter-5:- Summary, Conclusion and Recommendation: - Ultimately, the last chapter presents summary of major findings, conclusion and recommendation of the study.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Theoretical Literature Review

2.1.1 Cashless Society

By definition Cashless society is a term describing the economic eco-system in which palpable, physical money, namely paper banknotes and metal coins, are replaced with virtual, digital money, and where cash circulation is substituted with payments done using numerous types of cards (credit, debit, pre-paid, contactless), mobile devices (cell phones, tablets, and similar), and various other equipment connected to the internet (from desktop PCs to smart refrigerators).

Even though Hollow (2012) considers cashless society as a concept dated to pre-1900s, utopian thinkers (e.g. Thomas More) envisaged a society without money altogether, whereas ‘cashless society’ describes a civilization holding money, but without its most distinctive material representation – cash. Having in mind this particular distinction between money and cash, the term ‘cashless society’ originated in the 1960s. (Domagoj Sajter, 2013)

2.1.2 Resistance and Support towards Cashless Society

There are both challengers and promoters for the concept of cashless society. There are plenty of reasons that those challengers and promoters of the cashless society raise for backing up their argument. Below, we will first try to see the ideas of some challengers and then see some ideas of the supporters.

2.1.2.1 Resistance towards cashless society

As Domagoj Sajter pointed out, Cashless society is marketed and promoted intensely by the parties interested in its emergence; most often disregarding (deliberately, or inadvertently – whichever is the case) its negative effects on the society as a whole, and overstating the positives. “While there are some positive aspects to a cashless society, such as eradicating counterfeiters, suppressing illegal markets, and curbing tax evasion, its negative effects on the society as a whole are mostly disregarded.” What Domagoj was mentioning can in other words mean that there are various negative aspects not mentioned by parties interested in the emergence

of a cashless society. These negative effects that Domagoj mentioned have been explained in the following way. For example, “when a person (or company) pays something with cash, she/he needs no intermediary to fulfill her/his needs; she/he is directly in charge of her/his property, and free to interact with other market participants. However, if payments can be done only and exclusively via some type of electronic system, then the market processes become obscured by interpolation of a third party which can impose various limitations on transactions.”

As we might guess, “Cash means direct interchange, market without borders and autonomy of participants. On the other hand cashless transactions can arise only if prerequisites of third parties are taken into consideration. Transaction must be in the interest of the intermediary as well; otherwise it might not fulfill the necessary preconditions.” Hence, supporting cashless society and Prohibiting cash transactions disallows the market to operate to its full extension.” (Domagoj Sajter, 2013)

When we come to his another argument against cashless society, when market participants pay with cash, banks gain nothing from it. In a cashless society, transaction fees would be imposed (probably not in the first stage, to attract the volume), which would practically represent a tax on every single payment, and which would benefit only the intermediaries. This would result in an increase in transaction costs and generally reduction in economic activity.

Another disadvantage of cashless society is political dynamics of democracy could fundamentally be disrupted: taking money away from citizens (and companies) takes away their power as well. Advanced technology could disable funding of mass actions, extensive protests and large-scale civil disobediences, all of which are important traits of democratic processes.

It is also argued that cash must be kept since it guarantees integrity for persons, reduces segregation in a society and smaller companies and people in rural areas are dependent on cash. Hence, the payment system would be more vulnerable if cash disappears and electronic money tends to increase debt and poor financial control by consumers. (Central Bank of Nigeria, 2015)

Ultimately opponents to cashless society feel Cash as a symbol of economic freedom. Cashless society demands constant power supply, non-stop internet connection, 24/7 customer service, continuous updating of protection systems against all kinds of malware, alternate servers on backup locations (again with constant power supply and internet connection), sophisticated

surveillance and monitoring, legion of engineers on stand-by, etc (Yaqub J O.et al, 2013) Hence, providing security in a cash economy is relatively simple and inexpensive when compared with possible shortcomings of the above requirements.

Review of some of the arguments against a cashless society:

Cash is the most efficient payment method for low-value payments and many people do not want all payments to be traced. In relation with this, not all people will be able to access and use cashless payments (what will happen to homeless people, temporary immigrants, those without bank accounts?) In addition to this, there are questions whether crime will be reduced or increased if cash disappears? Some say it will increase. Ultimately, cashless society will create unemployment since some of the cash-related jobs will disappear and a 100 percent electronic payment system (including mobile payment services) may be vulnerable. What if a system for electricity and/or Internet breaks? (Central Bank of Nigeria, 2015)

2.1.2.2 Support towards cashless society

As there are people that are opposed to cashless society, there are also people, who prefer to use modern technological advancements as their payment mechanism. They base their argument through raising the following issues.

“It has nowadays become clear cash is on an inexorable downward trajectory. Plus, and perhaps the most damning blow for cash is, it’s actually costing businesses, through storing, transferring and accounting fees. In relation with this, people tend to be familiar with these costs and they want to minimize them.”

On the other hand, as we might presume, Cashless payments can be traced, since all electronic and mobile payments leave digital trails. Therefore, it is argued that underground economy (illegal trading of weapons and drugs, prostitution, tax evasion, and other black market activities), operations of diverse criminal groups and terrorists could be restrained, possibly in some regions even eliminated. Identity of the transaction parties could be revealed, and with it anonymity and privacy of the participants would be lost. This would lead to more effective law enforcement. (Domagoj Sajter, 2013)

On the other hand, efficient and secure payment system enables the monetary policies of the government to reach the economy easily and foster investment growth and national saving. (Simret Zewdie, 2013)

Other challenges resulting from high-cash usage among others include; robberies and cash-related crime, revenue leakage arising from too much of cash handling, inefficient treasury management due to nature of cash processing, high subsidy and high informal sector. (Yaqub J. et al, 2013) Thus, it is argued that the effect of these scenarios can be minimized or even eliminated if cashless society is brought in.

While the high level of cash transactions creates an opportunity for the electronic payment industry, it also imposes a cost on local economies. Cash has to be minted, securely transported, counted and reconciled, kept secure and maintained for re-use time and time again. The per-payment cost in cash is high, and will always remain high; whereas, costs of electronic system are fixed. Once the infrastructure has been built, the costs per-transaction is very low.

Hord (2005) further emphasizes the fact that electronic payment lowers costs for businesses. The more payment that is processed electronically, the less money is spent on paper and postage. Offering electronic payment can also help businesses improve customer retention. —A customer is more likely to return to the same e-commerce site where his or her information has already been entered and stored. Despite its numerous benefits, it must not be forgotten that Cashless policy, comes with its own challenges even in the developed world. Yaqub J. O, et al (2013) citing Hord (2005)

The other thing is, when cardholders use their cards at the point of sale they are helping to keep money in the banking system. As a result, Electronic Payment System can help displace shadow economies, bring hidden transactions into the banking system and increase transparency, confidence and participation in the financial system. Yaqub J. O, et al (2013) citing Cobb, (2005) The following are some of the negative consequences associated with the high usage of physical cash in an economy,

High cost of cash: There is a high cost of cash along the value chain - banks, to corporations and traders; everyone bears the high costs associated with the volume of cash handling.

High risk of using cash: Cash encourages robberies and other cash-related crimes. It also can lead to financial loss in the case of fire and flooding incidents.

High subsidy: the entire banking population subsidizes the costs in terms of high cash usage.

Informal Economy: High cash usage results in a lot of money outside the formal economy, thus limiting the effectiveness of monetary policy in managing inflation and encouraging economic growth.

Inefficiency & Corruption: High cash usage enables corruption, leakages and money laundering, amongst other cash-related fraudulent activities. Yaqub J. O, et al (2013)

The above things being said about challengers and promoters of cashless society, the ultimate goal for both is encouraging the development of a payment system that is secure, convenient, and affordable. Both cash and non-cash payment systems have their distinctive advantages and disadvantages; neither extreme is good (*all things in moderation*). Going cashless opens vast array of new possibilities, never previously experienced in modern society, which also bear risks never experienced before, and in many ways resembles opening Pandora's box; so often in life we learn to cherish and value certain phenomena only after they are gone. (Domagoj Sajter, 2013)

2.1.3 Payment system in Ethiopia

Modern banking in Ethiopia is believed to be introduced in 1905. It was in 1905 that the first bank, the “Bank of Abyssinia”, was established based on the agreement signed between the Ethiopian government and the national bank of Egypt, which was owned by the British. (Fasil and Merhatbeb 2012).

Ethiopia is still an under banked country and a lot needs to be done in the banking sector to mobilize resources and assure sustainable development. There is a big gap between the banking service coverage and the banking service demand by the society. Ayenew and Fekade (n.d)

In relation with this, the Ethiopian banking sector also lagged behind in terms of introducing modern banking system such as Electronic Funds Transfer and use of modern payment instruments. (Simret Zewdie, 2013)

Despite a rapid increase in the number of financial institutions since financial liberalization, the Ethiopian banking system is still believed to be underdeveloped compared to the rest of the world. Cash is still the most dominant medium of exchange. Even if we can witness improvements in the last few years, commercial banks in Ethiopia provide the same kind of service with the same operational style. Their customers have missed to enjoy the technological advancement in banking sector which has been entertained elsewhere in Africa and the rest of the world. (Gardachew Werku, 2010)

In Ethiopia it is sometimes impossible to withdraw money without presenting the pass book and money transfer takes time if it is not between branches of the same bank. However, from the public and the economy, there is a strong need for strengthening linkages among banks in order to allow healthy flow of financial resources among financial institutions and optimize the contributions of the entire financial system to the development processes as whole. (Gardachew Werku, 2010)

In the last few years however, banks are finally making a leap to catch up with innovative banking services and products. One can easily observe that the home grown banks are introducing a new range of banking services based on ATM, Internet Banking, Mobile Banking,

POS, SMS and Call Center banking as an extension of their traditional branch services. This truly heralds a new area of banking in Ethiopia. (Aychiluhim Desisa and Tibebe Beshah, n.d)

The first modern banking service of withdrawing cash from Automated Teller Machines (hereinafter “ATM”) in Ethiopia was introduced by Commercial Bank of Ethiopia (hereinafter “CBE”) in 2001. Afterwards, Ethiopian banks have joined VISA membership that enables them to issue VISA card to their customers. Like most African countries, the payment card that is used in Ethiopia is however still Debit card. Practically speaking, most developing countries never acquired the credit card habit because they lack the credit information and reporting systems necessary to support credit cards. Relatively, few of their citizens have sufficient demonstrable income to qualify for credit. Hence, as the “Plastic Revolution” takes hold in developing countries, it is not credit cards but debit and prepaid cards that are beginning to transform the cash economies in places like China, Brazil and southern Africa. Ethiopia is not an exception here. Credit is limited to investments and in some cases to housing projects and is highly regulated by the government. Henceforth, it suffices to state at this point that introduction of credit card as a payment instrument in Ethiopia is far from being reality. Having this in mind, it is no surprise that Ethiopian banks are currently issuing only debit electron cards. Nonetheless, even if it has been 16 years since the introduction of the first ATM, cash remains the most dominant medium of exchange while the household bank coverage of Ethiopia is still low. It is believed to be convenient to carry and use a card rather than a large amount of cash. For household bank coverage it is argued that modern payment system whereby funds are transferred electronically is a key factor to extend banking services to the majority of unbanked Ethiopians. This is principally because financial institutions do not need to open offices and invest heavily in order to provide a banking service. (Simret Zewdie, 2013)

This being said, there are things that are raised by stakeholders that the Ethiopian Payment system is lagging behind due to Low level of internet penetration and poorly developed telecommunication infrastructure. In addition to this, Lack of infrastructure for telecommunications, Internet and online payments impede smooth development and improvements in e-payment in Ethiopia. Like many other African countries, there is also major Resistance to changes in technology among customers due to Lack of awareness on the benefits

of new technologies, Fear of risk, Lack of trained personnel in key organizations, and Tendency to be content with the existing structures, (Yaqub J. O,et al 2013)

2.1.4 Ethiopia and its Means of creating cashless society

There are many electronic banking delivery channels to provide banking service to customers. Among them ATM, POS, mobile banking and internet banking are currently and mainly being used in our country. Below, we will try to see brief introduction about these channels.

2.1.4.1 Internet banking

One popular application of the World Wide Web is Internet banking. Internet banking allows customers of a financial institution to conduct financial transactions on a secure website operated by the institution, which can be a retail or virtual bank, credit union or society. It may include any transaction related to online usage. Banks increasingly operate websites through which customers are able not only to inquire about account balances, interest and exchange rates but also to conduct a range of transactions. A major driving force behind the rapid spread of Internet Banking (IB) worldwide is its acceptance as an extremely cost effective delivery channel of banking service as compared to other existing channels. However, Internet is not an unmixed blessing to the banking sector. Along with reduction in cost of transactions, it has also brought new orientation to risks and even new forms of risks to which banks conducting Internet banking expose themselves.

Regulators and supervisors worldwide are concerned that while banks remain efficient and cost effective, they must be conscious of different types of risks that this form of banking entails. They must also have systems in place to manage the same. As we might deem, Technology based banking is now bringing more choices than ever before in the financial sector. It is now becoming possible to access our bank account in multiple ways and take care of our financial affairs quickly and efficiently. Banks have thrived with the explosive growth and availability of the Internet. A wide variety of services are offered to the customers. Paying a bill, checking the account balance, or applying for a loan can now be comfortably done from one's own home or office through internet banking. (Aychiluhim Desisa and Tibebe Beshah, n.d)

2.1.4.2 Mobile banking

Mobile banking (also known as M-banking, m banking) is a term used for performing balance checks, account transactions, payments, credit applications and other banking transactions through a mobile device such as a mobile phone or Personal Digital Assistant (PDA). The earliest mobile banking services were offered over SMS, a service known as SMS banking.

Mobile banking is used in many parts of the world with little or no infrastructure, especially remote and rural areas. This aspect of mobile commerce is also popular in countries where most of their population is un-banked. In most of these places, banks can only be found in big cities, and customers have to travel hundreds of miles to the nearest bank. The scope of offered services may include facilities to conduct bank and stock market transactions, to administer accounts and to access customized information. (Worku et, el, 2016)

Mobile payments are a small but growing subset of the broader world of electronic payments PDA. Mobile banking is a subset of e-banking in which customers access a range of banking products like savings accounts and credit instruments, via electronic channels. M banking requires the customer to hold a deposit account to and from which payments or transfers may be made. M banking reduces the transactions costs of payments because there is an electronically accessible store of value. A major benefit of M banking is drawing in the “unbanked” who generally can’t afford the cost of formal banking services and infrastructure. There is the potential to bank people outside the realm of traditional financial services and the mobile phone is a pervasive device that has fewer barriers to entry than most technologies and has penetrated some of the poorest economies due to the overwhelming demand for any form of telecommunications . (USAID KSC,2007)

Although mobile phone penetration is better than the conventional banking service for reaching the unbanked in developing countries, there is a challenge of using mobile banking applications easily by the poor. For instance, it goes without saying that a mobile banking application shall be secure, scalable, available and responsive. Interoperability is also found to be important as there will be interbank transactions that deal with heterogeneous environments. (Ayenew and Fekade, n.d,)

2.1.4.3 ATM (Automated Teller Machine)

Automated Teller Machine (ATM) is a machine where cash withdrawal can be made over the machine without going in to the banking hall. It also sells recharge cards and transfer funds; it can be accessed 24 hours/7 days with account balance enquiry. (Worku et. El, 2016)

ATM card on the other hand is a kind of plastic card which allows a cardholder to withdraw money from his bank account through automated teller machine. This card can also be used for other banking services like deposit and transfer to any other account by using the ATM machine.

There are two types of payment cards that are widely used throughout the world. These are Debit cards and Credit cards. Debit cards are electronic plastic cards directly tied to bank account and the amount of money the cardholder can spend with it is limited to the amount of money he/she has in the bank. It is called debit card because when cardholder uses a debit card, the transaction debits (withdraws) the amount of the transaction from cardholders' account, usually on the same day. Credit card on the other hand is a modern electronic plastic card that may be used repeatedly to borrow money or buy products and services on credit. VISA, Master Card, American Express and Discover are commonly known and widely used credit cards throughout the world. Like most African countries, the payment card that is used in Ethiopia is however still Debit card. Practically speaking, most developing countries never acquired the credit card habit because they lack the credit information and reporting systems necessary to support credit cards. Relatively, few of their citizens have sufficient demonstrable income to qualify for credit. (Simret Zewdie, 2013)

E-cards have many Benefits. According to C.S.V Murthy, (2004), E-cards offer a number of benefits to the issuing banks and customers of the bank. This includes, dramatically reducing printing, mailing, and financial handling costs associated with processing transaction, Enhancing payment security by minimizing theft or loss, reducing undeliverable payments via electronic delivery to the card account and Preventing fraud through automated controls. In addition to this, they Increase customer satisfaction and enhance service to constituents, Ensure continuity of service to cardholders in emergency or disaster situations and Improve operational efficiency and profitability of the issuing banks. (Gardachew Werku, 2010)

2.1.4.4 POS: (Point of sale)

PoS or swipe machine as it is popularly known is a technological instrument provided to a merchant establishment to carry out the sale of goods or services to customers in a cashless environment. All the customer has to do is swipe his or her debit, credit or pre paid card. Point of sale (POS) also sometimes referred to as point of purchase (POP) or checkout is the location where a transaction occurs. A 'checkout' refers to a POS terminal or more generally to the hardware and software used for checkouts, the equivalent of an electronic cash register. A POS terminal manages the selling process by a salesperson accessible interface. The same system allows the creation and printing of the receipt. POS systems record sales for business and tax purposes. Illegal software dubbed 'zappers' is increasingly used on them to falsify these records with a view to evading the payment of taxes. (Worku et. El, 2016)

2.2.Empirical literature review

2.2.1 General Concept of Cashless Society

Bank customers' taste and desire now a day have begun to raise the stakes of expectation of exceptional services. Customers now want to transact their banking transactions at any time and location convenient for their life style. This is why the world banking industry is entering into new phenomena of unprecedented form of competition supported by modern information and communication infrastructure. (Gardachew Werku, 2010)

Like most other markets, the banking industry is experiencing technological advancements since new methods of payment are arising and the need for the old ones perhaps is declining. There are numerous indications that this development of introduction of modern payment system will continue. Due to these modern payment methods' introduction, there is no doubt that the importance of cash has declined in comparison to that of electronic payments. One sign of this is a long-term trend where the value of banknotes and coins in circulation is declining as a percentage of GDP. This development will probably mean that it will become increasingly difficult to gain access to and pay in cash in the future. This is the term that we are referring now a day as cashless payment system. (Björn Segendorf and Anna Wilbe 2014)

Whilst previously being just another futuristic vision, the cashless society is imagination no more; it is being gradually introduced throughout the world. It is a fact that such substantial shift could never be performed overnight; therefore the cashless society can be foreseen as the final point of a steady sequence of small steps, of whom many have already been undertaken, as cash is gradually being expelled from the modern society. (Domagoj Sajter, 2013)

Examples of this shift from cash to "non cash" can be found in many places; for example, the US state of Louisiana passed an Act in 2011 which completely outlaws the use of cash in transactions for secondhand goods; in December 2011 Italian citizens lost the right to conduct transactions of over €1,000 in cash, while few months later (April 2012) cash payments were banned in Spain as well, albeit with somewhat higher cap: €2,500. (Domagoj Sajter, 2013)

This Cashless society concept, in which paper money and coins are replaced with virtual money, embodied in RFID, NFC and other electronic chips, or located in the ‘cloud’, is believed to be a fiction no more; it is nearby, and in some countries on the verge of full manifestation. This phenomena of cashless society is not restricted to the highly-developed, western societies; quite the opposite, cashless types of payments are rising much more rapidly in the developing markets, where the pace of growth is three times as higher as in the developed world. Remarkable story of M-Pesa in Kenya is a good example: this SMS-based money transfer system that allows individuals to deposit, send, and withdraw funds using their cell phone reached approx. 65 % of Kenyan households by the end of 2009. (Jack and Suri, 2011)

According to the Central Bank of Kenya, the number of cards in circulation increased more than tenfold in the period 2005-2012; from 995 thousands to 9.9 million. This being said, Trends indicate that paper and metal money are slowly being pushed out from the economy; and that (if the trends persist) the cashless society is on its way. (Domagoj Sajter, 2013)

Contrary to the people who say cashless society is on its way, there are others who feel there is still a long way to go before going totally cashless becomes a reality in many countries. Maria Lamgan (2016) for example mentions the transition from cash to cashless society could be costly in itself since countries would need the right infrastructure to support a cashless economy.

As Tom Pierce 2016 also stated, “A cashless society to be or not to be?” is the question. And the answer is not “to be or not at any time soon anyway. The obstacles are many. Among them are, not being ready for prime time technology and old habits (of using cash) dying hard. In addition to those, there are also security privacy trust issues.

It is known cash is a leading form of payment. That is not opinion but a fact. What is opinion is the future of cash. Some of those in “the know” predict the use of cash will decrease significantly around the world in the time frames ranging from 2020 to 2050. At the extreme end of this view point, some pundits excitedly predict it will take less than 10 years for cash to disappear as a form of payment. However more moderate thinkers believe it will take much longer for the cashless society to develop, if ever. (Tom Pierce, 2016)

In continuation to his analysis, Pierce mentioned the under mentioned major obstacles are slowing, if not stopping outright, the arrival of cashless society. These obstacles include the questionable reliability of digital payment tools, trust issues around security (privacy) and habitual human behavior challenges.

Leaving these thoughts aside and given the objective of promoting a safe and efficient payment system, a number of questions need to be investigated before the unique status of cash is abolished and cashless society becomes reality. Hence, these are some Critical Challenges or concerns on the Route towards a Cashless Society. To mention a few of these questions that can become critical Challenges or concerns on the Route towards a Cashless Society,

- Creating reliability and trust in new services that substitute cash.
- Making sure laws, regulations, public procurement, governmental support etc. lead to open and competitive markets.
- To have transparent plans and ideas for how societal gains from an improved payment system are shared and invested
- To engage consumers in the change process. (Central Bank of Nigeria, 2015)

In addition to these, online privacy is for example a top concern for most Americans in creation of cashless society. Chris Weller (2016) On the other hand, contrary to the American concern for privacy, this online privacy concern is not a worrying fact for Swedish people. Sweden already lives in the future and only 2% of its transactions are still done in cash. In Sweden, going cashless isn't a big deal because people largely trust their government and one another. They do not worry about their privacy. Contrary to the Sweden case, In the US, online privacy concerns make people much more fearful about what happens to their money once it is digital. Hence, the mind set in different societies about cashless society security issues is diverse.

Continuing with the security issue, in many occasions, the argument often heard in promotion of the cashless society is its increased security. It is said that, when there is no money there is no object of theft, which should lessen the level of criminal activity. Hence, the absolute transferability of ownership of paper money is recommended to be substituted with limited

usability of digital money, which can be utilized only after successful completion of certain authorization processes.

As an example, there were only five bank robberies in Sweden in 2012, which was a substantial decline from past years (110 in 2008, 16 in 2011), a drop which was attributed to Sweden's shift towards cashless society. However, computer frauds and frauds performed through the internet in Sweden for example were rising constantly (+12% and +43%, respectively, for 2012 compared to 2011). This could signal that the criminals merely migrating from real world into virtual sphere, and that the overall security of cash storage is roughly at the same level. When one deposits his paper money in the vault he is exposed to theft performed by the local and regional criminals; but when one stores his money in the 'cloud' every single malevolent hacker in the world becomes a potential burglar, which inflates the circle of possible intruders to the maximum: the Globe. Furthermore: identity theft, which comes hand in hand with robbing virtual money, is sometimes a far more complicated issue than just stealing money from a pocket. In the context of security, it is often brought up that paper and metal money carry bacteria and viruses ("Cash is filthy."). At the same time many overlook the fact that palpable cash is undeniably and permanently immune to all known and yet to be designed digital viruses, spyware, worms, Trojans, and other malware. While germs can be easily washed away with soap, risk management in the domain of super-computers and optical-fibers is far more complex and costly. (Domagoj Sajter, 2013)

Supporters of the cashless society mention the psychology to physically hold and touch cash ;(a culture informed by ignorance, illiteracy, and lack of security consciousness and appreciation of the merit of digital payment). (Yaqub J. O, et al, 2013)

As we have seen above there are stakeholders that say cashless society is on its way and there are others who say there are many obstacles that needs to be eliminated before cashless society becomes reality. Below we will more or less try to see the obstacles mentioned on the road towards cashless society.

2.2.2 Cashless Society and its attainment themes

2.2.2.1 Technology

For the past many years banks have been attempting to make it easier for their customers to manage their money. Customers have started receiving their salaries and paid bills by transferring money digitally without actually handling cash. Despite the easy means of making payments, society still values cash in its physical form. Yet with new technologies such as contactless payment, digital wallets and mobile payments, consumers are increasingly trusting technology to facilitate the role of handling cash payments for day to day goods. The advancement of payment technology has rapidly changed and, as a result, people are changing how they interact with money. As technology advances, consumers seem to becoming increasingly comfortable in adopting digital payment solutions leading towards an increasingly cashless society. Although security is a potential barrier to adoption, it is just a matter of time until a seamless secure option is established. Retailers need to ensure they have their digital strategies in place to add value in the appropriate way when consumers adopt this technology. (Alexis Pratsides, 2015)

Even if the use of technology is believed to make it easier for customers to manage their money, there is an argument raised on what would happen if the technology usage is being obstructed by poor infrastructure of a country. There is an argument that bases this and debates that cash is “always on and always works” a blogger of a July 2015 article on the BBC’s “future” website put it this way. “If the power goes out or there is a blip in the electronic systems that make online commerce world go around, cash is always there”. Thus, in addition to habit of using cash for a long time, not functioning technology and poor infrastructure would push the creation of cashless society farther. To say few words on the aforementioned issue of habit, old habits die hard and making the change to be completely cashless society will mean overturning tradition, which may be bigger hurdle than technology, Peter Hann, senior lecturer in corporate finance at London’s Cass business school said in 2015 CNBC special report. (Tom Pierce, 2016)

2.2.2.2 Access to financial services

Access is the ability of consumers to engage with and use financial products and services that meet their needs over their lifetime. It is a clear fact the role of inclusive financial systems in fostering economic growth, job creation and resilience is far more widely recognized. Consumers may choose not to use some types of financial services (bank accounts for example) because they believe they have little use or value. It is easy to take financial services for granted. Yet without access to financial services, people and families can find themselves shut out of modern life. When we try to see some aspects of financial service access, with bank account for example we can make and receive payments and store our money securely. Most employers now a day require their staff to have a bank account in their own name for their wages. Access to financial services is recognized globally as important to the financial stability of economies and the efficient use of resources. This is for many reasons. First a large part of combating financial crime is focused on minimizing the flow of cash and preventing money laundering that may finance terrorism. Promoting access to banking and electronic payment services helps reduce the use of cash bringing more people in to the regulated financial system where greater scrutiny and monitoring of consumers and their transactions is possible. This in turn reduces the likelihood that fraud, money laundering and financing terrorism goes undetected. Secondly financial inclusion is seen as closely linked to financial stability. Access to Financial services is also crucial to successfully implementing public policy in matters such as pension, care in later life and welfare reform.

2.2.2.3 Security

Speed of technological development and its integration into an economy far supersedes the speed of defense mechanisms and protocols that could mitigate cyber attacks. Cyber security is unparalleled and reactive in nature, which begs the question “is it safe to utilize new payment platforms.” Apart from login credentials, now a day hackers target other things. For Example in the near past hackers breached a British mobile company, three mobile’s data bases, putting at risk the private information of six million users, which later was used to purchase mobile accessories at the user’s expense. While these attacks may appear sophisticated, there are easier methods that anyone with basic IT skills can deploy. These include creating fake mobile

applications and spyware that steal information or a social engineering technique that makes one reveal login credentials. (Aman Sharma, 2016)

Relating this to the creation of a cashless society, one country on the road to cashless society has seen an increase in illegal activity related to electronic purchases. For example, in Sweden where four of five purchases are made electronically, cases of fraud have doubled in the past ten years. (Tom Pierce, 2016)

Hence, Companies, customers and the government should collectively participate to mitigate cyber attacks and minimize its damages. First all companies that offer platforms or services enabling digital payments should increase awareness among their customers of the risks and educate them on ways to secure themselves. We have witnessed scenarios whereby new users have been forced onto digital payments bandwagon without being aware of the security risks involved. Second, the government should check if current policies regulating these platforms are adequate and update them regularly, people must be educated on the risks involved, strict policies must be informed and companies accountable for not meeting security standards must be held. Benefits that come from overlooking security precautions must be minimized.

Third, customers should educate themselves about the risks involved and take precaution. In the midst of going cashless we should not cast a blind eye to the security aspect of digital payments since we all share collective responsibility to build a safe and secure digital infrastructure. (Aman Sharma, 2016)

2.2.3. What is the ultimate goal of creating cashless society?

In our above discussions we have said a lot about cashless society and cash types of payment. As we might presume cashless society creation by its self is not an end. It is a means to an end. As we have tried to touch it in a little manner, the end results of creating a cashless society are having modern banking system and increment of financial inclusion to foster economic growth and change people's life.

Increment in financial inclusion generally refers to making people be able to get access to the formal financial institutions. Financial exclusion which is the inability to access appropriate financial services now attract greater attention both in academia and policy making arenas in recent times. Low income consumers are at greater risk of financial exclusion and being

financially excluded, not only prevents people from escaping from poverty, but can also result in falling deeper into the cycle of poverty.

With this view, Major benefits of financial inclusion are increase in demand for financial products, growth in GDP, capital formation and accessibility of banking finance to rural areas. When majority of the population come into financial inclusion process, they become more aware about the various financial products available to them. The various benefits of financial products will stimulate them to go those financial products that best suits them.

When more people become aware of financial products and services, it is expected to increase the banking transactions. This will lead to opening new bank accounts by those who do not have such accounts earlier. Thus the savings of people is brought into the economy. More saving results in more capital investment which in turn results in better productivity and by return adds to the GDP.

2.3 Research gap

As the researcher to his capacity tried to figure out, there are lots of researches that were done on the means of becoming a cashless society. As discussed previously, these means are mobile banking, internet banking and ATM (POS). However, the researcher couldn't find researches that tried to see the creation of cashless society with the pillars this researcher tried to work out with. In other words, previous researches have not yet clarified if those payment means can be used to their fullest and the situations enabling the fullest usage of these payment means have been pleased. In relation with this, the researcher tried to see the usage of these payment means from an angle that previous researchers didn't bother to see. Seeing it from different perspective means, taking all cashless payment solutions at once and observing if situations suitable for using these are being satisfied. In addition to this, previous researches didn't clarify what our country's cashless society journey looks like while compared with other African and close to cashless society countries.

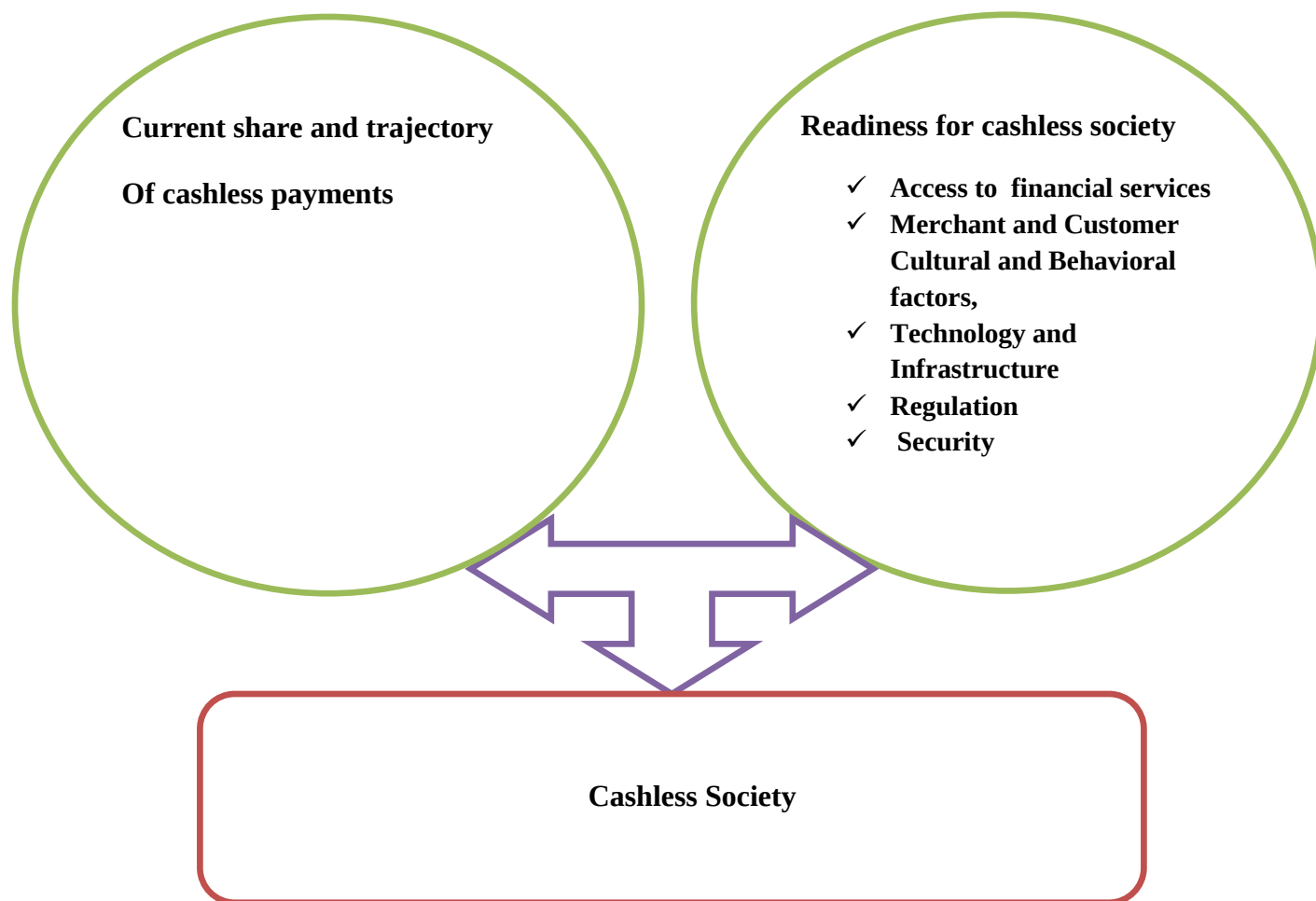
2.4 Conceptual Framework

As it can be inferred from the first chapter of this paper, the main intent of this research is examining if creating a cashless society that mostly uses electronic payment mechanisms can be created in the near future in Ethiopia (within the next five to seven years). The paper tried to address this by using two main pillars namely; current share and trajectory of cashless payments and readiness for cashless society. These two pillars are taken from a work that was done as “master card advisors’ cashless journey; the global journey from cash to cashless”. The authors then mentioned three indicators offer ways to look at cashless journey of countries. The indicators that the authors used were:

1. Share: the percentage of value of all consumer payments that are presently done by means other than cash.
2. Trajectory: a measure of the shift in cash share of all consumer payments’ value between 2006 and 2011.
3. Readiness: a measure of future potential for conversion of cash payments to electronic payments.

Taking these indicators became hard for the researcher in terms of their previously mentioned definition since the availability of data wouldn’t mainly enable him to do so. Hence, the researcher made a slight Modification to the content and definition and the conceptual framework that was worked on became as shown in the figure below.

Figure 1: Conceptual Framework



Hugh Tomas, Amit Jain and Michael Angus (September 2013) (with slight modification)

To briefly state what the above shown figure entails, the end result or the dependent variable as expressed above is the creation of a cashless society. The researcher tried to see if cashless society is on its way by basing two main columns. The first is current share and trajectory of cashless payments. Here it is seen if the journey Ethiopia has gone so far and current status in using cashless payment means shows we are on our way to cashless society or not. The second pillar on the other hand shows if we are ready in the future for the creation of cashless society. Our future in the creation of cashless society in the researcher's belief is determined by the

accessibility of financial services, the high usage of technology, the availability of security and regulation towards cashless society, the change in attitude of people and the expansion of adequate infrastructure. If the way Ethiopia has come is good and the aforementioned fostering factors are satisfied, it is certain cashless society is on its way to Ethiopia.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Overview of the Methodology

The purpose of this paper is to mainly examine if creating a cashless society that mostly uses electronic payment mechanisms can be created in the near future in Ethiopia (within the next five to seven years). The paper tried to address this by using two main pillars namely; current share and trajectory of cashless payments and readiness for cashless society. The current share and trajectory part mainly compares the current status of cashless payment mechanisms in Ethiopia with other African and other close to cashless society countries. The second pillar, readiness for cashless society has wide coverage and constitutes five sub parts. These subparts are access to financial services, Merchant and Customer cultural and Behavioral factors, technology and infrastructure, and ultimately regulation and security.

In pursuing these, both primary and secondary data sources are used. The primary data is obtained through the usage of self administered questionnaires and secondary data is gathered by reviewing various published and unpublished resources (materials). The data gathered through self administered questionnaires was analyzed with statistical package for social scientists (SPSS 16.0). Thus, the data from secondary sources was analyzed using descriptive data analysis technique.

To briefly state the method for each pillar, in the first pillar current share and trajectory part, the data was fully found from secondary sources. These sources are both published and unpublished sources. In the second pillar; readiness for cashless society, both primary and secondary data sources were used. This is for the reason that each subpart in the second pillar needs different type of approach. Specifically speaking, the data for these subparts was gathered in the following manner.

3.1.1 Access to financial services:

The notions that were seen here are bank account (account at financial institution), and branch number. What was done here is comparison of Ethiopian case with best world practices and standards. The whole data here was gathered from secondary sources.

3.1.2 Cultural and Behavioral factors of Customers and merchants

Here, using different themes the researcher tried to see the perception and attitude of customers and merchants towards cashless society. The data was gathered using self administered questionnaire which was prepared for CSMs (Customer Service Managers) in CBE.

3.1.3 Regulation

Some regulatory concerned issues also were raised to get an answer for regulatory sub part. The data was gathered using self administered questionnaire which was prepared for CSMs (Customer Service Managers) in CBE.

3.1.4 Technology, infrastructure and Security

Here perception of CSMs of commercial bank of Ethiopia towards technology and infrastructure themes in relation with cashless society was investigated. Here also self administered questionnaire was prepared for CSMs (Customer Service Managers) in CBE.

3.1.5 Security

Security themes in relation with cashless society were investigated here. This was seen using self administered questionnaire that was prepared for CSMs in CBE.

3.2 Sampling Techniques

The target populations for the data gathered through self administered questionnaire were all CSMs of CBE at Addis Ababa branches. The sampling technique used was as follows:

For the data gathered from CSMs, Convenience non probability sampling technique was used. This method was thought to be suitable since it is fast, inexpensive, easy and all subjects are readily available. In addition to this, the sampling technique was preferred since the researcher could use units that are accessible. As a result, I was able to take people who were willing to

participate. In taking those who are willing to participate, the researcher thinks true data can be gathered and this will add to the reliability of the data. The criticism often heard in using convenience sampling technique is that there might be individuals who might be left out during selection process and there can also be individuals who are overrepresented in the sample. Thus, the researcher believes the homogeneity and similar operational style of the population helped tackle this problem.

3.3 Sample Size Determination

According to the official website of commercial bank of Ethiopia it has 1192 branches throughout our country as at June 12, 2017. The bank has 15 districts and the 4 districts are found in Addis Ababa. These districts in Addis Ababa consist some branches that are found at the tip of Addis but not in Addis Ababa region. The table below shows the branches and districts that the CBE has under it.

Table 1: Number of Branches in each District of CBE.

No.	District's Name	Branch Number
1	Adama	69
2	Bahir Dar	79
3	Dessie	72
4	Dire Dwa	87
5	Gonder	51
6	Hawassa	72
7	Jimma	67
8	Mekele	92
9	Nekemte	76
10	Shashemene	74
11	Wolaita Sodo	67
12	East Addis	94
13	North Addis	98
14	South Addis	84
15	West Addis	110
Total number of Branches in Addis Ababa districts		386
Total number of Branches throughout Ethiopia		1192

Source: CBE Public Website June, 12 2017

As continual to the above branches' data, the table below shows the branches in each regional state.

Table 2: Number of branches of CBE by Regional State

No	Region	Number of Branches
1	Addis Abeba	255
2	Afar	16
3	Amhara	203
4	Tigray	89
5	Benishangul Gumuz	13
6	Dire Dawa	15
7	Gambella	4
8	Harar	6
9	Oromia	392
10	Southern Ethiopia Nations, Nationalities and peoples	168
11	Somali	31
	Total	<u>1192</u>

Source: CBE Public Website June, 12 2017

According to several scholars, there are mostly two things to take care while selecting sample size. These are Margin of error and confidence level. In addition to these indicators, heterogeneity and homogeneity of the population also matter in deciding the sample size. Bearing this in mind, the researcher decided to tolerate the margin of error to be 7% and confidence level to be 90%. While these figures are plugged in to the population, the sample size becomes 90. Hence, the researcher used 90 CSM respondents in commencing the research. It is to be recalled that the total population is number of branches in Addis Ababa which is 255.

3.4. Type of data and data Collecting Instrument

The types of data that the researcher used were both primary and secondary data sources. As it was briefly mentioned above, the data collecting instruments that the researcher used were both primary and secondary data collecting instruments. The primary data collecting instrument was self administered questionnaire and the secondary data was gathered by reviewing various published and unpublished resources (materials).

3.5. Analysis and Interpretation of Data

The data gathered through self administered questionnaire was analyzed with statistical package for social scientists (SPSS 16.0). In doing so, median, mean, standard deviation and inter quartile range were calculated. The median, as it is a measure of central tendency, shows what the average respondents might think. On the other hand the inter quartile range is a measure of dispersion and it shows whether responses are clustered together or scattered across the range of possible responses. A value of inter-quartile range equaling

The major data analysis tools that were however used in the research were mean and standard deviation. However, median and inter-quartile range are also calculated. Thus, the interpretation of the data is presented using mean and standard deviation. The data from secondary sources was analyzed using descriptive data analysis technique by which gathered data was described using different techniques. These techniques are explanations, graphical representations and charts.

3.6. Data presentation

The collected data is presented using (editing, coding, tabulation, calculating mean, standard deviation, median and IQR). These methods are thought to be suitable for this research because the researcher believes they are not sophisticated, time consuming and suitable ways for analyzing and interpreting the kind of data that the researcher gathered.

Editing: is a process by which raw data are checked to verify that the data have been correctly entered from the data collection form to the device of analysis.

Coding: is assigning numerals or other symbols to answers so as to enable the responses to be grouped in to a limited number of classes or categories.

Tabulation: is the process of summarizing raw data and displaying it in compact form for further analysis.

Mean: According to Elfagid Aregahegne 2015 citing Mann, P.S., 1995 indicated, the arithmetic mean is a measure of central tendency which may be used to represent the data in an entire population. As Rajeev Kumar citing Scott (1999) suggested, for likert type scale ranging from 1 (strongly Disagree/highly Dissatisfied) to 5 (Strongly agree/Highly Satisfied) interpretation of values should be like, mean up to 2.8 Disagree, 2.9 up to 3.2 neutral and mean above 3.2 to be Agree. Thus, the researcher has followed this rule in interpreting the results.

Standard deviation: is widely used to measure the variability in statistics and probability theory. It shows how much variation there is from the mean. A standard deviation less than 1 indicates data points tend to be very close to the mean and there was general consensus by the respondents on the variables under consideration. Whereas, high standard deviation having a value greater than 1 indicates that the data is spread out over a large range of values which means there were varied options among respondents regarding variables considered. (Elfagid Aregahegne 2015 citing Mann, P.S., 1995) Thus, this rule was followed.

Parallel mixed method design was employed for data analysis where qualitative and quantitative data were collected and analyzed and the findings from each study were compared and linked to the subject matter under consideration. (Elfagid Aregahegne, 2015)

3.7. Validity and Reliability

3.7.1 Validity

Validity is the extent to which an instrument measures what it is supposed to measure and performs as it is designed to perform. It is rare, if nearly impossible, that an instrument be 100% valid; so validity is generally measured in degrees. As a process, validation involves collecting and analyzing data to assess the accuracy of an instrument. There are numerous statistical tests and measures to assess the accuracy of an instrument.

External validity: is the extent to which the results of the study can be generalized from a sample to population. Establishing external validity for an instrument then follows directly

from sampling. It is apparent that Sample must be an accurate representation of a population. In order for the sample to be representative and to add to the validity of the data, the researcher has tried to make the sample to be 35% of the population.

Content validity: refers to the appropriateness of the content of an instrument. In other words, do the measures (questions, observation logs etc) accurately assess what you want to know? In order to assure this validity issue the researcher tried to see the variables from internal and external sides and tried to design the questionnaire based on this. For example, if we consider security factor, it is considered in a way as external security factors in relation with cashless society and internal security factors in relation with cashless society.

3.7.2 Reliability:

Reliability: is measure of stability or consistency. For example, a medical thermometer is reliable tool that would measure the correct temperature each time it is used. In trying to make the data reliable, one best way the researcher thought was choosing and asking CSMs than other bodies of the bank. They were chosen since they were close to all variables the researcher has identified as to have effect on the creation of cashless society.

3.8.Ethical consideration

The respondents are given privilege of not writing their names and other identities so as to hide them from unwanted approaches to be maintained by any other groups. Similarly, no respondent was forced to fill the questionnaire unwillingly and/ or without his/her consent.

CHAPTER FOUR:-

DATA PRESENTATION AND ANALYSIS

4.1. Introduction

As it was indicated in previous discussions, the study tried to see if creating a cashless society is a possibility in the near future in our country. The researcher tried to figure this out by creating two pillars namely current share and trajectory of cashless payment solutions and readiness for cashless society. The gathered data for each of these pillars will by sequence be presented as it is indicated below.

The presentation, analysis and interpretation of the gathered data were designed in a way that can be understandable and simple. The first pillar, current share and trajectory part will have two sections. The first section will be trajectory and current share of mobile money in Ethiopia in comparison with other African countries. After we in the first section compare the case of Ethiopia with other African countries, the next section would be presentation of the data on trajectory and current share of ATM and POS in Ethiopia in comparison with African and close to cashless society countries.

After the data presentation and analysis of the first pillar is finalized, the data presentation and analysis for the second pillar will continue. As it was indicated above, the second pillar tries to see if our country is ready for creating cashless society or not. In doing so, the analysis of the data gathered for this pillar would have five sub parts. The first sub part consists presentation of the data gathered relating with Access to financial services.

After the aforementioned sub part that is gathered from secondary sources is presented, all the data that were gathered through self administered questionnaire would be presented. This would constitute all the remaining four sub parts.

The next sub part to be presented is the demographic information consisting Gender, Age, Work experience and Year of service of respondents that filled the questionnaire. After this sub part, the third sub part that constitutes the analysis of Security factors in relation with the creation of cashless society would be presented. Here, the interpretation for the twelve security related questions would be presented. Afterward the fourth sub part that constitutes the interpretation for

regulation related questions and results to them is analyzed. Subsequently, sub parts five and six consisting the analysis relating with technology/infrastructure factor and cultural/behavioral factor would be presented.

4.2.Trajectory and Current share of Mobile Money in Ethiopia and other African countries

4.2.1. Global trend of mobile money at a glance

39% of the world's population mostly comprised of the population in developing countries does not have a bank account. (Elena, 2016) This trend of lack of financial inclusivity is tried to be tackled with the use of cashless payment solutions. Mobile money cashless payment solution is the mostly used platform with this view. Mobile money now is available in two thirds of low and middle income countries. In relation with this, Mobile money providers are processing an average 30,000 transactions per minute or more than 43 million per day. More than 40% of the adult population in Kenya, Tanzania, Uganda, Gabon, Paraguay and Namibia are using mobile money on an active basis. This is an increase from just two countries in 2015 (Kenya and Tanzania). In December 2016, the industry processed more than US\$22 billion in transactions and 118 million accounts were active (for 30 day) during December 2016. In sub Saharan Africa there were 277 million registered accounts in December 2016- more than the total number of bank accounts in the region. At this time total revenue for the top providers of mobile money surpassed US\$ 1 billion.

Figure 2: Global Trend of Mobile Money

GLOBAL TREND OF MOBILE MONEY AT A GLANCE					
39% NO BANK ACCOUNT	2/3MOBILE MONEY AVAILABLE IN LOW AND MIDDLE INCOME COUNTRIES	30,000 MOBILE MONEY TRANSACTIONS PER MINUTE	US\$22 BILLION TRANSACTIONS	US\$ 1 BILLION TOTAL REVENUE FOR THE TOP PROVIDERS OF MOBILE MONEY	277 MILLION REGISTERED ACCOUNTS IN SUB SAHARAN AFRICA

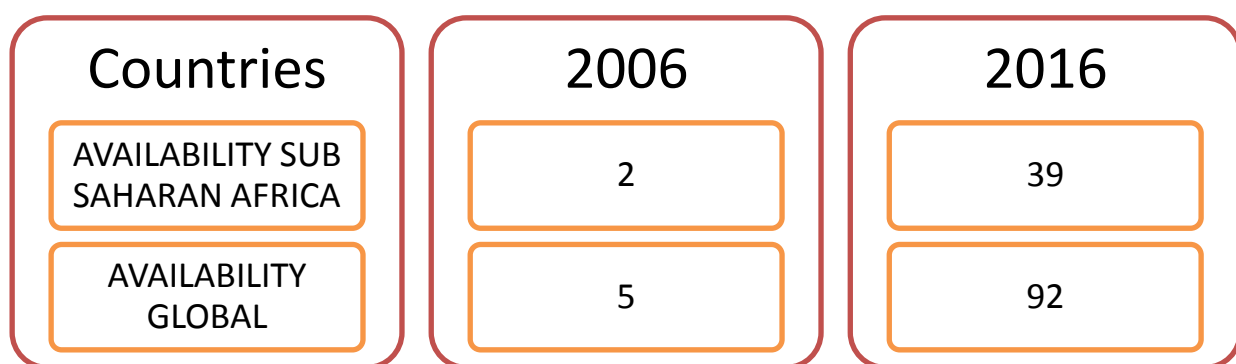
Source: GSMA 2016 and (LTP) Elena 2016

4.2.2. Mobile money in Africa

The acceleration in economic growth in Africa has been accompanied by an expansion of access to financial services. Particularly, commercial banks have been traditionally and remain the backbone of financial system in sub Saharan Africa. These commercial banks have undergone dramatic changes over the past years. Financial liberalization and related reforms, upgrades in institutional and regulatory capacity and recently the expansion of cross border banking activities with the rapid development of pan African banking group networks have significantly changed the African banking and financial landscape. In relation with this, account penetration has particularly improved in east and southern Africa. As mentioned earlier; these favorable developments have been facilitated by ongoing financial innovation. In particular, the rapid penetration of mobile phones has contributed to the fast rise of mobile banking in sub Saharan Africa, providing an opportunity to reach consumers in remote areas where efficient transport infrastructure is lacking.

While trying to see the growth of this particular banking solution, in 2006, the countries that mobile money was available were only 2 Sub Saharan African countries and 3 other countries. However, with what can be considered as short period of time in 2016, mobile money has wide spread in many African and world countries that includes Ethiopia.

Figure 3: Decade of Progress of Mobile Money



Source: GSMA State of mobile money in Sub Saharan Africa 2016

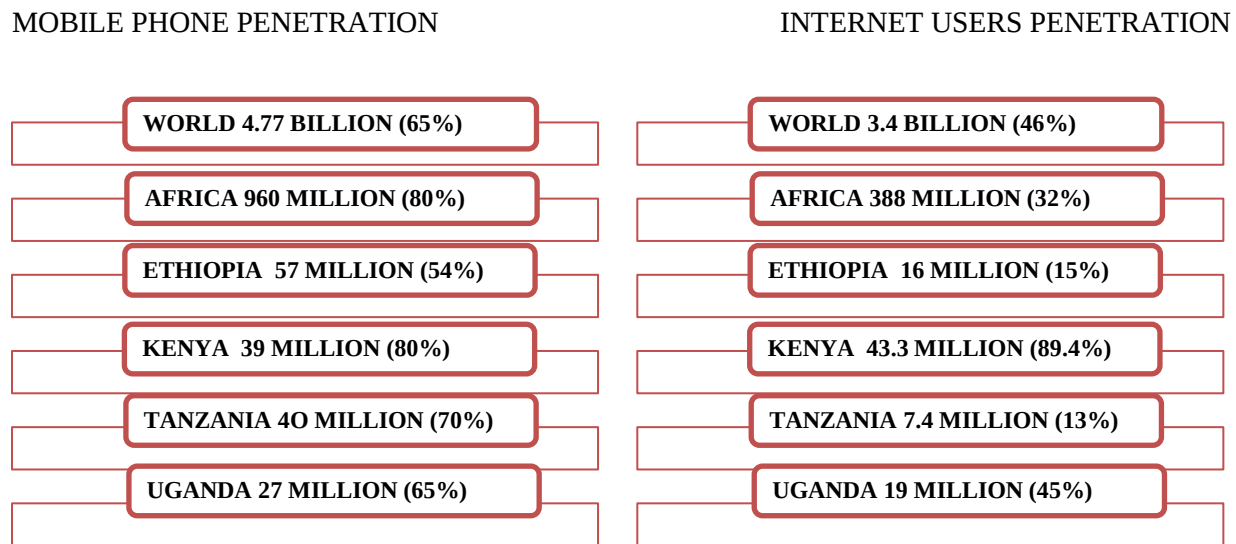
As mobile phone penetration and internet users rise, many increasingly believe smarter approach to reducing cash dependency would be through encouraging the increased use of mobile phones for payments. It is due to this encouragement that mobile money penetration around the globe has been rapid. Of course mobile financial services depend on mobile phone penetration and penetration is rapidly growing in sub-Saharan Africa. (Kenshi tsunemine, 2016)

Relating to this, in 2017 there are an estimated 4.77 billion mobile phone users worldwide according to statista. this in other words means an estimated 65 percent of the globe's population already owns a mobile phone.

When the African case is considered, According to an article published on all Africa news website, there are currently around 960 million mobile subscriptions across Africa. This is an 80 percent penetration rate among the continent's population. When we come to eastern African countries, according to press briefing by Ethio telecom citing IT web site, the number of users in Ethiopia has reached 57.43 million. With this regard, Kenya's record of mobile phone subscription became at a total of 39.15 million subscribers at March, 2017 according to Kenya's communication authority. Moving with the same topic, Mobile SIM population in Tanzania stood at 40 million according to CIA. In Uganda it is at 65% from a population of 41.6 million people.

In relation with internet users, in June 2017 there were an estimated 388,104,452 internet users from a population of 1.2 billion people in Africa. This shows a penetration rate of around 31.2%. Concerning with this, there are around 16 million internet users in Ethiopia from a population of an estimated 104 million. When we come to Kenya's case, Kenya has around 48.5 million people and from this internet users stood at June 2017 to be 43.3 million (showing an impressive penetration rate of 89.4 %.) With this regard, Tanzania has 56.8 million people and internet users are 7.4 million people. Ultimately referring to inter world stats website Uganda has 19 million internet users from a population of 41.6 million.

Figure 4: Mobile phone and Internet users' penetration world and Africa



As it can be inferred from the above figure, Ethiopia doesn't have satisfactory mobile and internet penetration rate in contrast with other east Africa region countries. For example the African average in both internet users penetration and mobile phone penetration is 80% and 32% respectively. The score of Ethiopia as it is inferred from the data is way below the average which on effect can make the adoption of mobile payments to be sluggish.

As many agree, the aforementioned penetration rate increment is highly believed to contribute to the growth of mobile money in sub Saharan Africa. Hence, the growth of mobile money in sub Saharan Africa rides on the back of the previously mentioned region's impressive mobile phone penetration curve. It is due to this fact Mobile money accounts are slowly replacing traditional bank accounts in sub Saharan Africa According to a report by GSMA. GSMA, the body that represents the interests of mobile operators worldwide on its report, the mobile economy: sub Saharan Africa 2017 indicates, there were 280 million registered mobile money accounts in the region at March 2017. Another study by GSMA shows more than 40 percent of adults in Gabon, Ghana, Kenya, Namibia, Tanzania, Uganda and Zimbabwe are active mobile money users. Kenya remains the global leader in mobile money with its hugely successful M-Pesa service which is celebrating 10 years of operations. (GSMA, 2016)

In comparing the sub Saharan Africa region with other world countries, only 13 countries around the world have mobile money account penetration of 10 percent or more. Not surprisingly, all 13

of these countries were in sub Saharan Africa. As it is inferred from several data, Mobile banking and mobile money accounts are especially widespread in sub Saharan Africa. Within this group, the share of adults with a mobile money account ranges from 10 percent in Namibia to 58 percent in Kenya. Kenya is followed by Somalia, Tanzania and Uganda all having over 35% penetration rate. (Kenshi Tsunemine, 2016) while this is compared with Ethiopian case, the mobile money account penetration was in the range from 0-4 percent. (Jang Jong moon and park hyunju, 2016).

In continual with our observation on mobile money, Brookings financial inclusivity report, that looked at 26 countries across Africa, Asia and Latin America and assessed those countries' commitments in devising national financial strategies, penetration of mobile services and various use of both traditional and digital financial services pointed out, Kenya, South Africa, Uganda, Rwanda and Nigeria ranked among the top ten in the list of countries surveyed.

The survey has had four dimensions in assessing financial inclusivity of countries. The dimensions used were country commitment, mobile capacity, regulatory environment and adoption. Bearing this in mind, the financial inclusivity of countries became as what is shown in figure 5. According to the institute, in overall financial inclusivity Kenya stood at first followed by South Africa and Uganda.

In relation with this, the survey's dimension mobile capacity was considered as to indicate the existence of opportunities for enhanced adoption of mobile money and other digital financial services that leverage mobile infrastructure. This in the researcher's belief tells the opportunity we and others have in increasing the number of mobile money users in the future. As it is seen in figure 6, Kenya scored high because of the Kenyan government's support for branchless banking activities through modifications introduced into the finance act. This allowed third party entities, based in places as varied as supermarkets, gas stations and post offices to act as agents for the banks. (John D. Villasenor et. El, 2016)

According to this survey, South Africa scored highest followed by Kenya, Rwanda and Nigeria in mobile capacity dimension. Even if in the overall inclusivity report Ethiopia stood higher only from Egypt, in mobile capacity, it stood at last from all 26 countries surveyed. This implies the opportunities created in infrastructure for future adoptions of mobile money are less in Ethiopia.

Figure 5: Financial inclusivity in Africa

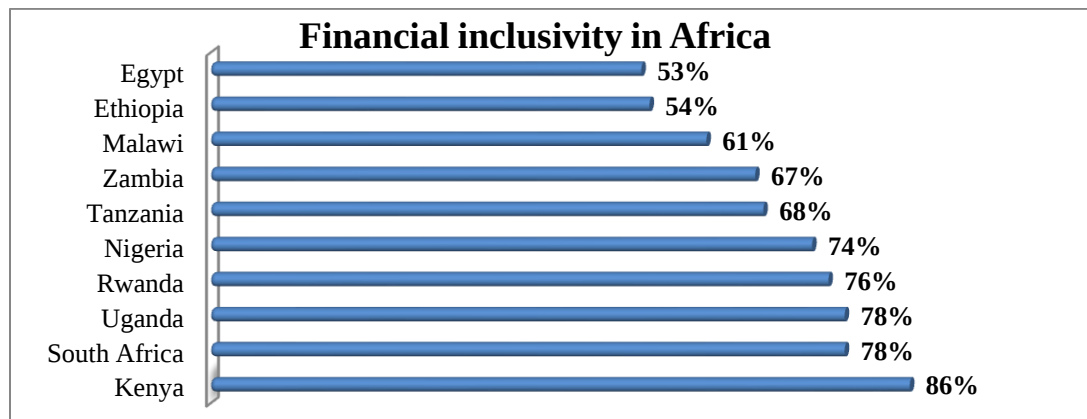
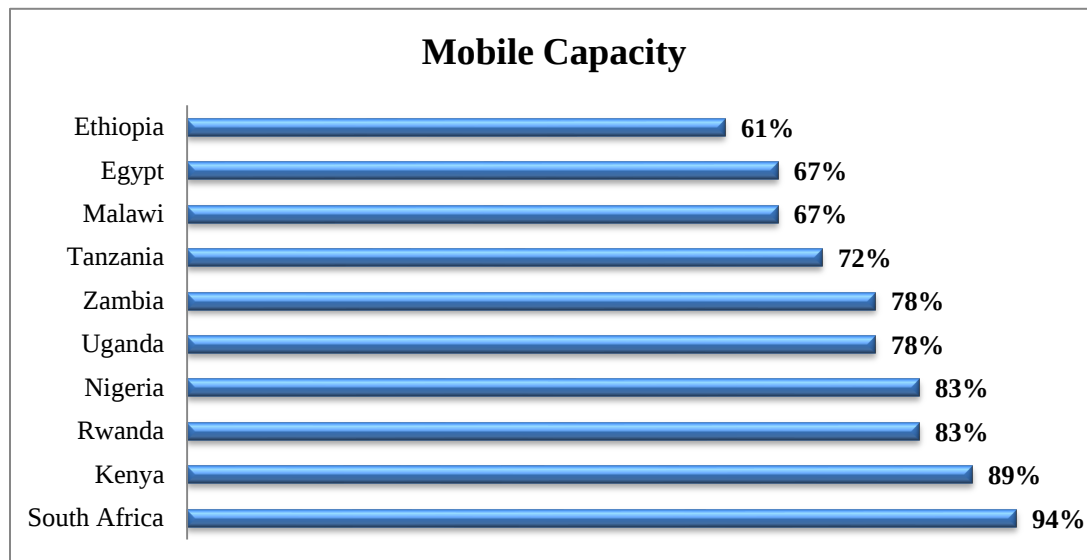


Figure 6: Mobile capacity key findings (2017)



Source: 2017 Brookings Financial and digital inclusion report

It is believed that the above mentioned significant developments in mobile money infrastructure in African countries acted as a major boost for financial inclusivity- surpassing the use of traditional bank accounts in many countries. The African continent has become the world leader in the adoption of the mobile money platform as expressed earlier. By 2014 for example nine African countries had more people having mobile money accounts than actual bank accounts. This is why the researcher is keen with the idea of comparing our country with other African countries than comparing it with other parts of the world. Below I have tried to present brief mobile money introduction of four African countries- Kenya, Tanzania, Uganda, and Ethiopia.

Mobile money in Kenya

In Kenya nearly 7 in 10 people own a mobile phone and use it regularly to make or receive payments thanks to M pesa. (M Pesa M for mobile pesa for money (Swahili) is a mobile phone based money transfer, financing and micro financing service launched in 2007 by Vodafone for safaricom and Vodacom the largest mobile network operators in Kenya and Tanzania. It has since then expanded to Afghanistan, South Africa, India, in 2014 to Romania and in 2015 to Albania. M pesa is a branchless banking service and its customers can deposit and withdraw money from a network of agents that includes airtime resellers and retail outlets acting as banking agents. M pesa was originally designed as a system to allow microfinance loan repayments to be made by phone reducing the costs associated with handling cash and thus making possible lower interest rates. The service allows users to deposit money into an account stored on their cell phones, to send balances using pin secured SMS text messages to other users, including sellers of goods and services, and redeem deposits for regular money. Users are charged a small fee for sending and withdrawing money using the service. M pesa has spread quickly and by 2010 had become the most successful mobile phone based financial service in the developing world. By 2012, a stock of about 17 million M pesa accounts had been registered in Kenya and by the end of 2016, this number of m pesa users has reached more than 21 million. The service has been lauded for giving millions of people access to the formal financial system and for reducing crime in otherwise largely cash based societies.

Kenya has leveraged mobile phone technology and made remarkable strides in financial inclusion. There are currently 38.3 million phone subscribers in Kenya. This has allowed access to formal financial services to grow from 26 percent in 2006 to over 75 percent in 2016.

Only 4 million (2012) Kenyans had bank accounts. But 17 million people in the country by 2012 used m pesa money transfer service. The other way round, by 2012 in Kenya, 17 million m pesa accounts had been registered and in 2014 over \$19 billion transactions were made through mobile phones. As at November 2014, M pesa transactions for the 11 months of 2014 were valued at KES 2.1 trillion, a 28% increase from 2013, and almost half the value of the country's GDP. Kenya in 2016 had more than 161,583 registered agents. (Kenn Abuya, 2017) The course

of 2015 handled 80m transactions worth some ksh442.2bn (4.3\$bn). The Kenyan government's quarterly update on communications sector showed there were 31 million subscriptions across the country's competing mobile money services.

Mobile money in Uganda

Mobile money services were first introduced in Uganda in March 2009. Currently there are seven mobile money schemes in Uganda. The bank of Uganda has only approved mobile money operations when it is done in partnership with supervised financial institution. In 2015, registered customers reached 21.1 million and the average monthly number of transactions in the last quarter of 2014 was 46 million worth shs 2.1 trillion. (Martin Luther, 2016)

In relation to this, the value of transactions in billion shs was 32,506. Thirty five percent of adults in Uganda also had registered mobile money accounts than bank accounts. In 2015, thirty five percent of Ugandan adults have a registered mobile money account. Mobile money usage surpassed the use of both banks and non bank financial institutions. By 2016, the number of registered mobile money customers exceeds half the population of Uganda. (Ivan James, 2016)

By the end of 2016, mobile money providers numbered seven in total in Uganda including MTN, Airtel, Uganda Telecom, Africell, M-cash, PayWay and Eeezy Money. The number of mobile money agents as at December 2016 was 132,937 agents. (Martin Luther, 2016)

Mobile money in Tanzania

M pesa was launched in Tanzania by Vodacom in 2008 but its initial ability to attract customers fell short of expectations. In 2010, the international finance corporation released a report which explored many of these issues in greater depth and analyzed the strategic changes that vodacome has implemented to improve their market position. As of may 2013, M pesa in Tanzania has five million subscribers.⁴⁴ In June 2016, a total of 7 million M PESA accounts have been opened in Tanzania by Vodacom.⁴⁴ Tanzania has increased financial inclusion by 57 percent. Mobile money in Tanzania in recent years has seen impressive growth. The number of Tanzanians with mobile money accounts rose to 18.08 million or 35% of the population according to Tanzania's communication regulatory authority. This is up from 17.4 million in the previous quarter. The mobile money sector has benefited from Tanzania's mobile phone penetration, which grew by

four percentage points to 67% between 2014 and 2016. In April 2008, Vodafone based on the success of M-pesa in Kenya started Tanzania M-pesa with Vodacom, which is partly owned by Vodafone. The service was not that successful however at first. During the first 14 months of each M-pesa, Kenya had generated 2.7 million users and 3,000 agents; on the other hand Tanzania had a mere 280 thousand users and 930 agents. Service providers therefore employed a different pricing model featuring a flat fee; offered registration incentives and the product of paying bills simplified the marketing. This modified strategy was successful to make Tanzania a country with one of the highest rates of mobile money penetration along with Kenya. The pattern of mobile money penetration is not uniform across sub-Saharan Africa. (Paul Laishman, n.d.)

Mobile money in Ethiopia

Ethiopian banks and microfinance firms launched mobile money services helping reach swathes of the population that now have little access to branches or services. The launch of the service allows customers to make payments or receive money via a mobile that is linked to bank account. This has made other African nations to draw millions of people into the financial system. Netherlands based belcash is offering a technology called hello cash while, MOSS ICT, mainly owned by an Ireland based firm is rolling out M-birr. In both cases Ethiopian banks and institutions offer the service to customers and hold the cash deposited, in line with government policy that bars foreign firms or banks from investing in the financial sector.

According to official site of M-birr, M-birr is the first mobile money service in Ethiopia. It started piloting its service in February 2013. It allows doing financial transactions from convenience of mobile phone. This service is run and operated by five regulated financial service providers in Ethiopia. These institutions are Amhara credit and saving institution, (Amhara regional state) Addis credit and saving institution (concentrating on Addis Ababa and Oromia region surrounding), dedebit credit and saving institution s.c (Tigray region), Oromia credit and savings s.c. (operating in Oromia region) and (OMO microfinance institution sc operating in SNNPR). These institutions concentrate on the improvement of the economic situation of low income people through increased access to lending and saving services. This geographical disbursement of these financial institutions is thought to be helpful in reaching many people throughout the country. At this instance, the M-birr service providers have a combined 800

branches throughout Ethiopia and plan to have between 3000 and 6000 agents in the next 2 years. M birr customers can pay for goods and services using their mobile phone. In addition to this, m birr customers can pay their taxi fare, pay for petrol, pay for job subscriptions and the like.

According to Dana Sanchez published article in April 2016, 150,000 users signed up for m birr in Africa's second most populous country. In Ethiopia, the introduction of M birr service facilitated over 273,000 transactions in and 50,000 account holders in 2015.

The other provider of such mobile money service is hello cash. It is mobile and agent banking (mobile money) service provided by banks and microfinance. The service is currently provided by three major financial institutions; lion international bank s.c. cooperative bank of oromia s.c and Somali microfinance institutions s.c. Through hello cash money can be sent, payment for goods and services can be done and air time can be topped up. In addition to this, there are other services like hello cash business account and pay bill service. Hello cash has currently around 4250 agents.

Less than a fifth of Ethiopians had a bank account in 2014, against three quarters in neighboring Kenya, according to the World Bank. But the government has set a target of increasing the number of bank account branches in the country. Officials look south to Kenya for an example of the potential- the mobile money system there has nearly 18 million users.

Ethiopia's banks have reached to 18 and the total bank branches have at third quarter of 2016/2017 reached 3,807. Therefore, currently one branch serves 24,783.82. In addition to branches which are expensive to set up, banks plan to authorize thousands of agents, such as shops or merchants, in line with new regulations. Such agents will be able to take deposits and hand out cash via the mobile system. Ethiopia's initiative mirrors the model pioneered in Kenya, where there are now 27 million users in the nation of 45 million.

The state owned giant, commercial bank of Ethiopia has started agent banking called CBE birr. The move came four years after the bank started feasibility study to provide the service. The move by CBE, whose market share is around 40% to start this service, is said by people to be wise. CBE has the reputation and the resources to penetrate the market. It can leverage its

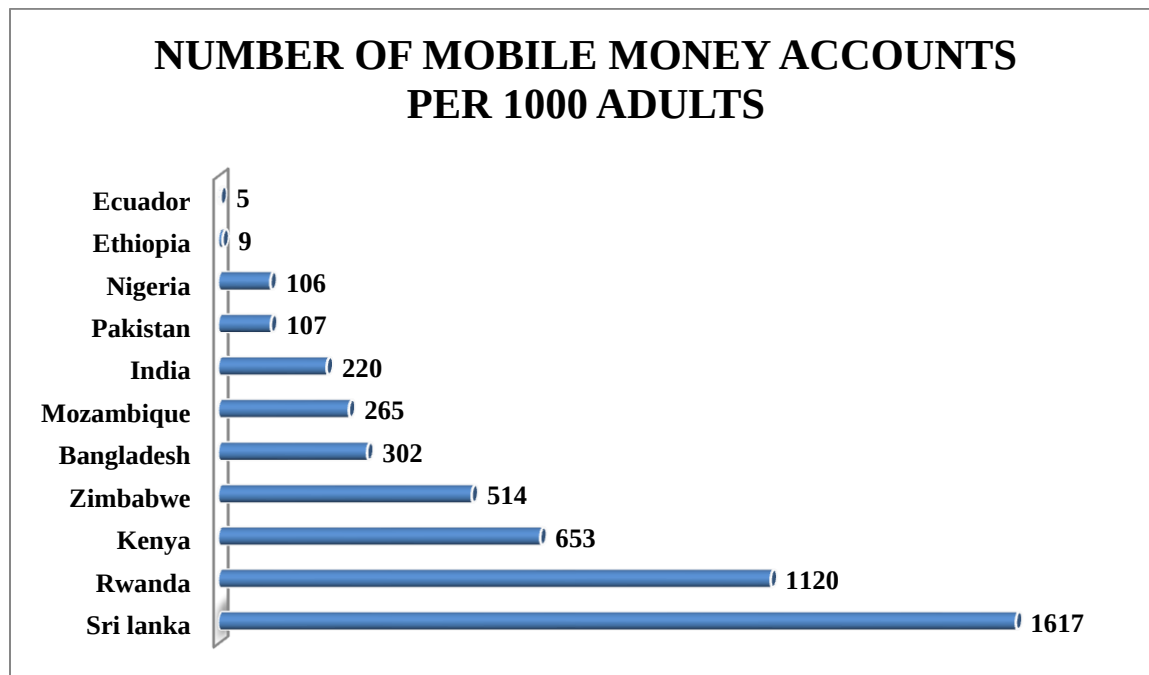
reputation to get considerable market share in mobile money activities and can make our country be like other countries that are using mobile money more often.

Mobile money in Other African countries

As we have observed above, Kenya does have an experience not only to African countries but also to the entire world when it comes to mobile money services. Relating to this, another neighbor of Kenya Somalia has 37% mobile money penetration which is the second highest in the world after Kenya. Telesom, a mobile network operator in Somaliland launched Zaad in 2009. The service is influenced by M pesa of Kenya but telesom adjusted the model to suit Somalia. A report by the economist states the only place where mobile money is often preferred to cash for small transactions is Somaliland, the autonomous and peaceful northern part of Somalia. The main system there is on a network run by dahabshil, a firm that started as a remittances business and bank rather than as telecoms provider. In contrast to almost everywhere else in Africa, making payments in Somaliland is free. This success of mobile money services in Kenya and Somaliland has spread to surrounding countries such as Tanzania, Rwanda and Uganda. In Rwanda one in five adults is actively using mobile money, about double the percentage of bank users. However, in the West African region, this mobile money service has been slow to expand. In relatively wealthy countries in North Africa the penetration rate of mobile money is even lower. (Jang Jong moon and park hyunju, 2016)

The above summary being said about some African countries' progress on mobile money, According to the World Bank group, the figure below shows number of mobile money accounts per 1000 adults in some countries. As it is shown, our country has lowest number of mobile money accounts compared with other African and world countries. East African countries like Kenya and Rwanda have very large number of people using the platform than those using it in our country. This shows where we are standing when we are compared with countries having impressive penetration of mobile money accounts. For example, the country that has the largest penetration was Sri lanka. The lowest penetration in the same data was found in Ecuador which was 5 per 1000 adults.

Figure 7: Number of mobile money accounts per 1000 adults



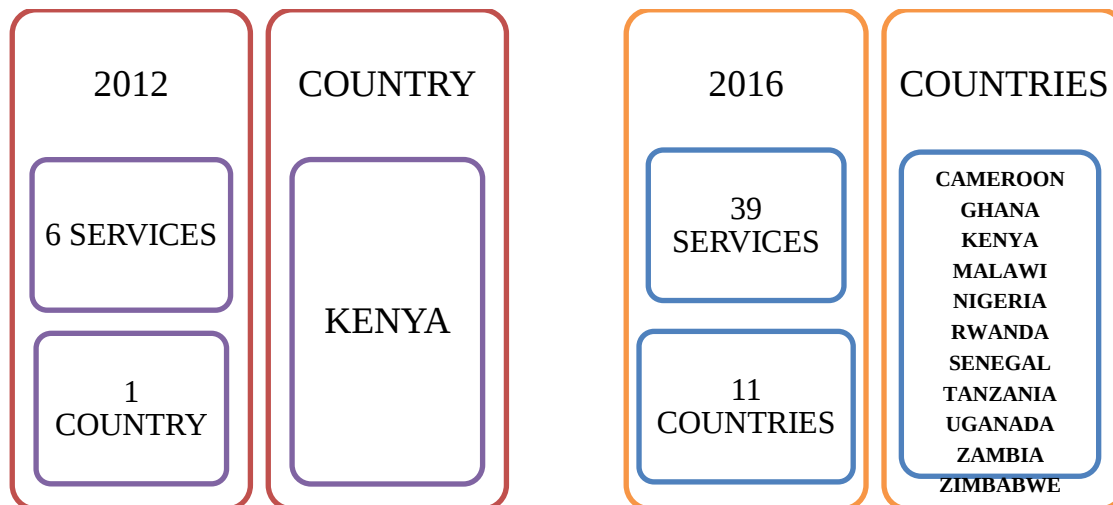
Source: Global payment System survey World Bank

4.2.3. New Developments In mobile banking

There are other services that have already been started in Africa with the rapid penetration of mobile money accounts. From these services mobile credit is notable. A more recent addition to the mobile financial services industry is this mobile credit that allows mobile subscribers to borrow an agreed up on sum of money and repay by specific date using their mobile device. In 2014, there was 50% increase in the number of mobile credit services globally. The most widely used mobile credit service with over 7 million users is Safaricom's M-sahwari launched in Kenya in 2012 in partnership with Commercial bank of Africa. Second in line is vodacom's M-pawa modeled after M-sahwari for Tanzania's market. The M-pawa service initiated in May 2014, already boasts more than 1 million users. (Ingrid Brill, 2016)

In relation with this, the growth of mobile credit services in sub Saharan African countries is as depicted below in the figure: Bear in mind Ethiopia is not included in the list of countries below. This proves other sub Saharan African countries have started making mobile money services to be used in innovative ways. As it is depicted from the figure, the only country in Africa where mobile credit was Available 2012 was Kenya. At 2016 this service has spread to 11 countries.

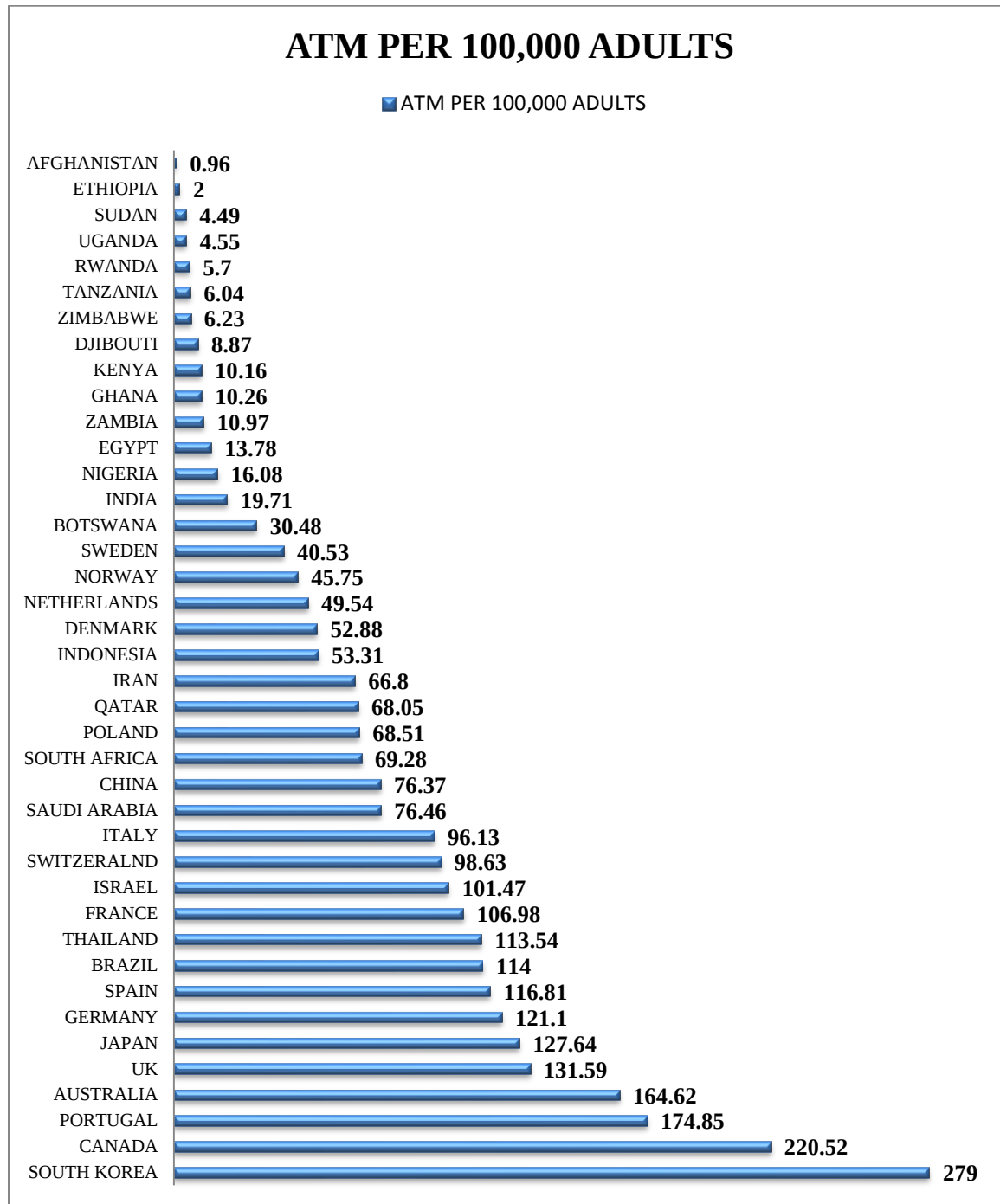
Figure: 8 Mobile Credits in Africa



Source: the state of mobile money sub Saharan Africa 2016

4.3.Trajectory and current share of ATM in Ethiopia and other countries

Figure 9: ATM penetration around the world



Source: The World Bank retrieved from www.theglobaleconomy.com

The above figure shows ATM machine per 100,000 people in countries around the world. The average for 2015 end was 50.95 ATMs per 100,000 adults. Ranked based on data from world bank, the republic of Korea is the most ATM dense country in the world, with 279 ATMs per 100,000 people, followed by Canada and Portugal with 220 and 174 ATMs per 100,000 people respectively. The data showed that Africa is by far the large continent with the least amount of ATMs available- with South Africa ranking highest on the continent. Countries such as Chad, Ethiopia and Sierra Leone statistically have 0 ATMs per 100,000 populations. The country that stood at last was Afghanistan with 0.96 ATMs per 100,000 people. As it can be implied from the data the average for the world is around 51 ATMs per 100,000 people. This implies the ATMs that our country has is well below this average. According to master card advisors, 2015 the countries that are thought to be close to cashless society are Belgium, Canada, France, UK, Sweden, Australia, and Netherlands. The table below shows where our country stands while compared with these countries in relation with ATM penetration per 100,000 People. As how far our country lags from these countries is as indicated above in the table.

Table 3: Comparison of Ethiopia & close to cashless society countries with ATM/100,000 adults

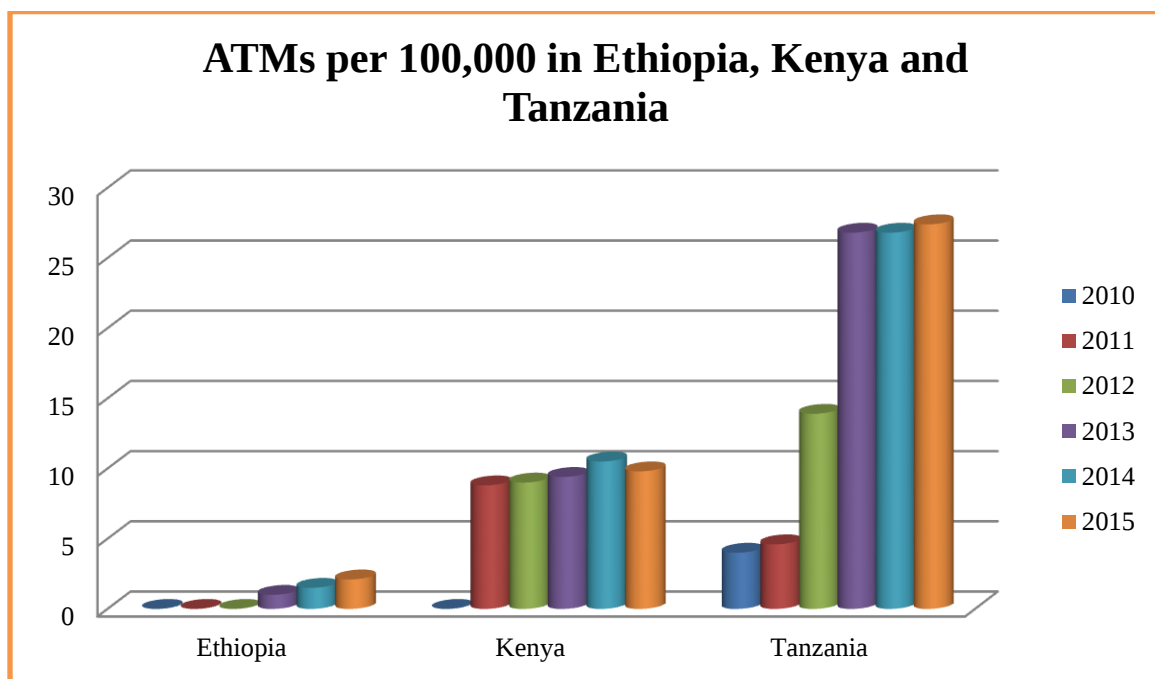
Country	ATM penetration per 100,000 adults
Ethiopia	2
France	106.98
UK	131.59
Canada	220.52
Belgium	93.10
Netherlands	49.54
Australia	164.62

Source: The World Bank retrieved from www.theglobaleconomy.com

According to the IMF, Ethiopia significantly lagged behind other sub Saharan African countries in most of financial access measures including branch numbers, ATMs, depositors and creditors.

Speaking with a related topic, the figures below will show us the path we have come and the situation that we are in now while our case is compared with other countries in relation with ATMs per 100,000 people. According to the latest World Bank report, the figure below shows ATM penetration rate of three African countries in comparison. As it is indicated below, the graphs above and below shows a lot needs to be done in the case of ATM Penetration.

Figure 10: ATMs per 100,000 in Ethiopia, Kenya and Tanzania

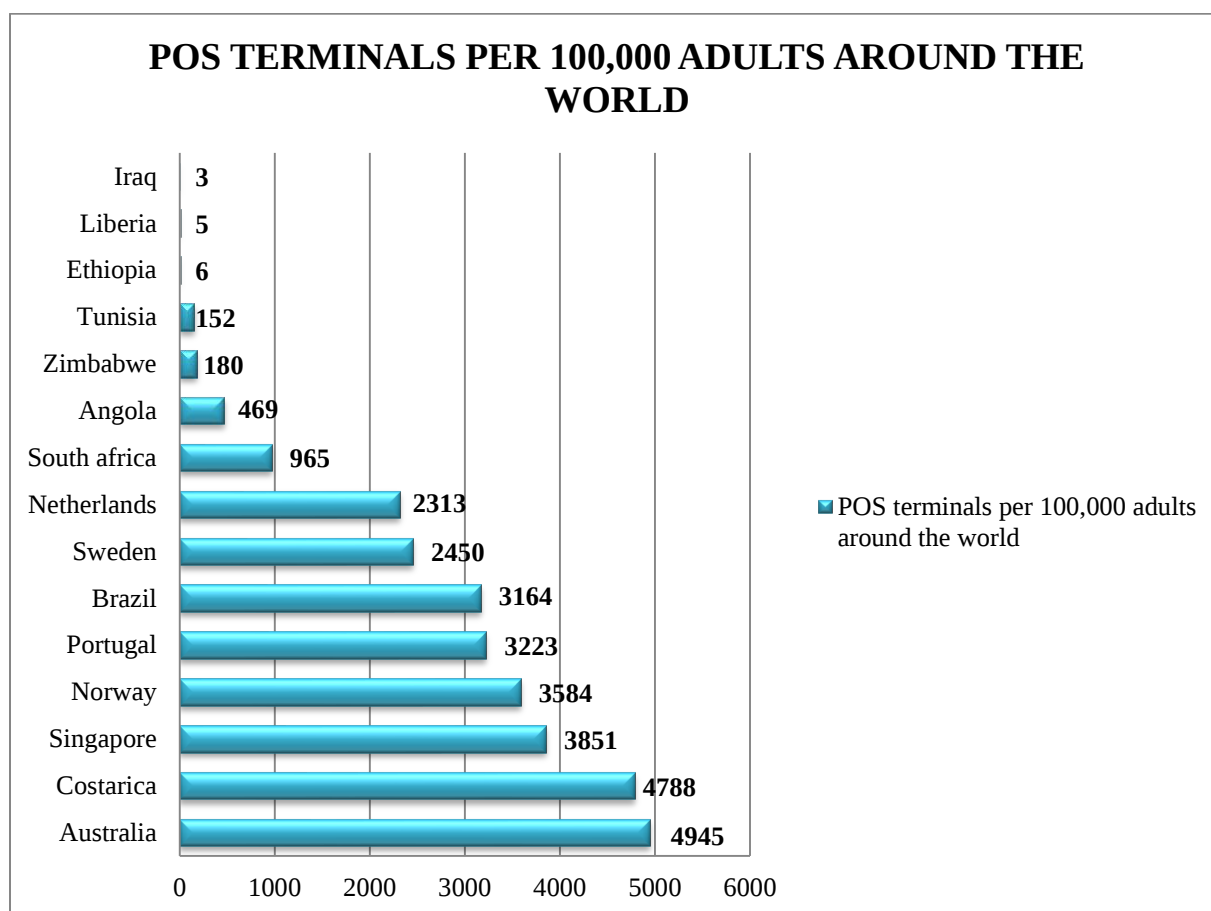


Source: The World Bank retrieved from ufa.worldbank.org/country-progress

As it is shown in the above graph Tanzania has higher number of ATMs than Ethiopia and Kenya. Kenya stood at second and Ethiopia is at last. When we come to the number crunch, Tanzania had 4 ATMs per 100,000 at 2010 and at 2015 they had more than 27 ATMs per 100,000. When we see the case of Kenya, Kenya had 8 ATMs per 100,000 in 2011 and they had 9.8 ATMs by 2015. Ultimately Ethiopia had 1 ATM per 100,000 in 2013 and had 2.1 ATMs per 100,000 adults at the end of 2015.

As we have said it in previous times, the main payment solution introduced to Merchants is POS machine. According to the World Bank group, the countries that have the most POS machines deployed are Australia with 4,945 and Costa Rica with 4,788 terminals per 100,000 adults. The country where few POS terminal were deployed was Iraq with 3 terminals. South Africa leads the African continent with 965 pos terminals deployed. As we can see from the figure below, Ethiopia's deployment is little beyond the countries that stood last.

Figure 11: POS terminals per 100,000 around the world



Source: Global payment System survey World Bank

When we come to another cashless payment mechanism comparison, in 2015, the World Bank group and the world economic forum collaborated to undertake a research to understand the digital payments gap globally, with the focus of B2B, P2B and B2P transactions of micro, small and medium retailers. As a part of the research, estimates for the size of the electronic vs, paper based transactions in the B2B, P2B and B2P small retail segments were obtained in over 160

countries. The data below are estimates from the quantitative part of the research. According to the researchers then, paper based transactions included cash and checks; and electronic transactions included fund transfers, card payment transactions and mobile money. P2B payments include retail sales, B2P payments include salary payments and B2B payments include immediate supplier payments. The table below shows what the findings were:

Table 4: Digital payments gap globally, with the focus of B2B, P2B and B2P transactions

Country	% of sales (P2B) made electronically	% of supplier payment (B2B) made electronically	% of wages (B2P) disbursed electronically
Ethiopia	15	32	18
Israel	50	64	62
Italy	52	75	64
Japan	63	82	69
Qatar	53	68	57
South Africa	29	48	50
Spain	52	73	72
UAE	49	69	67
Saudi Arabia	46	55	60
Brazil	31	48	57
China	20	40	39
South Africa	29	48	50
Egypt	18	31	32
Uganda	12	29	20
Kenya	14	27	17
Tanzania	15	30	17
India	14	26	22
Eritrea	9	26	19
Estonia	56	86	68
Pakistan	13	13	8
Lithuania	48	78	87

Source: Global payment System survey World Bank

To first give highlight about the above indicator, % of sales (P2B) made electronically indicates mode of payment in retail sales or in other words, mode of payment used by a person when he/she pays to a business entity in retail sales. With this regard Japan leads the way by scoring 63% of retail sales transactions made electronically. In relation to African countries, Botswana leads the way by 33% followed by South Africa 29%, Ghana 28%, Mauritius and Namibia at 27%. When our country's case is considered, the percentage of P2B made electronically is 15%. With this indicator Eritrea lags behind by scoring 9%.

When we come to business to business (B2B), it depicts immediate supplier payments or mode of payment when a business pays to a business. With this view Pakistan was the country where B2B transactions are highly entertained with paper instrument. The percentage of electronic B2B Transactions in the country stood 13%. The highest percentage with this regard goes to Estonia with 86% and Japan with 82% of payments made electronically. From Africa the list was led by Botswana scoring 53% followed by South Africa scoring 48% in payments made electronically. The percentage point of Ethiopia with this regard was 32%.

When we come to the final indicator B2P, it explains mode of salary payments by which wages are paid from business to person or employees. The country that stood at the top within the list was Lithuania having percentage point of 87% made electronically. The same data for our country stood at a point of 18%. The African continent with this regard is led by South Africa having score of 50%. In relation with this, I have below tried to show in brief what the percentage point with regard to B2B, P2B and B2P for eastern African countries looked like.

Figure 12: Percentage of sales person to business that is paper based and Percentage of sales person to business that are made electronically

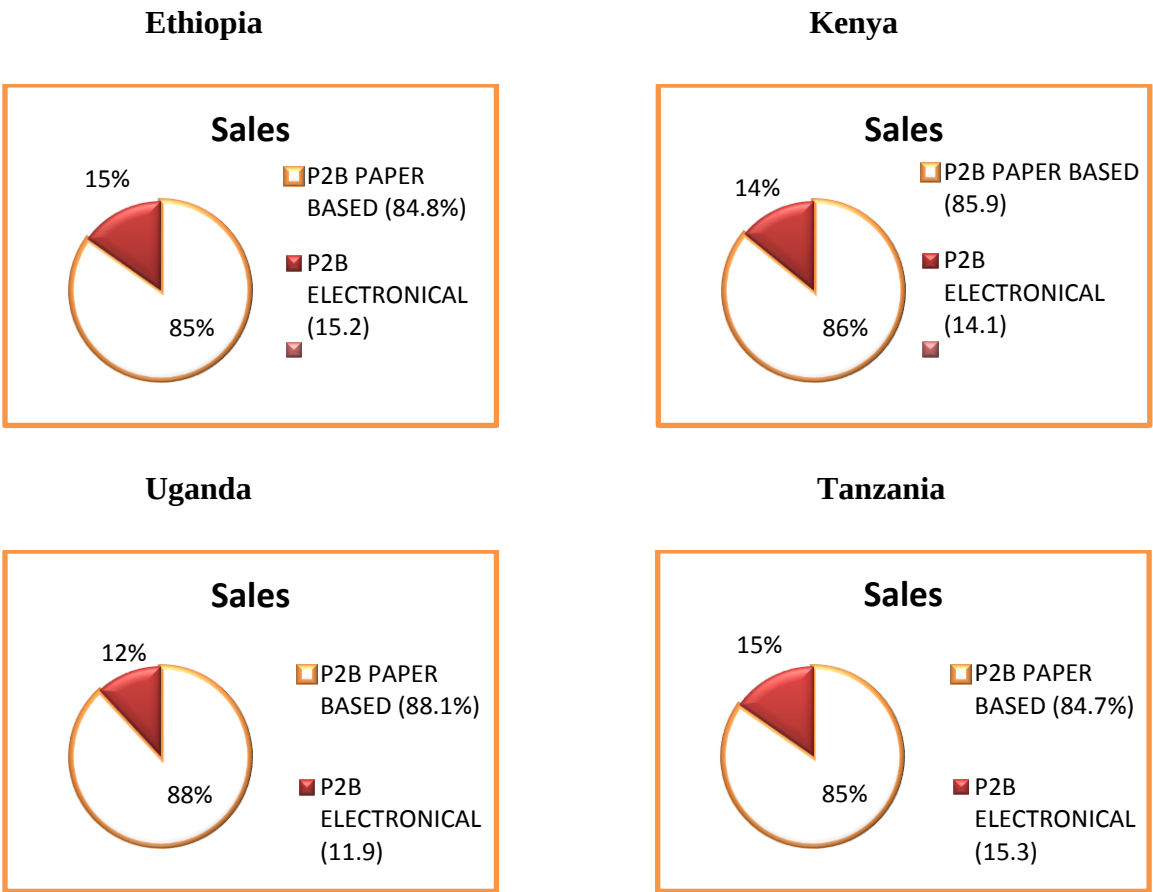


Figure 13: Percentage of supplier payments (business to business) that are paper based and Percentage of supplier payments (business to business) that are made electronically

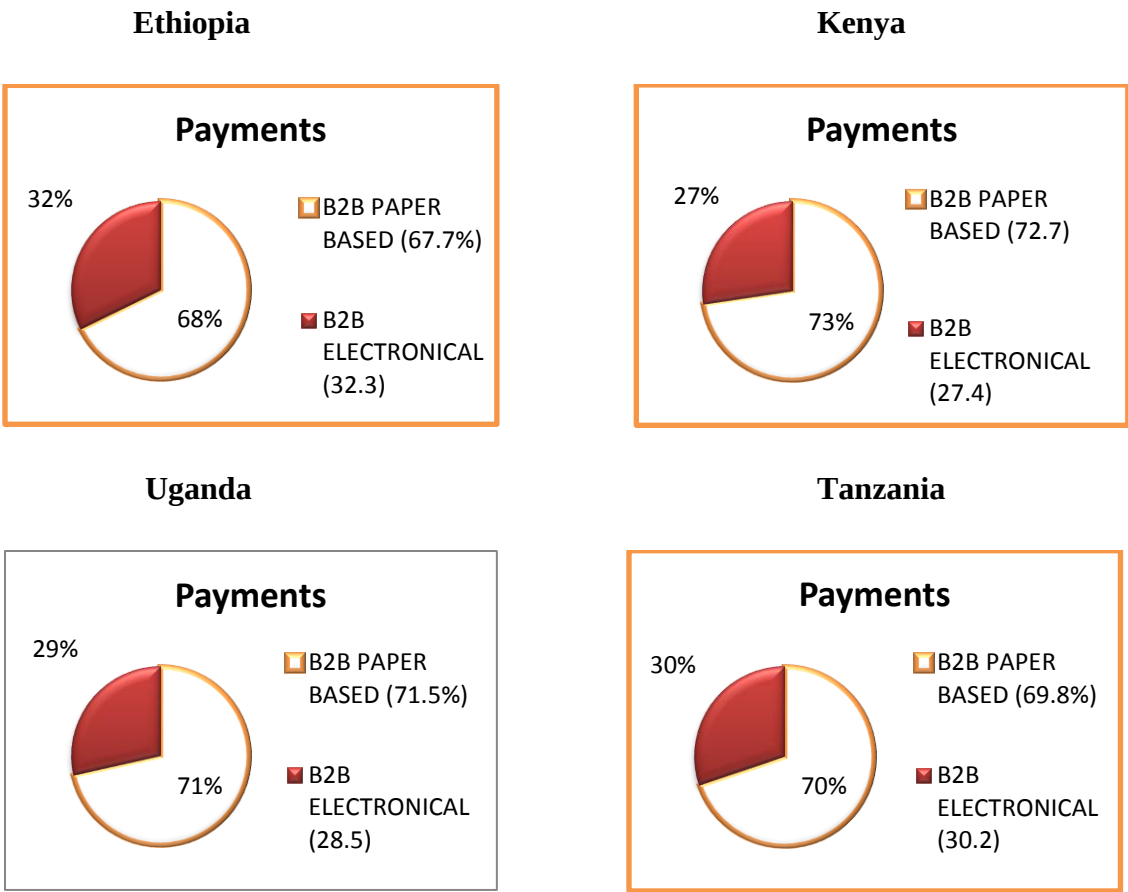
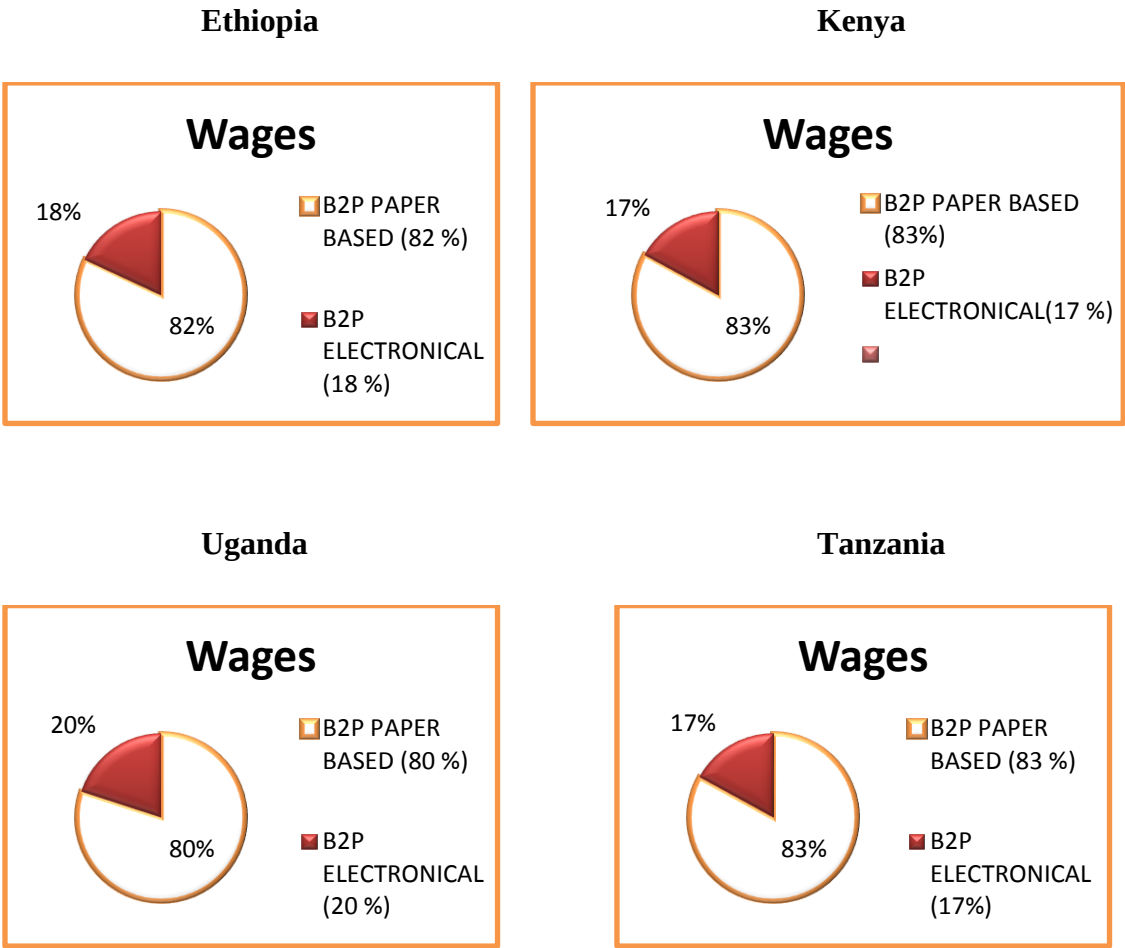


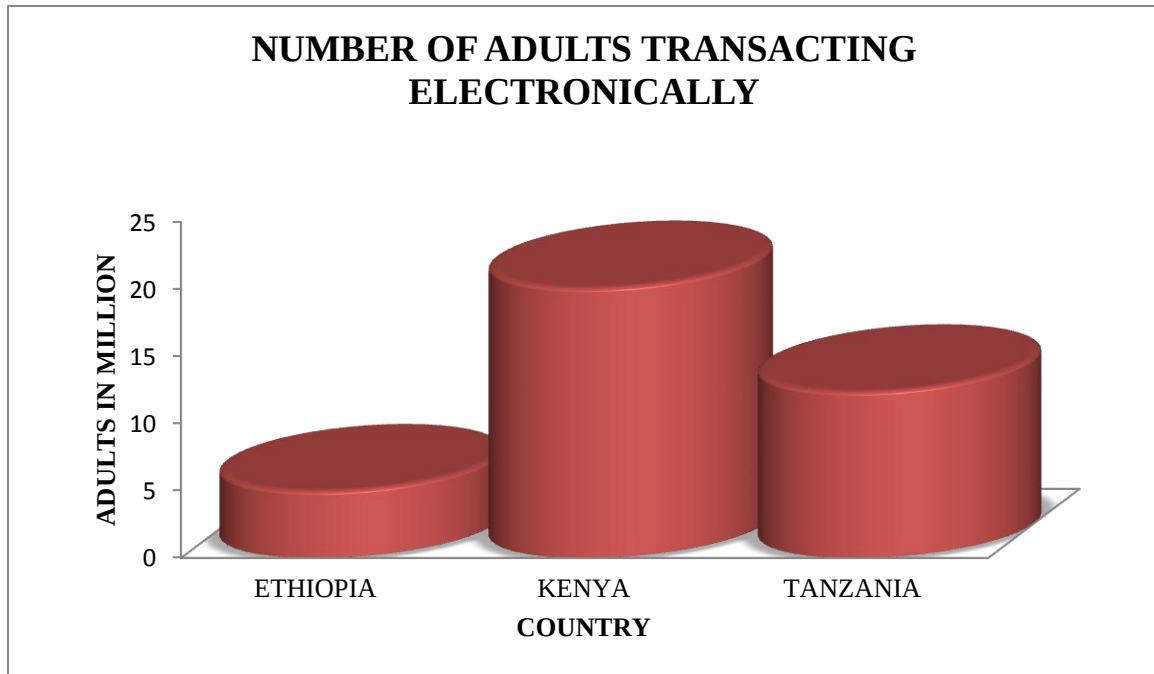
Figure 14: Percentage of wages (business to person) that are paper based and Percentage of wages (business to person) that are disbursed electronically



Source: Global payment System survey World Bank

As a final look we will below see the number of adults who use electronic payment instrument to transact basing three East African Countries.

Figure 15: number of adults who use electronic payment instrument to transact



Source: Global payment System survey World Bank

As it can be inferred from the above figure, the adults transacting electronically are well beyond double in Kenya and Tanzania compared with Ethiopia. Adults transacting electronically in Tanzania are above 12 million and in Kenya this number is more than 20 million. Thus, the number in Ethiopia is around 5 million.

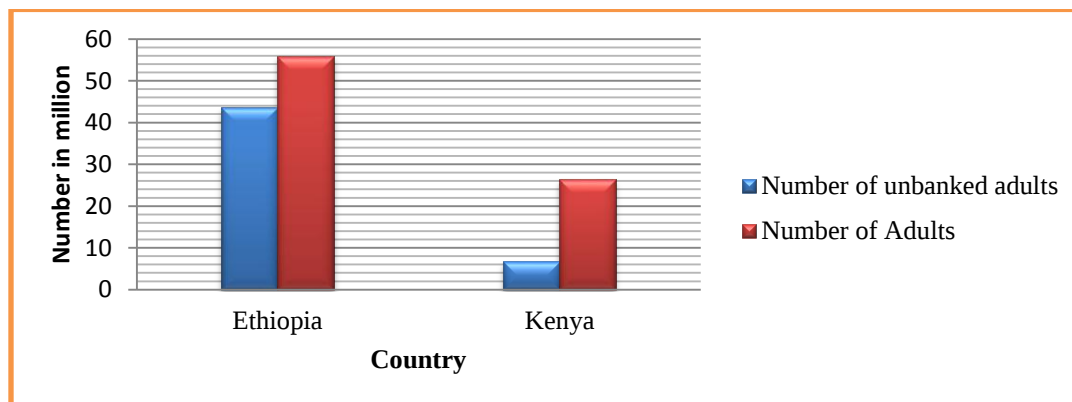
4.4. Readiness for cashless society

4.4.1. Access to financial services:

The notions that we are going to see are bank account (account at financial institution) and branch number. What was done here is comparison of Ethiopian case with best world practices and standards. The whole data here was gathered from secondary sources.

Mostly it is agreed financial inclusion at its most basic level starts with having a bank account. But it doesn't stop there- only with regular use do people fully benefit from having an account. Financial inclusion now a days is tremendously in the rise due to the reason that countries are trying to exploit new technological advancements to make their citizens users of financial services. Our neighbor to the south, Kenya for example is a notable country that can be brought to the front when financial inclusion issue is raised. Well this performance of the country is thanks to the mobile money service called M pesa. Not only in this, Kenya has made an excellent job in increasing the number of their unbanked adults. As it is shown in the figure below, Kenya has more than twenty five million adults and the adults that are unbanked are around 6.7 million (25%). When we come to the case of our country, we have 55.9 million adults and from this 43.7 million (78%) are unbanked. This shows, As it is important to add people in to the financial inclusion arena with technological advancements, it is also necessary to work on decrement of unbanked population by using formal banking services as Kenya is doing. Using both new technologies and previously used formal banking services adds to increment in financial inclusion.

Figure 16: Unbanked number of Adults in Ethiopia and Kenya



Source: The World Bank retrieved from ufa.worldbank.org/country-progress

When we come to another related case, According to NBE, Andualem Ufo Baza and K.Sambasiva (2017), financial institution indicators in Ethiopia at the end of the fiscal year 2015/2016 looked as what is indicated below:

Table: 5 Financial institution indicators in Ethiopia

No.	Indicator	Number in 2015/2016
1	Number of commercial banks	18
2	Private banks	16
3	Number of bank branches	3,187
4	Population/ Bank Branch	28,932
5	Number of micro finance institutions	35
6	Number of development banks	1
7	Number of development bank branches	110
8	Number of branches of microfinance institutions	1,593

Source: NBE, Andualem Ufo Baza and K.Sambasiva 2017

As it is indicated above, Ethiopia's banks have reached to 18 and microfinance institutions have reached 35 with 1,593 branches. The total bank branches have at the third quarter of 2015/2016 reached 3,187. This makes the total number of financial institution branches to be 4,780. As we have seen above, the total number of people in Ethiopia is around 106 million. Therefore, currently one financial institution branch serves 22,175.73 people. While this data is used as bank branch per 100,000 adults it becomes 4.5. According to the IMF 2014 world survey, the average bank branch per 100.000 people for that year's survey was 23.2 bank branches per 100,000. While our country's current case is considered, this is still below the 2014 average.

The country that had the most branches from Africa then was Zimbabwe having 12.96 per 100,000 people. Zimbabwe has a population of 16.7 million people and this indicates one branch serves around 7716 people and makes the total bank branches to be 2073. Our neighbor Kenya's share then was 5.8 branches per 100,000 people. If we calculate for how many people one bank branch is being served in Kenya it becomes 17241.3 people. The maximum result then was 256

branches per 100,000 adults in Colombia. If we calculate for how many people one branch is available in Colombia it becomes around 396 people. Close to cashless society countries France, Canada, Australia and Sweden scored 2631, 4166, 3448 and 4762 respectively. Our country at the time had 3093 branches for an adult population of 55 million and the branch number per 100,000 adults was around 5.54. *Andualem Ufo Baza and K.Sambasiva 2017*. As we have been seeing, the stage that we are in at this instance is below what the above countries were in 2014. This shows a lot work needs to be done with this regard.

According to the World Bank, number of transaction accounts per 1000 adults in Ethiopia stood 333 and number of deposit transaction accounts per 1000 adults are 284. Relating with this, other African and close to cashless society countries' data looked like as it is shown below:

Table: 6 number of transaction accounts and number of deposit transaction accounts per 1000 adults

Country	Number of transaction accounts per 1000 adults	Number of deposit transaction accounts per 1000	Population in million
Ethiopia	333	284	106
Rwanda	1872	752	12.3
South Africa	1630	1630	57
Japan	5884	3499	127
Sweden	2539	2539	9.9
Australia	2146	2146	24.7
China	6493	6493	1400

Source: Global payment survey World Bank

According to the whole data from which this table was taken, the countries Ethiopia was above in number were, Yemen Greece, Liberia and Israel. Here, it shall not be forgotten that one person may have more than one transaction or deposit transaction account and even both at the same time.

We have previously been seeing at what stage our country stands in access to financial services basing account at financial institution and branch number. As it was expressed in the introductory part, this Access to financial services is a factor for measuring the readiness for cashless society. Now let us move to other sub parts that are also indicators for readiness to cashless society. So, we will below see the results for security, regulatory, Cultural/Behavioral and Technology/ Infrastructure factors.

As we have previously mentioned repeatedly, in order to get an answer whether our country is ready for the creation of cashless society or not, self administered questionnaire was prepared basing the aforementioned factors. The results for the questionnaire are as indicated below.

4.4.2 Profile of respondents

The section below shows the demographic details of CSMs (Customer Services Managers) of Commercial Bank of Ethiopia (CBE) that participated in the research:

Table 7: Age of Respondents

Age					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	21-30	42	51.2	52.5	52.5
	31-40	34	41.5	42.5	95.0
	above 41	4	4.9	5.0	100.0
	Total	80	97.6	100.0	
Missing		2	2.4		
Total		82	100.0		

As it is indicated from the above table, more than half or 51.2 % of the respondents are between the ages of 21-30 and 41.5 % of the respondents are between the ages of 31-40. The remaining 4.9% respondents are above 41 years of age. There were people who didn't fill their age and they are considered as missed value constituting 2.4%.

Table 8: Gender of Respondents

Sex					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	22	26.8	27.5	27.5
	Male	58	70.7	72.5	100.0
	Total	80	97.6	100.0	
Missing		2	2.4		
Total		82	100.0		

When we come to the gender grouping of the respondents, 70.7% were male respondents and 26.8% of the respondents were female. There were people who didn't fill their gender and they have been considered as missed value which constituted the missed gender data to be 2.4%.

Table 9: Educational Background of CSMs

Educational Background					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	First Degree	47	57.3	58.0	58.0
	Second Degree >	34	41.5	42.0	100.0
	Total	81	98.8	100.0	
Missing		1	1.2		
Total		82	100.0		

As it is depicted from the above table, 57.3% of the respondents are holder of bachelor degree and 41.5% of the respondents are holders of second degree or above. The missed value here is 1.2%, which meant 1 respondent didn't fill his/her educational level.

Table 10: Work Experience of CSMs at the CBE

Work Experience at CBE					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	One - Five Year	21	25.6	27.3	27.3
	> 5 Years	56	68.3	72.7	100.0
	Total	77	93.9	100.0	
Missing		5	6.1		
Total		82	100.0		

When we come to work experience of respondents at CBE, the table above shows that 68.3% of the CSM respondents have served CBE for greater than five years. Other 25.6% have said they have worked in CBE between one up to five years. The respondents who failed to fill their work experience constituted 6.1%.

4.4.3 Security factors in relation with the creation of cashless society

A total of 12 questions were asked to know whether security issues relating to cashless society have been pleased or not. The questions were planned in a way to show the strength of the bank with the security factor within itself and also outside of it. These questions were designed in a way by which the respondents were asked their level of agreement on specific security related issues. These closed ended questions were rated in a five point likert scale ranging from “1” “Strongly Disagree” to “5” “Strongly agree”. In accordance with this, the researcher calculated the mean, median, standard deviation and inter-quartile range of data points. The summary of results of these security related questions is as shown below.

Table 11: Statistical Summary of Security factors affecting the creation of cashless society

	N		Mean	Median	Std. Deviation	IQR
	Valid	Missing				
Know how about advantage and disadvantage of digital payments	82	0	3.93	4	1.028	1
Having adequate knowledge on security risk issues to take care	82	0	3.87	4	1.028	0
Having knowledge about obligations and rights	82	0	3.82	4	0.944	1
Adequate Personnel having skill about cyber security	82	0	3.44	3	1.055	1
Well working and effective risk assessment tools towards tackling cyber security threats	82	0	3.73	4	0.861	1
Information gathering tools on new threats or developments towards cyber security	82	0	3.83	4	0.783	1
Strategy for helping customers on something wrong happens in using payment solutions	82	0	3.74	4	1.016	1
Strong bondage with security & intelligence bodies of our country	82	0	3.98	4	0.769	0
Frequently updated security frameworks	82	0	3.78	4	0.861	1
Strong bondage with security & intelligence bodies of the world	82	0	3.54	3	0.670	1
Best consulting firms having best expertise in cyber security	82	0	3.48	3	0.878	1
Frequent alerting on customers and staff about new developments and threats towards cyber security	82	0	3.23	3	1.034	1

As it is shown above, the valid column relates to number of respondents who provided answer for each corresponding question. The mean and median try to tell the average where the data points fall for each specific variable. Relating with this, the standard deviation and the inter quartile range column show the variability of the data points for every variable.

This being said, we will below see the degree to which respondents agreed and disagreed to each of the security related questions.

Table: Sec 1

Knowing about advantages and disadvantages of CLPM					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	3.7	3.7	3.7
	Disagree	7	8.5	8.5	12.2
	Undecided	7	8.5	8.5	20.7
	Agree	41	50.0	50.0	70.7
	strongly Agree	24	29.3	29.3	100.0
	Total	82	100.0	100.0	

Table (**Sec 1**) shows if respondents have general consensus about customers' knowhow on the advantage and disadvantage of digital payments. As it is inferred from the summary table, the standard deviation is 1.028 which is greater than 1 indicating data points are not close to the mean. However, mean value of 3.93 indicates that there was general consensus between most respondents that customers are made to have adequate knowledge about the advantages and disadvantages of digital payments while becoming first users of cashless payment solutions.

Table: Sec 2

Adequate knowledge on security risk issues					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	5	6.1	6.1	6.1
	Disagree	4	4.9	4.9	11.0
	Undecided	7	8.5	8.5	19.5
	Agree	47	57.3	57.3	76.8
	Strongly Agree	19	23.2	23.2	100.0
	Total	82	100.0	100.0	

The next question on the security theme was whether customers have adequate knowledge on security risk issues that they should take care on or not. Hence, the results portrayed standard deviation of 1.028 indicating respondent's opinion towards this question was diverse. However, the mean became 3.87 indicating many of the respondents believe customers are made to be aware on the security risk issues they should take care on while becoming users of cashless payment solutions.

Table: Sec 3

Made to be aware of their rights and obligations					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	10	12.2	12.2	12.2
	Undecided	15	18.3	18.3	30.5
	Agree	37	45.1	45.1	75.6
	Strongly Agree	20	24.4	24.4	100.0
	Total	82	100.0	100.0	

The third security issue needed to be raised was whether customers are made to be aware of their rights and obligations or not. Relating to this, the standard deviation which became 0.944 designated that respondents didn't have different opinion on the issue of acknowledging

customers about their obligation and rights towards cashless payment solutions. In relation with this, the mean to this question was 3.82 signifying the consensus of respondents that customers are made to be aware about their obligation and rights before they become users of CBEs cashless payment solutions.

In raising the above three security related questions, the researcher's main intent was observing if customers are made to have adequate knowledge about cashless payment solutions before becoming users. As we have seen in the results, there is a consensus that customers become users of cashless payment solutions after having full knowledge about the risks they should take care on, the benefits they are going to reap, the drawbacks they may encounter

Table: Sec 4

Adequate Personnel with skill about cyber security					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	2.4	2.4	2.4
	Disagree	13	15.9	15.9	18.3
	Undecided	30	36.6	36.6	54.9
	Agree	21	25.6	25.6	80.5
	Strongly Agree	16	19.5	19.5	100.0
	Total	82	100.0	100.0	

The next question asks whether Adequate Personnel having skill about cyber security are available at the bank. Hence, the mean for this question was 3.44 indicating there are adequate personnel in the bank having skill towards cyber security. When we see the standard deviation, it became greater than 1 indicating respondents' believe on the issue was different. This issue was raised to know if the security related knowledge that the service requires is being fulfilled within the personnel of the bank. Thus, the results indicated there is enough of it.

Table: Sec5

Well working and effective risk assessment tools towards tackling cyber threats					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	1.2	1.2	1.2
	Disagree	4	4.9	4.9	6.1
	Undecided	26	31.7	31.7	37.8
	Agree	36	43.9	43.9	81.7
	Strongly Agree	15	18.3	18.3	100.0
	Total	82	100.0	100.0	

This question was asked to know whether well working and effective risk assessment tools towards tackling cyber security threats are readily available at the bank. Hence, the respondents had consensus on their reply since the standard deviation was less than 1 or 0.861. Thus, mean value of 3.73 indicates the respondents agreed there are well working and effective risk assessment tools that can tackle cyber threat.

As we might presume the **dynamics** in cyber security is very volatile. The defense mechanisms that you put in place today might not work the following day. In order to cope up with the volatility of these dynamics, the skill of presuming what may happen is a necessary quality. Hence, the researcher's main intent here was assuring if there are such kinds of tools that help to identify what might happen in the future. The results to this effect showed there are such tools in the bank.

Table: Sec 6

Information gathering tools on cyber threats					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	3	3.7	3.7	3.7
	Undecided	24	29.3	29.3	32.9
	Agree	39	47.6	47.6	80.5
	Strongly Agree	16	19.5	19.5	100.0
	Total	82	100.0	100.0	

For the question that raised the issue on whether there are information gathering channels about threats and new cyber security developments, the standard deviation 0.783 indicates the respondents' degree of having the same view on the issue was high. Staying With the same topic, the mean value to this question 3.83 implied respondents agreed on the matter that information gathering channels about threats and new developments on cyber security are available at the bank. In the previous question what we have seen was the probability of something happening in the future or the "to come" scenario. However at this question what the researcher needed to see was how well the bank works on identifying "the now" circumstances. This is about having information on threats that might cause problem at an instance. Hence the results showed the bank also has information gathering tools that try to identify what is happening now in cyber security and what threats are there at that instance.

Table: Sec 7

Strategy for helping customers					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	3.7	3.7	3.7
	Disagree	8	9.8	9.8	13.4
	Undecided	13	15.9	15.9	29.3
	Agree	41	50.0	50.0	79.3
	Strongly Agree	17	20.7	20.7	100.0
	Total	82	100.0	100.0	

Table (Sec 7) shows the result for the security issue of having a supporting strategy when something goes wrong while customers are using cashless payment solutions. Even if the standard deviation 1.016 which is greater than 1 indicates data points are dispersed from the mean, the mean value 3.74 indicates respondents believe there is such strategy in the bank.

Some inconveniences might happen when customers are using a cashless payment solution. For example a person using internet banking might be using out dated software, not secured wi fi connection or not strong password and something like these. The researcher's main intention here was to identify what immediate security measures are taken to minimize the severity of a security breach that has already happened due to the aforementioned user created inconveniences. In the same token, what support is there after security of users has been breached after been a victim of cyber threat due to the aforementioned reasons? As the results indicated there is supporting strategy by the bank for things going wrong before they create higher problems.

Table: Sec 8

Bondage with intelligence and security bodies of the country					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	4	4.9	4.9	4.9
	Undecided	13	15.9	15.9	20.7
	Agree	46	56.1	56.1	76.8
	Strongly Agree	19	23.2	23.2	100.0
	Total	82	100.0	100.0	

The above table portrayed the degree to which respondents agreed to the question that raised the issue of having Strong bondage with security & intelligence bodies of our country. The standard deviation for this specific question 0.769 implied respondents have strong consensus on the topic area. The mean value 3.98 shows the respondents mostly agreed on the topic that the bank has strong bondage with security apparatus of our country.

Table: Sec 9

Security frameworks updated frequently					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	5	6.1	6.1	6.1
	Undecided	26	31.7	31.7	37.8
	Agree	33	40.2	40.2	78.0
	Strongly Agree	18	22.0	22.0	100.0
	Total	82	100.0	100.0	

With respect to frequently updating security frameworks of the bank, the mean value indicates respondents believed the frameworks are updated frequently. In relation with this, standard deviation less than 1 to this issue shows most respondents have the same type of response. The mean for this issue was 3.78 and standard deviation was 0.861. As we have been discussing above, the dynamics of this cashless payment service is very volatile. This is due to the reason that banks are on continual competition basing technological advancements. Since technological advancements go hand in hand with the security part, as the technology changes the security it demands also changes with it. This is what we call changing security framework.

Table: Sec 10

Bondage with intelligence and security bodies of the world					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	2	2.4	2.4	2.4
	Undecided	40	48.8	48.8	51.2
	Agree	34	41.5	41.5	92.7
	Strongly Agree	6	7.3	7.3	100.0
	Total	82	100.0	100.0	

Table (Sec 10) depicted the degree to which respondents agree on the issue of the bank having strong relationship with security and intelligence bodies of the world. The mean to this value 3.54 indicated respondents believed CBE works with and has strong bondage with security and

intelligence bodies around the world. Since the standard deviation was less than 1, it is indicated respondents have consensus with the issue.

Table: Sec 11

Consulting firms with best expertise					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	1.2	1.2	1.2
	Disagree	7	8.5	8.5	9.8
	Undecided	37	45.1	45.1	54.9
	Agree	26	31.7	31.7	86.6
	Strongly Agree	11	13.4	13.4	100.0
	Total	82	100.0	100.0	

The next issue that the researcher was interested in and believed can show security strength of the bank was the issue of having consulting firms that have best expertise in relation with cyber security. The respondents with consensus believed the bank has these consulting firms. This can be assured by the mean 3.43 and standard deviation 0.878.

The issues raised in table sec 8, 10, and 11 tried to understand how well the security apparatus of the bank is supported by other external bodies that have the capacity than it does. If the support of these bodies is not present, there can almost be nothing that the bank can do by its self in securing cashless payment solutions. Hence, it is clear that the bank should have strong bondage with our country's, and world's security bodies and also with security consulting firms. Thus, the results show that the bank had these bondages.

Table: Sec 12

Alerting, teaching customers and staff about new security dev't					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	4	4.9	4.9	4.9
	Disagree	16	19.5	19.5	24.4
	Undecided	27	32.9	32.9	57.3
	Agree	27	32.9	32.9	90.2
	Strongly Agree	8	9.8	9.8	100.0
	Total	82	100.0	100.0	

The final question relating with security focused on knowing whether customers and staff of the bank are frequently taught and alerted about new developments and threats towards cashless payment solutions or not. Respondents agreed this is a frequently done task by the bank. This conclusion was reached since the mean was 3.23. Even if most of the respondents agreed on the topic, the standard deviation shows variability between the beliefs of the respondents.

4.4.4 Regulatory factors in relation with the creation of cashless society

A total of 10 questions were asked to know whether regulatory issues relating to cashless society have been pleased. The questions were planned in a way that can show the strength of the regulatory factor within the observed bank in its self and also with outside effects. These questions were designed in a way by which the respondents were asked their level of agreement on specific issues. Theses closed ended questions were rated in a five point likert scale ranging from “1” “Strongly Disagree” to “5” “Strongly agree”. In accordance with this, the researcher calculated the mean, median, standard deviation and inter-quartile range of data points. The summary of results of these regulatory related questions is as shown below.

Table 12: Statistical Summary of Regulatory factors affecting the creation of cashless society

	N		Mean	Median	Std. Deviation	IQR
	Valid	Missing				
More enabling regulatory frameworks established by government	82	0	3.63	4	0.839	1
Regulation allows service to be provided in sustainable way	82	0	3.96	4	0.793	0
Ambiguities and loopholes in the rules by bank	82	0	3.46	4	1.009	1
Working in accordance with rules established by CBE	82	0	3.83	4	0.927	0
Rules forcing improvements and upgrade of service	82	0	4.15	4	0.818	1
Rules consisting performance standards	82	0	4	4	0.861	1
Rules encouraging innovation	82	0	3.98	4	0.860	1
Rules permitting flexibility to choose method of compliance	82	0	3.44	4	0.944	1
Rules and regulations that protect all actors	82	0	3.71	4	0.896	1
Understanding all terms and condition while filling forms	82	0	3.30	4	1.234	2

Table: Reg 1

More enabling regulatory frameworks					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	8	9.8	9.8	9.8
	Undecided	25	30.5	30.5	40.2
	Agree	38	46.3	46.3	86.6
	Strongly Agree	11	13.4	13.4	100.0
	Total	82	100.0	100.0	

The first question in relation with regulation asked respondents whether there existed more enabling regulatory frameworks in our country in relation with cashless payment solutions or not. Thus, the mean value 3.63 implied there are enabling regulatory frameworks established by the government. Relating to this, standard deviation of 0.839 which is less than one implies there exists consensus between the respondents on their level of agreement.

Table: Reg 2

Regulation allowing service to be provided sustainably					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	5	6.1	6.1	6.1
	Undecided	12	14.6	14.6	20.7
	Agree	46	56.1	56.1	76.8
	Strongly Agree	19	23.2	23.2	100.0
	Total	82	100.0	100.0	

The table above shows respondent's level of agreement on whether regulation towards cashless payment solutions enables service to be provided in a sustainable way or not. The respondents' reply shows their level of agreement on the issue was similar. This is figured out since the standard deviation on this specific issue was less than 1. On the other hand the mean value became 3.96 showing that respondents believe regulation towards cashless payment solutions enables service to be provided in sustainable way.

The first and the second questions in the regulation sub part were raised to get a clue on whether our country has workable regulations that do not have rigidity in them. As we may guess if rules are rigid and they **change every time**, they would make the provision of the service disrupted now and then. As it was indicated from the results, the regulations in our country towards cashless payment solutions do not have these negative characteristics.

Table: Reg 3

Loopholes in rules of the bank					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	20	24.4	24.4	24.4
	Undecided	15	18.3	18.3	42.7
	Agree	36	43.9	43.9	86.6
	Strongly Agree	11	13.4	13.4	100.0
	Total	82	100.0	100.0	

Table (Reg 3) shows the result on the regulation issue on whether Ambiguities and loopholes are observed in the cashless payment rules of the bank. Accordingly, the respondents believed there is vagueness in the rules of the bank towards cashless payment solutions. However the standard deviation was beyond 1 and this shows there was low consensus between the respondents on the issue. Even if the regulations in the country do have the above mentioned positive aspects, the results show the rules in the bank towards cashless payment solutions are vague.

Table: Reg 4

Working in accordance with rules established					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	1.2	1.2	1.2
	Disagree	9	11.0	11.0	12.2
	Undecided	10	12.2	12.2	24.4
	Agree	45	54.9	54.9	79.3
	Strongly Agree	17	20.7	20.7	100.0
	Total	82	100.0	100.0	

For this question which asked respondents on whether staff of the bank Work in accordance with rules established by the bank or not, respondents believe staff of the bank work in agreement with the rules of cashless payment solutions. This is spotted by the mean which is 3.83. The standard deviation on this issue was less than one as seen above implying data points are close to the mean. As we have expressed it previously, even if the rules of the bank have ambiguities, the staffs of the bank perform in accordance with the rules. This indicates all staffs of the bank interpret some of the rules as they wish and they follow their own definition in performing.

Table: Reg 5

Rules intended to force banks upgrade and improve					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	1.2	1.2	1.2
	Disagree	2	2.4	2.4	3.7
	Undecided	10	12.2	12.2	15.9
	Agree	40	48.8	48.8	64.6
	Strongly Agree	29	35.4	35.4	100.0
	Total	82	100.0	100.0	

Table (Reg 5) shows the result for the question which asked respondents to give their level of agreement on the issue of having Rules forcing improvements and upgrade of service. Thus, the respondents agreed there are rules which force improvements and upgrades of cashless payment solutions from time to time. This is inferred since the mean was 4.15. The response of the respondents was mostly similar as the standard deviation was less than 1 or 0.818.

Table: Reg 6

Rules consist performance standards that banks should follow					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	1.2	1.2	1.2
	Disagree	4	4.9	4.9	6.1
	Undecided	12	14.6	14.6	20.7
	Agree	42	51.2	51.2	72.0
	Strongly Agree	23	28.0	28.0	100.0
	Total	82	100.0	100.0	

To the issue that asked about the Rules consisting performance standards towards cashless payment solutions, the mean value was 4 and the standard deviation was 0.861. This in other words mean with high level of consensus respondents believed there are rules having performance standards to comply with.

Table: Reg 7

Rules encouraging innovation					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	1.2	1.2	1.2
	Disagree	3	3.7	3.7	4.9
	Undecided	16	19.5	19.5	24.4
	Agree	39	47.6	47.6	72.0
	Strongly Agree	23	28.0	28.0	100.0
	Total	82	100.0	100.0	

The next question asks whether the rules towards cashless payment solutions encourage innovation or not. With standard deviation of 0.860, we can make sure respondents' opinion is highly similar. The mean value 3.98 implies there was an agreement between most respondents that there are rules that encourage innovation in cashless payment solutions.

The topics in the above three questions come to the things we have been discussing above. As we have said it above, the provision of cashless payment solutions involves not only printing and controlling the circulation of cash as it is done in cash type of payment. Since cashless payment solutions are interrelated with technology, they should base their provision on frequent and ongoing improvement and ongoing fulfillment of performance standards. Even if banks by themselves go through improvement for their own competitiveness, the government also needs the introduction of modern payment systems in the country and it should also force banks to make these improvements if they do not make them for their own sake. As the results indicated there are performance standards that banks should follow and there are also cashless payment solution rules that force banks to make improvements. In relation with this, since improvement go side by side with innovation, the results also indicate there are also rules that encourage innovation.

Table:Reg 8

Flexibility to choose methods of compliance					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	3.7	3.7	3.7
	Disagree	10	12.2	12.2	15.9
	Undecided	24	29.3	29.3	45.1
	Agree	38	46.3	46.3	91.5
	Strongly Agree	7	8.5	8.5	100.0
	Total	82	100.0	100.0	

The other regulatory question asked was whether the rules towards cashless payment solutions permit flexibility to choose method of compliance. Standard deviation of this particular question was less than 1 or 0.944 indicating there was consensus between respondents that they agreed flexibility to choose method of compliance is possible in the rules towards cashless payment solutions. The mean to this question is 3.44.

In western countries there is a regulatory approach named as comply or explain. This approach prefers not setting binding laws rather companies may comply with or if they do not comply, explain publicly why they do not comply. This approach rejects the belief “one fits all” The level of flexibility couldn’t get to this stage as we might presume in our country. However, flexibility allows the law to adapt to changing needs and circumstances. If a law is too rigid, it is likely to collapse under the weight of change.

Table: Reg 9

Rules protect all actors					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	2.4	2.4	2.4
	Disagree	5	6.1	6.1	8.5
	Undecided	21	25.6	25.6	34.1
	Agree	41	50.0	50.0	84.1
	Strongly Agree	13	15.9	15.9	100.0
	Total	82	100.0	100.0	

Table (Reg 9) above shows the level of agreement and disagreement that respondents have on the issue of having cashless payment solution rules and regulations that protect all actors or participants. According to the respondents, with most of them having similar opinion, the rules and regulation towards cashless payment solutions can protect all stakeholders that participate. This conclusion is inferred from a mean value of 3.71 and standard deviation of 0.896.

Table: Reg 10

Understanding all terms and conditions					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	8	9.8	9.8	9.8
	Disagree	16	19.5	19.5	29.3
	Undecided	14	17.1	17.1	46.3
	Agree	31	37.8	37.8	84.1
	Strongly Agree	13	15.9	15.9	100.0
	Total	82	100.0	100.0	

Even if the opinion towards the last regulatory question was highly variant (with standard deviation of 1.234), the mean value of 3.3 shows respondents believe customers are made to fill forms after they Understand all terms and conditions. This issue interrelates with the topic that we raised in security factor of making customers know about a cashless payment solution before becoming user of it. The results in both security and regulatory cases indicate the same type of answer or support that customers are made to have know how before they become users of cashless payment solution.

4.4.5. Cultural and behavioral Factors in relation with the creation of cashless society

Changing an attitude or way of life that has been accustomed with a person is a difficult task. As it can be figured from the above table, most of the standard deviation to most of the questions asked was greater than 1; this indicates respondents' level of agreement to these cultural issues was different. However, we will take what the mean value tells us. Below, I tried to show the agreement or disagreement of the respondents to 12 questions that were prepared in relation with the Cultural factors thought to be affecting the creation of cashless society. I believe this shows whether Cultural issues relating to cashless society have been fulfilled or not. The questions were planned in a way that can show the strength of the cultural factor within the observed bank in its self and also outside of it. These questions were designed in a way by which the respondents were asked their level of agreement on specific cultural issues. These closed ended questions were rated in a five point likert scale ranging from "1" "Strongly Disagree" to "5" "Strongly agree". In accordance with this, the researcher tried to calculate the mean, median, standard deviation and inter quartile range of data points. The summary of results of these cultural and behavioral related questions is as shown below

Table 13: Statistical Summary of Cultural factors affecting the creation of cashless society

	N		Mean	Median	Std. Deviation	IQR
	Valid	Missing				
Customers Have heard about cashless society	82	0	3.48	4	1.157	2
Feeling legal tender shall be replaced by cashless Economy	82	0	2.95	3	1.017	2
Current Availability of CBE ATMs satisfactory	82	0	3.49	4	1.057	1
Rapid uptake of cashless payment solutions	82	0	3.68	4	1.029	1
Feeling that cashless payment solutions violate privacy (customers)	82	0	2.91	3	1.199	2
Sales boosted to merchants by the help of the discount given by the bank when cashless payment solutions are used.	82	0	3.56	4	0.957	1
High psychology to physically hold and touch cash	82	0	3.96	4	0.838	1
Point Of sale machine is easily operable to merchants	82	0	3.40	4	1.029	2
High level of insistence to use cash even if recruited to cashless payment solutions	82	0	3.95	4	0.888	1
Customers feel modernized when using cashless payment solutions	82	0	3.79	4	0.952	1
Small gap between activation and recruitment on cashless payment solutions	82	0	3.18	4	1.208	2
Becoming users of cashless payment solutions by willingness	82	0	3.27	4	1.287	2

Table: Cul 1

Customers Have heard about cashless society					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	4	4.9	4.9	4.9
	Disagree	17	20.7	20.7	25.6
	Undecided	12	14.6	14.6	40.2
	Agree	34	41.5	41.5	81.7
	Strongly Agree	15	18.3	18.3	100.0
	Total	82	100.0	100.0	

The first question that was asked in the cultural sub part was whether branch's customers that the respondents belong to have heard about cashless society or not. In relation with this the standard deviation became 1.157 or greater than 1 implying the data points are not close to the mean. However since the mean value is 3.48, it is inferred most of the respondents believed most of their customers have heard about cashless society. This idea was raised to know if in the first place customers have heard about the topic that I rose. As the results indicated most of customers in branches have the idea on what cashless society mean.

Table: Cul 2

Feeling legal tender shall be replaced by cashless Economy					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	6	7.3	7.3	7.3
	Disagree	21	25.6	25.6	32.9
	Undecided	31	37.8	37.8	70.7
	Agree	19	23.2	23.2	93.9
	Strongly Agree	5	6.1	6.1	100.0
	Total	82	100.0	100.0	

For the question that asked the opinion of the respondents on whether their customers' belief on replacing cash as a legal tender and replacing it with cashless payment solutions is a supported fact, the result shows respondents became indifferent since the mean to this question was 2.95.

However most of them or 27% disagreed. May the case be like this in relation with the mean, the standard deviation which is greater than 1 or 1.017 indicates there is a level of difference between the opinion of the respondents. This indicates customers are not yet sure whether to abolish cash as legal tender or not. However most of them need cash to stay in the circulation and be the legal tender.

Table: Cul 3

Current Availability of CBE ATMs satisfactory					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	3.7	3.7	3.7
	Disagree	15	18.3	18.3	22.0
	Undecided	14	17.1	17.1	39.0
	Agree	39	47.6	47.6	86.6
	Strongly Agree	11	13.4	13.4	100.0
	Total	82	100.0	100.0	

Table (Cul 3) shows the opinion of the respondents on the level of satisfaction on the availability of ATMs. This question was thought at first to answer the question “is it due to the unavailability of ATMs or due to customer’s preference that ATMs are being used or not used.” If the answer is the number of ATMs is satisfactory, then preference is making customers not go to ATMs but tellers. Hence, most of the respondents believed the availability of ATMs is satisfactory and this indicates availability of ATMs couldn’t be a factor for using tellers than ATMs.

Table: Cul 4

Rapid uptake of cashless payment solutions					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	2.4	2.4	2.4
	Disagree	14	17.1	17.1	19.5
	Undecided	6	7.3	7.3	26.8
	Agree	46	56.1	56.1	82.9
	Strongly Agree	14	17.1	17.1	100.0
	Total	82	100.0	100.0	

The other question in the cultural or behavioral factor was the issue that raised Rapid uptake of cashless payment solutions. Most of the respondents agreed there is rapid uptake since the mean value was 3.68. However, the standard deviation 1.029 indicates data points are disseminated from the mean. Rapid uptake of a cashless payment solution in the researcher's belief indicates an attitude of preferring cashless payment solutions than cash. This means customers have good attitude towards cashless payment solutions.

Table: Cul 5

Feeling that cashless payment solutions violate privacy (customers)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	6	7.3	7.3	7.3
	Disagree	34	41.5	41.5	48.8
	Undecided	13	15.9	15.9	64.6
	Agree	19	23.2	23.2	87.8
	Strongly Agree	10	12.2	12.2	100.0
	Total	82	100.0	100.0	

One factor that was thought by the researcher as a factor making customers not to use cashless payment solutions was the violation of privacy. In relation with this, the respondents were asked whether customers think cashless payment solutions violate their privacy or not. Hence, most respondents believed their customers do not think their privacy is violated. This is inferred from 48.8% of respondents lying in the disagreement part. However the standard deviation is greater than 1 indicating the respondents' level of consensus was not that much close to the mean.

Table: Cul 6

Sales boosted to merchants by the help of the discount given by the bank					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	1.2	1.2	1.2
	Disagree	11	13.4	13.4	14.6
	Undecided	24	29.3	29.3	43.9
	Agree	33	40.2	40.2	84.1
	Strongly Agree	13	15.9	15.9	100.0
	Total	82	100.0	100.0	

CBE has a strategy for users of its cards to get a discount rate of an agreed amount if they purchase using cards from CBE's partners (merchants). Hence, if a person buys with the CBE debit card, he/she gets a discount amount that is paid by the bank. Even if the discount is to the buyer or card holder, thinking buyers will get a discount, they would prefer to buy from a merchant that has an agreement with CBE. By return, the sales of the merchants would also increase. Thus, as it can be seen by a mean value of 3.56 most of the respondents agreed this discount rate has made sales of agents having an agreement with the bank to boost. This can infer the discount rate is changing the attitude of other cash related merchants to get into cashless payments solutions like pos since their sales would also rise. this issue has consensus between the respondents since the standard deviation is 0.957

Table: Cul 7

Psychology to physically hold and touch cash					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	6	7.3	7.3	7.3
	Undecided	12	14.6	14.6	22.0
	Agree	43	52.4	52.4	74.4
	Strongly Agree	21	25.6	25.6	100.0
	Total	82	100.0	100.0	

There are people who are used to be satisfied with sales if they only see and touch the cash. This is why there is an old saying in Amharic that goes as “ej be’ej fikir endiderej”. Literally meaning people would like one another if they give and take their offerings at a specific moment. In relation with this, respondents were asked if merchants need to touch and see the cash rather than being paid by cashless means. The respondents believed merchants do have this behavior of being satisfied if they touch and see cash. Since the standard deviation was less than 1 or 0.838 we can be sure that the level of consensus between the respondents was high. Mean value to this question was 3.96.

Table: Cul 8

Point Of sale machine is easily operable to merchants					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	1.2	1.2	1.2
	Disagree	21	25.6	25.6	26.8
	Undecided	13	15.9	15.9	42.7
	Agree	38	46.3	46.3	89.0
	Strongly Agree	9	11.0	11.0	100.0
	Total	82	100.0	100.0	

Even if the consensus between them is less with the issue, respondents think merchants believe POS machines are easily operable and user friendly. This in other words can mean customers are willing to use cashless payment solutions but the difficulty in operating the cashless payment solutions may hinder them from doing so.

Table: Cul 9

High level of insistence to use cash even if recruited to cashless payment solutions					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	1.2	1.2	1.2
	Disagree	6	7.3	7.3	8.5
	Undecided	10	12.2	12.2	20.7
	Agree	44	53.7	53.7	74.4
	Strongly Agree	21	25.6	25.6	100.0
	Total	82	100.0	100.0	

This question was trying to figure out what customers prefer even after they become the users of cashless payment solutions. Thus, respondents believed there is High level of insistence to use cash even if recruited to cashless payment solutions. This indicates old habits die hard. The mean to this question was 3.96 and the standard deviation is 0.888. The standard deviation tells the data points are close to the mean.

Table: Cul 10

Customers feel modernized when using cashless payment solutions					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	1.2	1.2	1.2
	Disagree	9	11.0	11.0	12.2
	Undecided	14	17.1	17.1	29.3
	Agree	40	48.8	48.8	78.0
	Strongly Agree	18	22.0	22.0	100.0
	Total	82	100.0	100.0	

The next question asked respondents whether their customers feel they are modernized when using cashless payment solutions or not. The mean value of 3.79 says it all that the respondents believe their customers feel they are modernized when using cashless payment solutions. The high level of consensus is spotted by the standard deviation being 0.952. No matter what the benefits and the drawbacks they may encounter, people may choose to be felt like modern and use a cashless payment solution.

Table: Cul 11

Small gap between activation and recruitment on cashless payment solutions					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	8	9.8	9.8	9.8
	Disagree	22	26.8	26.8	36.6
	Undecided	6	7.3	7.3	43.9
	Agree	39	47.6	47.6	91.5
	Strongly Agree	7	8.5	8.5	100.0
	Total	82	100.0	100.0	

By being persuaded by the staff or by several commercials, there may be people who became recruited for cashless payment solutions. These people may not use the cashless payment solution after being recruited. To figure this trend, the researcher asked respondents whether there is high gap between recruitment and activation of cashless payment solutions. Respondents believe there is no such high gap. However, there was no general consensus between respondents since the standard deviation is greater than 1.

Table: Cul 12

Becoming users of cashless payment solutions by willingness					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	7	8.5	8.5	8.5
	Disagree	22	26.8	26.8	35.4
	Undecided	11	13.4	13.4	48.8
	Agree	26	31.7	31.7	80.5
	Strongly Agree	16	19.5	19.5	100.0
	Total	82	100.0	100.0	

The last question asked respondents whether customers are Becoming users of cashless payment solutions by willingness or by the push of a scenario. The respondents agreed respondents are becoming users by their inquiry. However the standard deviation tells the data points were not close to the mean.

4.4.5 Technological and Infrastructural Factors in relation with the creation of cashless society

As we can easily guess the back bone of creating a cashless society is the technology and infrastructure part. The other factors we have seen can more or less be things that can be fulfilled after the technology factor is considered. Below, I tried to show the agreement or disagreement of the respondents of 12 questions that were prepared in relation with technology and infrastructure factors thought to be affecting the creation of cashless society. This is believed to show us whether Technological or infrastructure issues relating to cashless society have been satisfied in Ethiopia or not. The questions were planned in a way that can show the strength of infrastructural and technological factors within the observed bank in its self and also outside of it. These questions were designed in a way by which the respondents were asked their level of agreement on specific cultural issues. These closed ended questions were rated in a five point likert scale ranging from “1” “Strongly Disagree” to “5” “Strongly agree”. In accordance with this, the researcher tried to calculate the mean, median, standard deviation and inter quartile range of data points. The summary of results of these technological and infrastructural related questions is as shown below

Table 14: Statistical Summary of Technology and infrastructure factors affecting the creation of cashless society

	N		Mean	Median	Std. Deviation	IQR
	Valid	Missing				
Infrastructure built for long period with aim of creating cashless society	82	0	2.67	2	1.306	2
Cashless payment technology upgraded every time	82	0	3.52	4	0.984	1
Infrastructure like power supply and Broadband helping for cashless payment mechanisms Satisfactory	82	0	2.28	2	1.168	2
Other solutions for cashless payment mechanisms to work when power supply and internet interrupted	82	0	2.65	2	1.221	2
Rapid development in technology is pushing cash further away	82	0	3.66	4	1.009	1
Electronic payment solution for high value low volume transactions	82	0	3.62	4	1.038	1
Research and Development center with resource and manpower working towards innovating new things	82	0	3.55	4	1.056	1
Exploiting technological solutions to promote socio economic development	82	0	3.49	4	1.069	1
Network difficulties are faced frequently	82	0	4.26	4	0.953	1
Financial or incentive reward for innovations	82	0	3.35	3	1.058	1
Electronic payment solutions perceived user friendly& not complex	82	0	3.57	4	1.078	1
Adequate capacity in network if as many people as there are would need to use electronic payment solutions	82	0	2.46	2	1.307	3

Table: Tech Infra 1

Infrastructure built for long period with aim of creating cashless society					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	18	22.0	22.0	22.0
	Disagree	25	30.5	30.5	52.4
	Undecided	13	15.9	15.9	68.3
	Agree	18	22.0	22.0	90.2
	Strongly Agree	8	9.8	9.8	100.0
	Total	82	100.0	100.0	

The first question tried to figure out if Infrastructure has been built for long period with aim of creating cashless society in Ethiopia. Most of the respondents didn't think infrastructure has been built with the aim of creating a cashless society since the mean was 2.67. But there were various answers and the standard deviation greater than 1 implies there was no full consensus between respondents. The infrastructures that are mainly used for cashless payment solution are internet and mobile connection. Interrelating this issue with what we have got in trajectory of mobile money, the penetration in mobile and internet penetration was less from the African average and east African countries can be due to this fact.

Table: Tech Infra 2

Cashless payment technology upgraded every time					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	3.7	3.7	3.7
	Disagree	13	15.9	15.9	19.5
	Undecided	11	13.4	13.4	32.9
	Agree	48	58.5	58.5	91.5
	Strongly Agree	7	8.5	8.5	100.0
	Total	82	100.0	100.0	

For the question that asked respondents on whether the bank has been upgrading cashless payment solution services, most of them said it is doing so. Since the standard deviation was less than 1 we can make sure most of the respondents have consensus with the answer. This issue takes us to the point that we raised in both regulatory and security of upgrade. For the reason of complying with rules or for competing in the market, no matter the reason, cashless payment solutions are upgraded every time.

Table: Tech Infra 3

Infrastructure like power supply and Broadband helping for cashless payment mechanisms Satisfactory				
	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	23	28.0	28.0	28.0
Disagree	34	41.5	41.5	69.5
Undecided	7	8.5	8.5	78.0
Agree	15	18.3	18.3	96.3
Strongly Agree	3	3.7	3.7	100.0
Total	82	100.0	100.0	

Table: Tech Infra 4

Other solutions for cashless payment mechanisms to work when power supply and internet interrupted					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	15	18.3	18.3	18.3
	Disagree	30	36.6	36.6	54.9
	Undecided	11	13.4	13.4	68.3
	Agree	21	25.6	25.6	93.9
	Strongly Agree	5	6.1	6.1	100.0
	Total	82	100.0	100.0	

For the third question that asked on whether Infrastructure like power supply and Broadband that helps for cashless payment mechanisms is Satisfactory or not, respondents disagreed. This is inter related with what we have been saying previously about building infrastructure. For the fourth question that asked on whether there are other solutions for cashless payment mechanisms to work when power supply and internet are interrupted, respondents agreed there are no such mechanisms. However the standard deviation for both questions was greater than 1 implying data points are not close to the mean.

Table: Tech Infra 5

Rapid development in technology is pushing cash further away					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	4	4.9	4.9	4.9
	Disagree	8	9.8	9.8	14.6
	Undecided	12	14.6	14.6	29.3
	Agree	46	56.1	56.1	85.4
	Strongly Agree	12	14.6	14.6	100.0
	Total	82	100.0	100.0	

Table: Tech Infra 6

Electronic payment solution for high value low volume transactions					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	2.4	2.4	2.4
	Disagree	13	15.9	15.9	18.3
	Undecided	14	17.1	17.1	35.4
	Agree	38	46.3	46.3	81.7
	Strongly Agree	15	18.3	18.3	100.0
	Total	82	100.0	100.0	

Table: Tech Infra 7

Research and Development center with resource and manpower working towards innovating new things					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	3.7	3.7	3.7
	Disagree	10	12.2	12.2	15.9
	Undecided	24	29.3	29.3	45.1
	Agree	29	35.4	35.4	80.5
	Strongly Agree	16	19.5	19.5	100.0
	Total	82	100.0	100.0	

For the technology and infrastructure issues that rapid technology is pushing cash farther away, there are electronic payment solutions for high value low volume transactions and CBE having research and development center that works towards innovating new things, the mean values were 3.66, 3.62, and 3.55 respectively. The standard deviations were also greater than 1 for three of these issues implying respondents have various opinion on the issue. This in other words means the respondents believe cash is being pushed farther due to technological advancements in the bank and there are other electronic payment solutions for high value low volume transactions. Ultimately the respondents said the bank has research and development center that has adequate staff working towards innovating new things.

Table: Tech Infra 8

Exploiting technological solutions to promote socio economic development					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	5	6.1	6.1	6.1
	Disagree	11	13.4	13.4	19.5
	Undecided	15	18.3	18.3	37.8
	Agree	41	50.0	50.0	87.8
	Strongly Agree	10	12.2	12.2	100.0
	Total	82	100.0	100.0	

Most of the respondents believe our country is Exploiting technological solutions to promote socio economic development. For the question that was asked in order to know this, the mean was 3.49 indicating the respondents' agreement to the issue. However the standard deviation was greater than 1 indicating the opinion of respondents was various. What this question was keen to know was the overall technological advancement in our country.

Table: Tech Infra 9

Network difficulties are faced frequently				
	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	3	3.7	3.7	3.7
Disagree	2	2.4	2.4	6.1
Undecided	5	6.1	6.1	12.2
Agree	33	40.2	40.2	52.4
Strongly Agree	39	47.6	47.6	100.0
Total	82	100.0	100.0	

Table: Tech Infra 11

Electronic payment solutions perceived user friendly& not complex					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	5	6.1	6.1	6.1
	Disagree	12	14.6	14.6	20.7
	Undecided	6	7.3	7.3	28.0
	Agree	49	59.8	59.8	87.8
	Strongly Agree	10	12.2	12.2	100.0
	Total	82	100.0	100.0	

The above table shows the degree of agreement about frequent network difficulties faced by customers in using payment solutions and about the bank having user friendly and not complex electronic payment solutions. To both these questions respondents agreed frequent network difficulties are faced and the payment solutions used by the bank are not complex. Complexity

of a technology makes people to not use it even if one is interested in using it. However, cashless payment solutions introduced by the bank are not complex as it is inferred from the data. This adds to the adoption of cashless payment solutions since using them is not complicated.

Table: Tech Infra 10

Financial or incentive reward for innovations				
	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	3	3.7	3.7	3.7
Disagree	15	18.3	18.3	22.0
Undecided	26	31.7	31.7	53.7
Agree	26	31.7	31.7	85.4
Strongly Agree	12	14.6	14.6	100.0
Total	82	100.0	100.0	

This question tried to see if there are financial or other types of incentives by which the bank rewards innovations towards cashless payments. The respondents agreed the bank has rewarding mechanisms. This also leads us to what we have been saying again and again previously. The dynamics of the digital payment is highly volatile and needs upgrade and improvement from time to time. The bank has rewarding strategy for innovations towards cashless payment solutions. This makes coping up with the volatility of the dynamics easy.

Table: Tech Infra 12

Adequate capacity in network				
	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	21	25.6	25.6	25.6
Disagree	32	39.0	39.0	64.6
Undecided	7	8.5	8.5	73.2
Agree	14	17.1	17.1	90.2
Strongly Agree	8	9.8	9.8	100.0
Total	82	100.0	100.0	

The final question Asked respondents whether there is adequate network capacity that can take as many people as there are if they choose to become users of cashless payment solutions. Even if the data points are not close to the mean, the mean value indicates there is no adequate network capacity. This issue was raised to know what the current status of the network capacity in making people users of cashless payment solutions looks like. The results indicate the capacity is not enough and needs addition.

CHAPTER 5

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summary of Major Findings

5.1.1 Summary of Trajectory and current share of cashless payment solutions

Mobile money has become a platform which has shown impressive growth throughout the years. This is why it has become available in two thirds of low and middle income countries. Not only this, it has also shown growth in other parts of the world. For example there were only 5 countries where mobile money was available in 2006. However in 2016, this number has grown to 92 countries. As it was indicated previously, most users of mobile money platform are found in sub Saharan African countries. Even if the rate of growth is high in sub-Saharan African countries, West Africa region's growth in mobile money has been slow. In relatively wealthy countries of North Africa the penetration rate of mobile money is even lower.

As our country is one part of the sub-Saharan African countries, it must have shown an impressive growth in the platform. However, while its mobile money penetration is compared with countries around the world, the country that has fewer users than our country per thousand adults was only Ecuador. Well, this is true for countries where the data was available for.

As we can presume, the growth of digital payments that we are witnessing rides on the back of mobile and internet penetration. In relation to this, world's average penetration of mobile and internet is 65 and 46 percent respectively. When African average is thought, this number stood to be 80 and 32% respectively. In Ethiopia, this number is 54 and 15 percent respectively, making it to be below the African and World Average. When the east African nations' Kenyan and Ugandan case is considered, their penetration rate is 80/ 89.4 percent and 65/45 percent respectively. This shows the penetration rate in both indicators is low in our country.

This being said, the other thing seen was a study by Brookings institution that showed existence of opportunities for enhanced adoption of mobile money and other digital financial services that leverage mobile infrastructure, From 26 countries observed around the world Ethiopia stood at last in this indicator.

Not only these, the things that we see below also showed Ethiopia lags behind in the mobile money platform when compared with eastern Africa nations.

Let us first start with the year mobile money was commenced in these countries. For instance, in eastern African nations of Kenya, Uganda and Tanzania, mobile money service started in 2007, 2009 and 2008 respectively. The service started in 2013 in Ethiopia.

Kenya by the year 2015 has been able to attract above 17 million users and what Ethiopia has been able to attract was 150,000 users. When we try to see this in other way, while Kenya has attracted 2.7 million users and Uganda attracted 280,000 users within 14 months of their mobile money commencement, Ethiopia's first mobile money service M birr has been able to attract 150,000 users with the same time interval. The other interesting thing was, while Ethiopia was commencing its first mobile money service provider M birr in 2013, Tanzania had 5 million subscribers. The final thing in relation with mobile money is an issue of new developments in mobile money. From new developments in mobile money platform, mobile credit service where loan facilities are entertained through mobile phones is notable. Even if 11 countries in Africa have already started the service, our country couldn't be one of them.

When we come to ATM and other cashless payment solutions, According to the World Bank's latest published data, that showed many countries' performance in ATM deployment, Korea Republic stood at first in deploying many ATMs per 100,000 adults. The last country in the list was Afghanistan scoring 0.96 ATMs per 100,000 adults. Ethiopia at the list was mentioned to have 2 ATMs per 100,000 adults. This statistically speaking was 0 ATMs per 100,000. From Africa the list is fore fronted by South Africa deploying 69 ATMs per 100,000 people. East African countries Sudan, Uganda, Rwanda, Tanzania, Djibouti and Kenya scored 4.49, 4.55, 5.7, 6.04, 8.87 and 8.87 ATMs respectively. When we see the step of close to cashless society countries, France scored 106 Canada scored 220, Portugal scored 175 and Australia scored 165 ATMs per 100,000 adults. The penetration rate in deployment of ATMs also shows a lot needs to be done.

In relation with POS terminals, according to the data from the World Bank, for which countries' data was available, Costa Rica and Australia deployed large number of POS terminals per 100,000 adults. The deployed number for Costa Rica and Australia reached more than 4700 POS terminals.

The country that stood at last was Iraq with 3 POS deployed per 100,000 adults. While seeing our country's case, 6 POS terminals were deployed per 100,000 adults. From Africa South Africa is the leader with this regard by 965 deployments.

The other thing that was observed was the level of retail payment by which a person pays to a business electronically. Electronical retail payments for sale from person to business are mostly entertained in Japan with 63% of the sales made electronically. The list from Africa is led by Botswana and South Africa by score point of 33% and 29% respectively. Ethiopia with this regard scored 15%. When we see business to business payments or electronic payment from supplier to supplier, the countries that are highly entertaining these are Estonia and Japan with 86 and 82 percent. Botswana leads the way from Africa with 53% and Ethiopia scored 32% of B2B payment made electronically. The least electronic payment from supplier to supplier is made in Pakistan with 13%. Electronically made wage payments from business to person are not mostly entertained in Pakistan as they are not for B2B. From Africa the country that mostly uses this platform and B2P electronic payments are highly entertained is South Africa. And the world's figure is led by Lithuania. Ethiopia has a score of 18% with this regard. When the three above indicators B2P, P2B and B2B are considered between East African countries, Ethiopia is doing well.

As a final look, what was above seen was number of adults transacting electronically. As it was indicated, Ethiopia scored low from Tanzania and Kenya on the area.

As we have been seeing in most indicators, Ethiopia lags behind not only from close to cashless society countries but also from African countries. Ethiopian customers have missed to enjoy the technological advancement in banking sector which has been entertained elsewhere in Africa and the rest of the world. ¹⁸

5.1.2 Summary of Readiness for Cashless society

The first thing seen here was about people having a bank account at a financial institution. As the World Bank's data showed, Ethiopia leads only four countries from the countries where data was available for. With regard to number of branches, even if there are other African countries doing well, the Ethiopian case is not that bad while compared with African countries. However, while compared with the world average in 2014 and with other world countries, it shows there is a lot to do in this regard.

When we come to security issues in relation with cashless payment solutions, as it was indicated from the above list of tables, all of the results showed respondents sided with the agreement choice. As respondents pointed out, customers are made to have knowledge about advantages and disadvantages of cashless payment solutions before they become users of them. In addition to this, customers are also well-informed about their rights, obligations and about security risk issues they should take care on. As it is also inferred from the above responses, the bank has adequate personnel that have skills in relation with cyber security and also has bondage with security and intelligence bodies of our country and the world. In addition to these, the bank has also consulting firms that have best expertise in cyber security. Ultimately the umbrella that holds the entire security skeleton or the framework is updated frequently making it cope up with the changing dynamics. When we come to attitude of Customers and staff of the bank towards security, they are taught and alerted about security risk issues they should take care on as it is inferred from the responses..

When we come to regulatory issues, as respondents mentioned, regulatory frameworks in the country towards cashless payment solutions are those that facilitate the provision of the service. In addition to this, it was also mentioned these rules are not changed frequently and enable service to be provided in stable way. As it was additionally inferred from respondent's reaction, the rules and regulations towards cashless payment solutions are not rigid and permit flexibility in complying. This makes them to be suitable for innovation, flexible enough and also make them protect all actors participating. In relation to this, these rules and regulation force banks to make improvements and upgrades from time to time. They also have performance standards that banks should follow. Even if there are vagueness in the rules and regulations of the bank towards cashless payment, the staffs of the bank work in accordance with them.

Referring the respondents' reaction above about cultural and behavioral factors, their customers at branch have knowledge about cashless society. Customers are ok with the idea of abolishing cash as a legal tender and replacing it with cashless payment solutions. Respondents also mentioned Customers are satisfied with the availability of ATMs and they are not afraid about their privacy being breached when using internet and mobile banking. It was also expressed by the respondents that recruitment of cashless payment solutions is gained by the willingness and request of customers. This scenario by return has made the gap between activation and recruitment to be minimal. Finally, Even if customers of the bank consider paying cashless as a modernization concept, they prefer paying by cash to be suitable.

When we come to the final sub part, In our country, there was no long term plan working on infrastructure building in relation with creating cashless society and due to this reason the basic things for Digital payment means like power supply and broad band are not satisfactory according to the respondents. Relating with this, as most of them agreed there is no replacing option for power and network interruption.

In relation with modernizing technologies, cashless payment solutions of the bank are upgraded every time. Not only this, there is a way for high value low volume transactions. In addition to this, the bank has research and development center and staff working towards innovating new things and the bank also financially or through other means rewards innovations. Most of the respondents agreed network difficulties are frequently faced and they don't believe there is network capacity that adds many users. Most of the respondents agreed our country is exploiting technological advancements in promoting socio economic development and rapid development in technology is pushing cash farther away.

5.2.Conclusion

As we have seen throughout the study, in most usage indicators of cashless payment solutions Ethiopia lags behind while compared with African and close to cashless society countries. In all indicators like mobile money usage, ATM penetration, POS deployment, P2B, B2B, B2P and overall electronic transactions, the numbers were not good for Ethiopia. From the aforementioned indicators the gauges that our country is exploiting more are P2B, B2B and B2P. Other than this the pace that we are heading towards the usage of cashless payment solutions is not good. The same is true with regard to access to financial services even if branch number is somewhat good compared with some other eastern African countries. As we have been seeing above, most of the figures are not satisfactory enough to show we are really heading to abolishing cash and replacing it with cashless payment solutions.

The most challenge factor that was observed from the readiness for cashless society side was the Infrastructure part. As Elfagid 2015 expressed it “it is like putting the cart before the horse” As a country there were no long term plans working in infrastructural building in relation with creating a cashless society. Since this is not fulfilled, no matter what financial institutions do to add to the cart of cashless payment solutions, the effect on adding the number of users would be minimal. Network difficulties and power interruptions to this case are frequently faced by customers. No matter how a bank works on changing the attitude of customers and no matter it adjusts its security frameworks, if the backbone of the service, the infrastructure part is lagging behind, this makes things not to work out. In relation with this, things become even worse since the bank doesn’t have plan “B” for the interruption in network and power supply. This can make people whose attitude has moved out to cashless payment solutions to return to teller services. Not only this, but network capabilities are not enough to accommodate those who have become the users let alone adding others. However the bank is doing well in the technological part since it is innovating new things and also is giving credit for innovators.

As we have also been seeing it in the trajectory part, the pace our country is going is not good while it is compared with African countries and countries thought to be close to cashless society. This issue shows a lot needs to be done before cashless society is thought. Even if there were very few negative issues in regulatory and Cultural factors, the infrastructural part is and will in

the future be the main reason hindering the creation of cashless society. This is why there are things that are raised by stakeholders that the Ethiopian Payment system is lagging behind due to Low level of internet penetration and poorly developed telecommunication infrastructure. In addition to this, Lack of infrastructure for telecommunications, Internet and online payments impede smooth development and improvements in e-payment in Ethiopia. As Maria Lamgan (2016) mentions there is still a long way to go before going totally cashless becomes a reality. The transition from cash to cashless society could be costly in itself since countries would need the right infrastructure to support a cashless economy. Thus, in addition to habit of using cash for a long time, not functioning technology and poor infrastructure would push the creation of cashless society farther.

5.3.Recommendation

As it is known, new technology raises new security concerns. Banks have been the subject of cyber security concerns for years. As they and other connected businesses have become more reliant on networked technology, criminals have targeted them more. Though hacking is not that much heard in our country's financial service firms, it is incredibly real risk factor for the future. Hence, Regulators should monitor banks' vulnerability so closely. Not only this, regulatory frameworks as a country and as a bank shall also be monitored closely since the dynamics of cashless payment solutions has been changing from time to time.

As I have said it above, customer's attitude towards cashless payment solutions is good and it can be inferred from this that it is not a hindering factor for the creation of cashless society. However the researcher thinks, this can be true for only some cities of Ethiopia. This researcher's opinion emanated from a data on the access to financial services. Andualem Ufo Baza and K.Sambasiva 2017 in their work Financial inclusion in Ethiopia mentioned the fact that there were 3093 bank branches in Ethiopia in December 2015 and from this 35.35% or 1094 bank branches are found in Addis Ababa. This shows bank branches are concentrated in some cities and the inclusivity of all people is not satisfied with this regard. If we are about to do the research concentrating in rural areas, the result would have been another since people in cities are only thought and highly know the use of technology. As our society is highly concentrated in the countryside, all stake holders should work in these areas if creating a cashless society is to be achieved. For example, using the growth in penetration of mobile phones in our country mobile money accounts can be highly used by people in rural areas. Not going too far, what our neighbor to the south Kenya has done is this. Relating with this, the state owned giant, commercial bank of Ethiopia has started agent banking services through phones called CBE birr. The move came four years after the bank started feasibility study to provide the service. The move by CBE, whose market share is around 40% to start this service, is said by people to be wise. CBE has the reputation and the resources to penetrate the market. It can leverage its reputation to get considerable market share in mobile money activities and make our country be like other countries that are using mobile money to make most of their population financially included.

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APPENDIX

Addis Ababa University

College of Business and Economics

Department of Accounting and Finance

Dear respondent I am conducting a research for the partial fulfillment of MSC degree in Accounting and Finance on the title **“Creating a cashless society in Ethiopia; an illusion or a dream coming true in the near future: the case in commercial bank of Ethiopia Addis Ababa branches.”**

I do firmly believe your participation is highly helpful to reach at a genuine research finding and I am thankful that you are filling the questionnaire with the high work load by your side. This being said, I do want to assure you the information that you are going to give will only be used for this research work. Finally, I want to point out there is no need to mention your name on the questionnaire.

Please answer the questions by marking “x”sign on the box provided.

1. Age: below 20 ☐ 21-30 ☐ 31-40 ☐ 41 and above ☐
2. Sex : Female ☐ Male ☐
3. Educational background : First Degree ☐ Masters or above ☐
4. Work experience in CBE : Below one year ☐ one – five years ☐ above five years ☐

N o.	Security Factors	Strongly agree	Agree	undecided	Disagree	Strongly Disagree
1	When we make our customers users of our cashless payment solutions like mobile and internet banking, we make sure that they know what the advantages and disadvantages associated with the payment solutions are.					
2	When customers begin to use mobile banking, internet banking and ATM services in a branch, we make sure that they have adequate knowledge on the security risk issues that they should take care on.					
3	When we make our customers users of our cashless payment solutions like mobile and internet banking, we make sure that they know what their obligations and rights are					
4	The bank (CBE) has personnel in an adequate manner that have skills in relation with cyber security.					
5	The bank has risk assessment tools that are effective and that work well in tackling threats towards cyber security.					
6	The bank has information gathering tools that try to get information on new threats or developments towards cyber attacks.					
7	The bank has a strategy for helping customers if something went wrong while they were using payment solutions like internet and					

	mobile banking					
8	The bank works with and has strong bondage with security and intelligence bodies of our country.					
9	Security frameworks of the bank are updated frequently.					
10	The bank works with and has strong relationship with worldwide security and intelligence bodies.					
11	The bank has consulting firms that have the best expertise in cyber security.					
12	Alerting and teaching customers and staff about new developments and threats towards cyber security is a frequently done task by the bank.					

N o.	Regulatory Factors	Strongly agree	agree	undecided	Disagree	Strongly Disagree
1	More enabling regulatory frameworks have been established by the government in relation with ATM, Mobile banking and internet banking services.					
2	The regulations towards ATM, Mobile banking and internet banking allow banks to provide services in a sustainable way.					
3	There are some ambiguities or loopholes that are seen in the e payment related rules of the bank.					
4	As an overall look, when staffs of the bank make customers users of the bank's payment solutions, I believe they work in accordance with rules established for e payment purposes.					
5	The rules and regulations towards cashless payment solutions {mobile and internet banking} are intended to force banks to upgrade and make further improvements from time to time.					
6	The rules and regulations towards cashless payment solutions like mobile and internet banking consist performance standards that banks should follow.					
7	The rules and regulations towards cashless payment solutions like mobile and internet banking encourage innovation.					
8	In the rules and regulations towards cashless payment solutions, flexibility to choose methods of compliance is likely.					
9	The rules and regulations towards cashless payment solutions try to protect all actors that participate in these payment solutions.					
10	When customers fill forms for using mobile, internet and ATM services, the staffs of the bank make them understand all terms and conditions written on the forms.					

N o.	Cultural and behavioral Factors (customers and merchants)	Strongly agree	agree	undecided	Disagree	Strongly Disagree
1	Most of my branch's customers have heard about Cashless society?					
2	Most of the branch's customers feel a Cashless Economy where legal tender is abolished (stopped) should be introduced in Ethiopia.					
3	The current availability of CBE's ATMs is thought by customers as satisfactory.					
4	Uptake of mobile banking, internet banking and ATM solutions by customers is rapid. (recruitment of these payment solutions is huge)					
5	Cashless payment mechanisms like mobile and internet banking are believed by customers to violate privacy since all their transactions could become traceable.					
6	Merchants believe the discount that the bank gives when their customers buy through cashless payment solutions has made their sales boost.					
7	The psychology to physically hold and touch cash is high among my branch's customers and merchants.					
8	Merchants believe the payment solution introduced to them which is POS is easily operable and does not need being an expert.					
9	There is a high level of insistence by customers to pay by cash even if they are recruited to electronic payment solutions.					
10	Customers feel they are modernized when using cashless payment mechanisms than when using cash.					
11	The gap between activation and recruitment on the payment solutions mobile banking, internet banking and ATM services in CBE is small.					
12	Most of the branch's customers now a day are becoming the users of cashless payment mechanisms by their inquiry or willingness.					

No .	Technology and Infrastructure Factors	Strongly agree	Agree	Undecided	Disagree	Strongly Disagree
1	I believe infrastructure in Ethiopia has been built for long period of time with the aim of creating cashless society.					
2	Cashless payment solution technology has been upgraded every time in Commercial bank of Ethiopia.					
3	The infrastructure in Ethiopia that helps for electronic payment mechanisms like power supply and broad band is satisfactory.					
4	There are other solutions by the bank for making cashless payment solutions work when there are interruptions in internet and power supply.					
5	I believe rapid development in technology is pushing cash farther away.					
6	Currently there are electronic payment solutions for high value low volume transactions.					
7	The bank has research and development center on electronic payment solutions that has adequate resources and manpower working towards innovating new things.					
8	I believe my country is exploiting technological solutions to promote socio economic development.					
9	Network difficulties are frequently faced by customers when using ATM, Mobile banking and Internet banking payment solutions.					
10	CBE financially or through other incentives rewards innovations in electronic payment solutions.					
11	The payment solutions used by the bank (internet banking and mobile banking) are perceived by customers to have been user friendly and not complex.					
12	There is adequate capacity in our country's' networks if as many people as possible needs to become users of payment solutions.					