Analysis of Somaliland Mobile Money Service on Effective Inflation Control: Case of Hargeisa Foreign Exchange Market in Somaliland

Hussein Abdillahi Roble Guleid[1]
MBA Student, Finance and Accounting,
Mount Kenya University, Kenya

Dr. Mary maina[2]
Lecturer, School of Business and Economics,
Mount Kenya University, Kenya

Ondabu Ibrahim Tirimba[3]
Lecturer, School of Business and Economics,
Mount Kenya University, Kenya

Abstract

This research was conducted to investigate the relationship between mobile money and effective inflation control. The objectives of this research were to determine the relationship between mobile money and inflation control in Somaliland, to find out whether demand and supply of mobile money helps inflation control in Somaliland and to determine the relationship between exchange rate control and inflation control in Somaliland. The study used the quantity theory of money and the modern monetary theory in explaining the behavior of inflation control. The empirical review was guided by the objectives of the study. The target population of the study was comprise of 220 respondent that were sub divided into 120 exchange traders that operate in Hargeisa foreign exchange market and 100 Zaad staffs including Zaad managers. A sample of 119 respondents was selected from the population using stratified random sampling technique. Data was be analyzed by aid of Statistical Package for Social Science (SPSS) version 20 and was presented by tables. Findings on mobile money transfer (Zaad) and effective inflation control reveal that mobile money service (Zaad) can be a tool for inflation control that helps central banks to control inflation. Recommendation on the mobile money transfer and effective inflation control, governments should use mobile money transfer as inflation control with carefully designed policies and procedures in order to keep customer satisfaction.

Key Words: Mobile money, supply and demand of money, exchange rate control, inflation control

1. INTRODUCTION

1.1 Background

For many years, money has been the legal tender through which goods and services are exchanged. The goods and services that it can be exchanged for determine the value of money; for example the number of laptops determines the value of $100 paper that it can be exchange for or the number of call charges its value can make. Money can exist in two forms, which is either hard cash or electronic cash. The last form has emerged in recent years with the advancement of technology. When a new technology emerges a new form of electronic cash might emerge for instance when the computers were developed ATM's have emerged and when mobile telephony was developed and sunk its foot as reliable means of communication. Mobile money transfer has emerged as the fastest means and easiest means to exchange money with goods and services. A new terminology has also arisen referred to as mobile banking which involves financial transactions that happen with the usage of mobile phones (Klein and Mayer, 2011).

In Somaliland mobile money transfer begun in 2009 with Telesom company, and eventually it become popular among populace. It is used for merchandising, salaries and paying other expenses and sometimes as saving account. In contrast to other similar systems such as M-pesa in Kenya the Zaad service in Somaliland uses USD for their transactions and all other Zaad services are not charged. In 2014 Somtel telecommunication company which is the second largest telecommunication company and a member of Dahabshiil group introduced E-Dahab which works as Zaad. Both users of Zaad and E-Dahab can receive money from remittances and also they can make deposits in their accounts with their respective banks namely Dar salaam Bank and Dahabshiil Bank. The perceived ease has great influence on the usage of mobile money in both Somalia and Somaliland (Sayid, 2012)

According to the MMU (2013) report, about 40% of Telesom customers were active users of Zaad. Those active users were making thirty transactions per month which is above the average of any other mobile money

transaction which stood at eight point five (8.5) per month. This made Telesom one of the fourteen leading companies in Africa that provides mobile banking services. On the other hand Telesom made progress in cash replacement after its cash in and cash out difference fell from 1.3 to 0.5 respectively in March 2010 and 1.3 to 0.3 respectively (Penica and McGraths, 2013). The difference between cash in and cash out shows us that many customers use Zaad as a bank because they save their money instead just sending it through the mobile. According to Eur and Resnik (2004), the foreign exchange market is the market that determines the conversion power of one currency to another currency. Hargeisa foreign exchange market is composed of a number of exchange traders that perform currency conversions based on the demand and supply of their market. The currencies that are exchanged in this market are the U.S Dollar to Somaliland shilling and Somaliland shilling to U.S Dollar other currencies that are converted are the Ethiopian Birr and Somaliland shilling. This market is not officially regulated by the Central Bank of Somaliland and also these traders operate without any form licensing but the Central Bank of Somaliland has recently issued a license requirement to all foreign exchange traders. The Hargeisa foreign exchange market is located near Ali-Matan Mosque.

Somaliland financial report has reported an increase in the rate of inflation, which increased from PI of 93 in 2008 to PI of 124 in 2012 which is harmful to the economy at large (Somaliland Eco-Conference report, 2014). Simpasa and Gurar (2012) reported that the M-Pesa (Kenya mobile money transfer) has been an influential factor towards the Kenyan inflation increase. As competition intensifies rapid usage of mobile money transfer has become a new trend in Somaliland. It is speculated that the mobile money usage has caused the increase of inflation. Aron and Muelbauer (2015) researched on the relation between inflation and mobile money in Uganda and concluded that mobile money does not cause inflation but it helps its reduction. This research was based on Uganda's Telecommunication Companies that provide mobile money transfer and use local currency in their transactions but the effect of mobile money transfer on inflation when the said transactions are in foreign currencies such as the U.S Dollars has yet to be identified.

Anderson, (2013) researched how electronic monetary systems offer macroeconomic control. In his conclusion, he stated that electronic money can be applied with modern monetary theory through fees that banks charge the electronic transfer between bank accounts. His research is based on electronic money that circulates within bank accounts and not mobile money that circulates between individuals. On the other hand, he does not investigate how electronic money like mobile money can be a tool for controlling inflation. Although numerous studies are done in the field of mobile money and its impact on economic situations, they have failed to investigate how the mobile money will behave if it is used as an inflation control tool. The area still remains grey more so in Somaliland, a country which is searching for alternatives ways to solve its inflation pandemic. This is what prompts the researcher to conduct this research.

The general objective of this study is to analyze mobile money and effective inflation control. The specific objectives were: to determine the relationship between the mobile money and inflation control in Somaliland, to find out whether demand and supply of mobile money helps in inflation control in Somaliland and to determine the relationship between exchange rate control and inflation control in Somaliland.

The study informs the stakeholders of mobile money namely telecommunication companies and the central bank to effectively perform necessary regulatory actions as a consequence of this study. On the other hand, the study will be a good reference point for future researchers that shall be interested in studying the effects of mobile money transfer systems dominated by foreign currency and their influence on inflation globally and those who shall be interested in investigating Somaliland's economy as whole. Finally the study will inform Somaliland investors on the financial position of the country and possible investment areas.

The study was conducted between September and October 2015. The study will be confined to the geographical area of Somaliland, a country located in the horn of Africa. The study scope was confined to the focus of the relationship between mobile money transfer and effective control of inflation.

This research was limited to the Hargeisa exchange market. This exchange market is unique to other Somaliland regional exchange markets which might have different opinion about the mobile money transfer and inflation control. Another expected limitation is a language barrier, because most exchange dealers do not understand the English language. The researcher has compelled to interpret the information on the questionnaire to the respondents in a bid to bridge the language barrier problem. Conducting primary research from Zaad staff may be biased, because the staff my tend to curtain dress the image of their company so that it cannot be seen as contributing to inflation in Somaliland. The wrong choice of instruments might be another limitation, something that the researcher ensured by conducting a pilot test, a reliability test and a test of validity.

2. LITERATURE REVIEW
2.1 THEORETICAL REVIEW
The theoretical review of this study is coming from two theories, which are Quantity Theory and Modern Monetary theory. These two theories are selected because of their contribution in inflation control.

2.1.1 Quantity Theory of money

Quantity theory is one of the oldest economic theories that were developed, in the middle centuries. It is hypothesis about major causes of changes of purchasing power. According to the theory the changes of purchasing power is determined by the quantity of money that is in circulation. In short the Quantity theory states that, the abundance of money is what determines the price of goods (Humphrey, 1974). For example if the abundant of money in circulation increases the purchasing power decreases , for instance if one hundred dollar can be paid a fifty kilogram of Rice before the quantity in circulation had not increased then the same a fifty kilograms of Rice is paid one hundred and ten dollar after the quantity dollar increased. This shows that the purchasing power of dollar has decreased as it's quantity in circulation had increased.

Quantity theory states that quantity of money and price of goods and services have a direct relationship. This relationship can be expressed Fisher's (1911) equation, which is as follows.

MV=PT

Where M=Money supply

     V=Velocity of money circulation

     P=Average price level

     T=Volume of transactions of goods and services.

In this equation, Mr. Fisher has made assumptions, which are as follows: the velocity of money circulation and volume of transactions are constant also the quantity of money is the determinant of the price of goods and services. According to the quantity theory, inflation can be controlled by increasing quantity of money substantially and deflation can be controlled by decreasing the quantity of money appreciably (Friedman, 1987). This means in order to control the inflation the supply of money must be equivalent to the supply of goods and service.

2.1.2 Modern monetary Theory

The modern monetary theory is a description of modern monetary systems within a nation operating fiat currency that involves an autonomous monetary system, monopoly supply of currency and floating exchange rates (Roche, 2011). According to MMT, the government should inject its currency into the commercial banks through its expenses and advances then it should drain back the currency through taxes and advance repayments.

This means that the government first prints its currency, in order to force its nation to use the printed currency it uses for the payment of its expenses such as public employee salaries and its other expenses. Its central bank also gives advances which are dominated by the country's currency to commercial banks. These two factors pump the currency in circulation and then the government in order to regain the currency it then uses taxes and compels commercial banks to repay the advance that the central bank had earlier given to them. The currency then restarts its cycle that starts from government expenses and advances then ends to the government tax and repayment of advances. The modern monetary theory states that money has value since it is acceptable in taxes. In this theory taxes are used to drain money in order to control demand and see that the government and the central bank function as one unit. The pressure of taxes controls the inflation. The government injects money to the market by increasing its expenses and advances that it gives to the commercial banks whenever there is a demand and removes money from the market by increasing taxes and allowing advance repayments whenever the supply of money increases (Tymoigne and Wray, 2013)

2.2 EMPIRICAL REVIEW

2.3.1 Mobile money transfer and inflation

Ali and Daha (2013) studied the influence of mobile money transfers among students in Somalia. The perception that it was easy to access and convenient exerted the greatest influence that caused mobile telephony usage among these students. Simpasa and Guara, (2012) found that the M-Pesa has a velocity three times higher than the actual money transaction velocity. This increases the effective money and hence inflation. They further concluded in their research that M-Pesa helps in the rise of inflation this was in contrast to Aron and Muelbauer, (2015) who investigated the relationship between mobile money and inflation in Uganda, in their study they found out that mobile money does not causes inflation. But it helps in its reduction because mobile money reduces transaction costs, and consequently the employment rate increases since the business has surplus that they can create new jobs.

Khan (2009) studied cashless transactions and its perception on payment of products. He found that when the people are using hard cash they spend less regarding when they are using mobile money payment .When the people are using hard cash instead of mobile money they are aware what they are paying. Because they are conscientious that they are exchanging something which is very important but when they are paying with the use of mobile money transfer they are unconscious for the price of goods. For instance when the person is using mobile money he does not gives attention to the price of the goods and services, since he does not touch any hard cash he spends more than he spends when he uses hard cash. Consequently, the demand of

goods and service increases with use of mobile money transfers so that if the aggregate demand increase does not get an increase of aggregate supply of goods and service inflation will occur. This happens because with tangibility of notes and coins create awareness that something of value is being exchanged. This is in part, intensified by the consumers' ability to process transactional information using perceptual senses such as sigh and touch and translates into an immediate experience of the amount spent, but when paying with mobile money the consumer only has to put numbers in a message box and then send it. It is plausible that at the transaction point the consumer is more aware of the price of the good if they pay with a cheque or cash than through a mobile phone.

Jack, Suri and Towsand (2010) investigated the role of monetary theory in understanding Mobile banking. They found that monetary theories match the reality of mobile money. For example the central bank can intervene to relax liquidity constraints. The central bank can also allow the Telecommunication companies that provide Mobile money service by issuing E-money to their agents to use in cash- in process. For instance the companies issuing E-money that the central bank allows then this E-money is then transferred to the accounts of agents to use it for the cash- in process where the customer brings hard cash and exchanges it to E-money. This does not create new currencies but it uses existing money that the Central Bank manages. On the other hand the companies are required to have the net demand of their agents. The Central banks can manage the demand and supply of mobile money because it controls the issuing of E-money, when the quantity of E-money increases the demand of mobile money decreases and vice versa. So that the central bank control the mobile money services because it deals the Telecommunication companies like other financial institutions.

Andresen (2013) studied how electronic money can easily control an overheated economy through controlling currency circulation velocity not supply of money. He argues that this control works if electronic money combined with understanding the concept of Modern theory. According to his study the velocity of money circulation can be controlled through charges over electronic moneys that are held in electronic systems and electronic moneys that are transferred in electronic systems, this allows the government to control the quantity of money without controlling the supply of money. For example when the government decreases the interest of holding money in electronic systems it increases the quantity of money in the circulation because the velocity of money in circulation increases. If the government increases the interest of held money in electronic systems, then velocity of circulation decreases and consequently the quantity of money decreases. Because the decrease of interest, causes the users of electronic money to transact more than before the interest, and when decreased will cause the subscribers to withdraw their money from the electronic system, consequently, they will put more hard cash into the market. However, when the interest of holding money in electronic money increases many of them are going to keep their money in the electronic systems.

2.2.2 Demand of mobile money and inflation

Econonides and Jeziorki (2015) analyzed the effects of mobile money transfers in Tanzania and found out that the demand of mobile money increases as the cash-out fee decreases. To describe the demand of mobile money they estimated a structural model of demand for person to person transfers and for money transportation and storage. They used a panel data set on all mobile money transactions from Dec 2012 to Feb 2013. They found that on average senders of P2P transfer are price-inelastic. However they found that the customers are heterogeneous and respond quite differently to changes in fees. In particular, those customers who execute large transactions are usually more price inelastic than consumer who executes smaller transactions. Additionally, they found that the demand for long-distance transfer is less elastic than for short-distance transfers. They also found that if fees of cash-outs are set at Zero the demand will increase 78%. On the other hand they found that increase of cash-out fees the demand reduces 3%. Also they found that an increase of transfer fees decreases the demand of mobile money by 2.5%.

Fujiki and Tanaka (2013) studied the Currency Demand, New Technology and the adoption of Electronic Money with an evidence using Individual Household Data from Japan. They found that households were more likely to adopt electronic money if they are in their thirties, or had a self-employed head with tertiary education and had a greater exposure to the new payment mode. In addition, they found out that the average cash balances increase with the adoption of electronic money. Furthermore, they also found that households at lower quintiles of cash balance distribution tended to hold more cash after adopting electronic money. According to their research the cash balances that the households demand didn't decreases with the adoption of electronic money.

2.2.3 Mobile money and exchange rates fluctuations

According to Penicaud and McGrath (2013), the Somaliland money exchangers are key stake holder to the Zaad money transfer Telesom, they help and facilitate and expand mobile money transfer, because they change the Somaliland shilling from Zaad users to perform cash–in transactions since Zaad Telesom only accepts US dollars. So that there is direct relationship between mobile money transfer and exchange rate fluctuations, when the demand of mobile money transfer increases the Somaliland shilling depreciates against dollars hence inflation occurs, in contrast of this if demand of mobile money decreases the value of the Somaliland shilling appreciates on dollars.

Micheal (2006) investigated the dollarization and inflation control in Vietnam; he found that the inflation is explained by exchange and excess money. Hence, in dollarized economy, the relevant concept of money should include foreign currency deposits held in the domestics banking system. Additionally he found that dollarized economies are linking to inflation. Controlling monetary expansion requires controlling the exchange rate. Also it was found that money matters to the inflation process in such an economy, but only when dollar holdings are included. The impact of exchange rate variations would be underestimated and the impact of money would be misjudged if the impact of dollarization is not taken into account explicitly.

Madesha, Chidoko and Zivanomey (2013) had investigated the money casualty relationship between exchange rate and inflation in Zimbabwe. They found that exchange rates and inflation have bidirectional impact in Zimbabwe. They recommended in order sustaining economic growth exchange rates should be used as an instrument of fiscal policy rather than monetary policy instrument. According to this study, the exchange rate causes inflation and inflation cause an exchange fluctuation. For example if the local currency depreciates against the dollar then the price of goods and service that is dominated by the dollar increases because the local currency loosed its purchasing power , on the other hand if the price of imported goods increases because of the demand and supply it also causes the exchange rate fluctuation. So that any policy that is used to solve the problem of inflation must also solve the exchange rate simultaneously, in order to insure this we have to make the exchange rates an instrument of fiscal policy and inflation as an instrument of monetary policy then these two policies must work in complementary

2.2.4 Effective Inflation Control

Inflation may reduce a country's international competitiveness, by making its exports relatively more expensive, thus impacting on the balance of payments. Moreover, inflation can interact with the tax system to distort borrowing and lending decisions. Firms may have to devote more resources to dealing with effects of inflation. Inflation has unrelentingly been moving upward in Somaliland because of the years of neglect of the social infrastructure and general mismanagement of the economy. Currently, inflation is double-digit and surplus shilling in circulation, scarcity of food, and fuel are part of the problems (SEC, 2014).

SEC (2014) further points out that the industry inputs are becoming very expensive and the consumer price index shows that cost of living is sky rocketing. In organized economies costs are volatile and susceptible to "supply shocks and acts of nature" and price would settle after the forces that instigated the increase were resolved. That is not cases in Somaliland where prices keep rising without obeying the law of gravity currently.

Business watch changes in the costs of inputs and fuel and electricity are the economy's most visible inputs. The ordinary folks feel the pain every day if they don't buy fuel because they buy food every day. The recent increase in the prices of petroleum product shows the political leaders are yet to understand that any spontaneous increase in the price of fuel would push up inflation and impacts negatively on the entire economy. The inflation problem has been going on for a while, and the menace may continue because the causes of inflation in Somaliland are not yet clear, in fact the government is treating symptoms instead of the actual inflationary disease (SEC, 2014).

2.4 Findings and Gaps from Empirical Literature

Simpasa and Guara (2012) did not examine the alternative specifications or measures of the deep characteristics of the countries such as rainfall data to capture domestic supply shocks and to substitute world prices by import price index also the paper did not analyze the disaggregation of the different Components of CPI which would also offer more insights into the different aspects of inflation.

Aron and mailbuer (2015) investigated the relationship between mobile money and inflation in Uganda. In their study they got statistics inflation data from Uganda CPI which lacks several key components such as domestic labour cost and whole sale prices indices. Also they used deviation of actual rainfall in four principal growing regions. Since the rainfall varies from one country to another their research cannot be generalized. Furthermore, mobile money transfer that they studied used local currency while in Somaliland and Somalia the mobile money transfer uses foreign currency namely the US Dollar. Consequently their findings are not applicable to country that uses dual currency.

Khan (2009) Studied cashless transactions and its perception in payment of product. In his research he failed to analyze how people perceive 'cash' to ascertain that mobile payment encourages consumers to spend more. Econonides and Jeziorki (2015) analyzed the effects of mobile money transfers in Tanzania. They failed to investigate the effect of an incentive compatible and Pareto superior price discrimination scheme that sets the cash-out fee to zero for money received through a transfer while setting the cash-out fee a bit below the transfer fee for money that was deposited and withdrawn by the same person.

Micheal (2006) investigated the dollarization and inflation control in Vietnam. He used Vector autoregressive model, which criticized because they do not shed any light on the underlying structure of the economy. Also he took Vietnam as case study which has different social culture. In addition, the research analyzed the exchange rate fluctuation and CPI data from 1990 to 2000 which is before the mobile money transfer has emerged.

Madesha, Chidoko and Zivanomey (2013) used Granger Causality test methodology which is not necessarily true causality. If both X and Y is driven by a common third process with different lags, one might still fail to

reject the alternative hypothesis of Granger causality. Yet, manipulation of one of the variables would not change the other. Indeed, the Granger test is designed to handle pairs of variables, and it may produce misleading results.

Jack, Suri and Tows (2010) investigated the role of monetary theory in understanding Mobile banking. They failed to investigate how the central interference to relax liquidity constraints, by issuing E-money. For example, they might interfere with liquidity constraints that are caused by high demand of mobile money transfer by issuing E-money that the Telecommunication can exchange it to hard cash from time to time under the supervision of the central bank.

Fujiki and Tanaka (2013) investigated the effect of electronic money on demand of money, in their survey study they used internet to conduct it so that their data is biased in addition to this they use cross-sectional in their analysis which is not suitable for forecasts. So they failed to use appropriate methods for their data collection and analyzing.

3. RESEARCH DESIGN AND METHODOLOGY

3.1 Research Design
Research design is the plan and procedure for research that span the decisions from broad assumptions to detailed methods of data collection and analysis (Cresswell, 2008). The researcher employed descriptive research design. A descriptive study describes the world as it exists and demonstrates relationships between varying variables.

3.2 Target Population
The target population is the entire aggregation of respondents that meet a set of criteria (Burns and Grove, 1997). The target population was 220 respondents, which comes from foreign exchange traders that work in the Hargeisa Foreign exchange market and Zaad staff as shown in the table 3.1.

Table 3.1: Target Population

Description of respondent	Number of respondent
Exchange dealers	120
Zaad head managers	3
Zaad branch managers	16
Zaad staff	81
TOTAL	220

3.3 Sampling procedure and sample size
Sampling procedure or technique is the process of selecting a number of individuals for study, in such a way that the individuals selected represent the large group from which they were selected (Philip, 2013). The researcher selected the money exchangers dealing in foreign exchange using stratified random sampling technique. Stratified random sampling is used when the study population is heterogeneous (Fink, 2011).

This technique is useful in such researches because it ensures the presence of the key subgroup within the sample. In this study the researcher highlighted three subgroups in Zaad which were as follows head quarter managers and staffs, who were mainly the managers of sixteen branches of Zaad in Hargeisa, and the third groups was Zaad staffs which do daily activity of Zaad services. Also the researcher highlighted exchange traders who work in Hargeisa foreign exchange market. The sample size was 119 respondents that were more than 30% of the proffered sample size (Mugenda and Mugenda, 2003). This is as shown in the table below;

Table 3.2: Sample Size

Group	Number	Sample size	Percentage
Directors	3	3	100%
Branch managers	16	16	100%
Exchangers	120	60	50%
Zaad staff	81	40	50%
TOTAL	220	119	54%

$$Ss=\frac{ss}{1+\frac{ss-1}{Pop}}$$

Where

Ss= sample size of unknown population or infinite population

Z= confidence level

p = percentage picking a choice, expressed as decimal

c = confidence interval, expressed as decimal

Pop= population.

The sample size of this studywas derived with this equation and with confidence interval or error correction of 6.1 and with confidence level of 95%.

$$\frac{258}{1+\frac{258-1}{220}}=119$$

3.4 Data Collection procedures

The study used both primary and secondary data. Primary data was collected by use of questionnaire method while secondary data was collected from published materials. Questionnaire is a well-established tool for acquiring information from respondents (Bird, 2006). It is an easy method that data can be collected from the respondent on the other hand it's a cheaply administered tool.

According to Mohamed and Ahmad (2012), intervening variables are an extraneous variables that affects study variables, they can be controlled in the analysis stage using multilevel regression analysis that shows how much it distorts the relationship between dependent and independent variables, so that in this study the researcher used multilevel regression analysis to control the interference variables that affects the relationship between Zaad service and effective inflation control.

3.5 Pilot Test

According Monette (2002), a pilot study is a small trial that runs of all the procedures planned for use in the main study. The fundamental purpose of pilot study is to examine the feasibility of an approach that is intended to be used in a larger scale study (Leon, 2011).In this study the researcher took 1% (2 respondents) from total sample respondents which were 119 respondents. This is to insure the validity and the reliability of the study.

3.6 Reliability Test

Thanasegar (2007) defines reliability as the degree to which measures are free from error and therefore yield consistent result.Reliability will be tested by use of the Cronbach's alphawhich was developed by Lee Cronbach in 1951 to provide a measure of the internal consistency of a test or scale expressed as a number between 0 and 1.The researcher measured the reliability of the questionnaire to determine its consistency in testing what they are intended to measure and their consistency with a reliability coefficient range of0 to 1.The higher the co efficiency the higher reliability (Kimberline and Winterstan, 2008). According to Tavakol and Dennick (2011), alpha range from 0.7-0.95 is acceptable.

3.7 Validity Test

Kimberline and Winterstain (2008) define validity as the extent to which an instrument measures what it purports to measure. The validity measurement must measure what it supposes to measure without interfering with other factors. In this study the researcher constructed a validity measure that was employed in determining the theoretical relationships of the dependent variables to the independent variables and crossed to the intervening variables. The researcher compared his study with other studies that carried out related topics to ascertain the validity of his research.

3.8 Data analysis and Presentation

According Lacey and Luff (2001), data analysis is the process of systematically applying statistical and/or logical techniques to describe and illustrate, condense and recap, and evaluate data. Statistical Package for Social Sciences (SPSS) version 21 was used to aid in coding, entry and analysis of data obtained from the questionnaires. Quantitative data was analyzed using percentages, tables and charts where necessary to enhance their understanding then the data will be presented using statistical tables, pie charts and bar graphs. The study used multilevel regression analysis to analysis the relationship of dependent variable (inflation control) and independent variable (mobile money transfer).

$Y=\beta 0 + \beta 1 X1 + \beta 2 X2 + \beta 3 X3+\epsilon$

Where

Y= dependent variable (inflation control)

X1= Demand and supply of mobile money transfer

X2=exchange control

X3=Mobile money transfers

$\beta 0$ = Co-efficient of the model

$\beta 1 – \beta 3$ = Beta Co-efficient of Determination

ϵ = Stochastic Error Term

4. FINDINGS AND DISCUSSION

4.1 Respondents' demographics

4.1.1 Gender of respondents

From table 4.1, 61.3% of the respondents were male while 38.7% of the respondents were female. This implies that most of the respondents were males. Also the researcher was not prejudiced since he researched on both genders.

Table 4.1: Gender of respondents

	Frequency	Percent
Male	73	61.3
Female	46	38.7
Total	119	100.0

4.1.2 Age of the respondents
From the table 4.2, 22.7% of the respondents were between 15 and 25 years old, 47.1% of the respondents were between 25 and 35years and 18.5% of the respondents were between 35 and 45 years. This implies that most of respondents were young and energetic to better work even for long hours and hence fit to answer study questions.

Table4.2:- Age of the respondents

	Frequency	Percent
15-25 years	27	22.7
25-35 years	56	47.1
35-45 years	22	18.5

4.1.3 Educational level of the Respondents
From table 4.3 shows that 25.2% of the respondents were completed intermediate level of education, 52.1% completed secondary school, 10.1% of the respondents were holding bachelor degree and 12.6% were holding master degree. This implies that most of the respondents were qualified to work with the organization and to give important input to this study.

Table 4.3: Educational level of Respondents

	Frequency	Percent
Intermediate	30	25.2
Secondary	62	52.1
Bachelor	12	10.1
master degree	15	12.6
Total	119	100.0

4.1.4 Working experience of the respondents
From table 4.4, 49.6% of the respondents have been working as money exchangers for over six years, 23.1% of the respondents have been working as exchanger between five to six years, 17.9% of the respondents were working as exchanger between three to four years while 9.4% of the respondents have working as exchanger for one to two years. This implies that most of the respondents had experience and hence were vital to input their contribution on the research questions.

Table 4.4: Working experience of the respondents

	Frequency	Percent
above 6 years	58	49.6
5 to 6 years	27	23.1
3 to 4 years	21	17.9
1 to 2 years	11	9.4
Total	117	100.0

4.2 Mobile money and inflation control
4.21 Mobile money deposits and inflation rate
From table 4.5, 41.2% of the respondents strongly agree that the increase of mobile money deposits increases the inflation rate, 18.5% of the respondents agree that the increase of mobile money deposits increases inflation , 4.2% of the respondents did not know whether the increase of mobile money increase inflation rate or not,17.6% of respondents disagree that the increase of mobile money deposits increases the inflation and 18.5% of the respondents strongly disagree that the increase of mobile money deposits increase inflation rate. This study finding indicates that to some extent as per respondent's views, mobile money deposits causes inflation in Somaliland.

Table 4.5: Mobile money deposits and inflation rate

	Frequency	Percent
strongly agree	49	41.2
Agree	22	18.5
not know	5	4.2
Disagree	21	17.6
strongly disagree	22	18.5
Total	119	100.0

4.2.2 Mobile money withdraws decrease the inflation rate
From table 4.6, 21% of the respondents strongly agree that the increase of mobile money withdraws decrease the inflation rate, 27.7% agree, 13.4% did not know while 16.8% disagree and 21% strongly disagree. This implies that the mobile money transfer withdraws can to a large extent decrease inflation rate in Somaliland.

Table 4.6: Mobile money withdraws and inflation rate

	Frequency	Percent
strongly agree	25	21.0
Agree	33	27.7
not know	16	13.4
Disagree	20	16.8
strongly disagree	25	21.0
Total	119	100.0

4.2.3 The price of fuel and food when the deposit of mobile money increases

From table 4.7, 37.8% of the respondents strongly agree that the price of the fuel and food increases when the deposits of mobile money service increases. 25.2% agrees, 8.4% does not now 15.1% disagreed while 13.4% strongly disagreed. This implies that mobile money transfer deposits increases the price of fuel and food, hence it helps the increase of inflation this contrasts the argument of Aron and Macbuer (2012) who studied the relationship between mobile money transfer and the food and fuel inflation in Uganda and they found out that mobile money deposits does not cause food and fuel prices to increase

Table 4.7: The price of the fuel and food when the mobile money deposits increase

	Frequency	Percent
strongly agree	45	37.8
Agree	30	25.2
Not known	10	8.4
Disagree	18	15.1
strongly disagree	16	13.4
Total	119	100.0

4.2.4 Mobile money withdraws and the price of the fuel and food

From table 4.8, 16.8% of the respondents strongly agree that the increase of mobile money withdraws decreases the price of the fuel and food, 32.8% agree, 16% not know, 13.4% disagree and 19.3% strongly disagree. This implies that the increase mobile money withdraws can helps in the reduction of inflation rates.

Table 4.8: Mobile money withdraws and the price of the fuel and food

	Frequency	Percent
strongly agree	20	16.8
Agree	39	32.8
Not known	19	16.0
Disagree	16	13.4
strongly disagree	23	19.3
Total	119	100.0

4.2.5 Mobile money and exchange fluctuation

Table 4.9 shows that 11.8% of the respondent agreed that mobile money transfer does not affect exchange rate fluctuations ,19.3% agree, 6.7% not known, 15.1% disagree and 39.50% strongly disagreed that mobile money doesn't cause exchange fluctuation. This implies that exchange fluctuation is highly influenced by mobile money transfer.

Table 4.9: Mobile money transfer and exchange rate fluctuation

	Frequency	Percent
strong agree	14	11.8
Agree	23	19.3
Not known	8	6.7
Disagree	18	15.1
strongly disagree	47	39.5
Total	119	100.0

4.2.6 Mobile money and   inflation

From table 4.10, shows that 13.8% of the respondents strongly agree that mobile money does not cause inflation, 21.1% agree, 15.6% not sure about it, 30.3% disagree and 19.3% strongly disagree that mobile money does not cause inflation. The above findings suggest that mobile cause inflation since majority of respondents disagree i.e. 30.3% of the respondents

Table 4.10: Mobile Money and Inflation Cause

	Frequency	Valid Percent
Strongly agree	15	13.8
Agree	23	21.1
not known	17	15.6
Disagree	33	30.3
Strongly disagree	21	19.3
Total	119	100.0

4.2.7 Inflation controlled by mobile money transfer

From table 4.11 below, 32.7% strongly agreed that control of mobile money transfer inflation can be controlled, 30.8% agreed 8.4% didn't know, 13.1% disagreed and 15% strongly disagreed. This implies that mobile money control can be a tool for control of inflation in Somaliland Pandemic.

Table 4.11: The control of mobile money transfer inflation can be controlled

	Frequency	Percent
Strongly agree	35	32.7
Agree	33	30.8
Not know	9	8.4
Disagree	14	13.1
Strongly disagree	16	15.0
Total	119	100.0

4.2.8 Mobile money transfer as inflation control tool

Table 4.12 shows that 27.7% of the respondents strongly agreed that central bank can use mobile money transfer as inflation control tool, 10.9% agreed, 21.8% didn't know, 23.5% Disagreed while 16% strongly disagreed. A majority of respondents agree in the notion that central bank can use mobile money transfer as an important tool to control inflation.

Table 4.12: Mobile money transfer as inflation control tool

	Frequency	Percent
Strongly agree	33	27.7
Agree	13	10.9
Not known	26	21.8
Disagree	28	23.5
Strongly disagree	19	16.0
Total	119	100.0

4.2.9 Relationship between mobile money transfer and inflation control

From table 4.13, findings shows that there is weak positive relationship between mobile money transfer and inflation control at Pearson correlation coefficient r=0.307[**]. This relationship is insignificant and hence mobile money transfer merely affects inflation control.

Table 4.13: Relationship between mobile money transfer and inflation Correlations

		Inflation control	Mobile money transfer
Inflation control	Pearson Correlation	1	.307[**]
	Sig. (2-tailed)		.001
	N	119	107
Mobile money transfer	Pearson Correlation	.307[**]	1
	Sig. (2-tailed)	.001	
	N	107	107

4.3 Demand and supply of mobile money

4.3.1 Mobile money transfer and demand

From table 4.14, 35% of the respondents strong agreed that easy usage cause demand increase of mobile money transfer. 17.9% agreed, 19.7% didn't known, 19.7%disagreed and 7.7% strongly disagreed. The above statistics reveals the increased demand for mobile money transfer is caused by its usage.

Table 4.14: Mobile money transfer and demand

	Frequency	Percent
Strongly agree	41	35.0
Agree	21	17.9
Not know	23	19.7
Disagree	23	19.7
Strongly disagree	9	7.7
Total	119	100.0

4.3.2 Commercial bank absenteeism and demand of mobile money

From table 4.15, 20.2% strongly agreed that demand of mobile is increased because of the absent of commercial banks, 16.8% agreed, 16% were not sure, 9.2% disagreed and 28.6% strongly disagreed. This statistics indicate that increasing demand of mobile money cannot be attributed to the shortage of commercial banks in Somaliland.

Table 4.15: Commercial bank absenteeism and demand of mobile money

	Frequency	Percent
Strongly agree	24	20.2
Agree	20	16.8
Not know	19	16.0
Disagree	11	9.2
Strongly disagree	34	28.6
Total	119	100.0

4.3.3 Mobile money and Remittance

From table 4.16, 24.3% respondents strongly agreed that demand of mobile money service increases due to remittance operations, 33% agreed, 16.5% didn't know while 7.8% disagree and 18.3% strongly disagree. Many respondents believes that remittance needs contribute to the rise of mobile money in Somaliland due to the fact that people may wish to send money to their relatives who are upcountry and who are not within the reach of commercial banks such as Dahabshil Bank and Salaama Bank.

Table 4.16: Mobile money and Remittance

	Frequency	Percent
Strong agree	28	24.3
Agree	38	33.0
not know	19	16.5
Disagree	9	7.8
Strongly disagree	21	18.3
Total	119	100.0

4.3.4 Mobile money service as saving account

From table 4.17, 36.1% of the respondents strongly agreed that many people use mobile money transfer as saving account and keep their money for long time,10.9% agreed,21% were not sure,12.6% disagreed and 15.1% strongly disagreed. This implies that mobile money service fills the demand of bank for many users. In terms of providing opportunity of accepting demand deposits perhaps with the emergence of more bank within the country. The usage of mobile money might decline

Table 4.17: Mobile money service as saving accounts

	Frequency	Percent
Strong agree	43	36.1
Agree	13	10.9
not known	25	21.0
Disagree	15	12.6
Strongly disagree	18	15.1
Total	119	100.0

4.3.5 Demand and Supply of mobile money and Inflation control

Table 4.18 shows that there is weak positive relationship between demand of mobile money transfer and inflation control at Pearson correlation coefficient r=0.488(**).This implies that controlling the demand and supply of mobile money transfer may not necessary help inflation control within Somaliland.

Table 4.18: Demand and Supply of mobile money and inflation control

		Inflation control	Demand and supply of mobile money
Inflation control	Pearson Correlation	1	.484**
	Sig. (2-tailed)		.000
	N	107	105
Demand and supply of Mobile money	Pearson Correlation	.484**	1
	Sig. (2-tailed)	.000	
	N	105	117
**. Correlation is significant at the 0.01 level (2-tailed).			

4.4. Mobile money and exchange rate fluctuations
4.4.1 Daily Dollar exchanged

From table 4.19, 42% of the respondents exchange each day between $100 and $400, 31.1% of the respondent exchange each day between $500 and $800, 8.4% of the respondents exchange each day between $800 and $1,200 while 10.9% exchanges above $1,200. The above statistics reveal that many exchequers exchange $100-$400, the amounts are quite considerable and may not too great extent result inflation increase.

Table 4.19: Daily Dollars exchanged

	Frequency	Percent
$100-$400	50	42.0
$500-$800	37	31.1
$800-$1,200	10	8.4
above $1,200	13	10.9
Total	119	100.0

4.4.2 Somaliland shilling exchanged before Zaad

From table 4.20 shows that 39.5% of the respondents exchanges between 100,000 and 1,000,000 Somaliland shillings to dollars, 16% of the respondents exchanges 1,000,000 and 10,000,000, 28.6% of the respondents 15,000,000-20,000,000 while 13.4% of the respondents above 20,000,000 exchanges. This implies that the demand of dollars was less

Table 4.20 Somaliland shilling exchanged before Zaad emerged

Somaliland shilling	Frequency	Percent
100,000-1000,000	47	39.5
1,000,000-10,000,000	19	16.0
15,000,000-20,000,000	34	28.6
above 20,000,000	16	13.4
Total	119	100.0

4.4.3 Somaliland shilling exchanged after Zaad

From table 4.21, 19.3% respondents exchanges after mobile money (Zaad) has emerged between 100,000 and 1,000,000 Somaliland shillin,18.4% between 1,000,000 and 10,000,000, 27.2% between 15,000,000 and 20,000,000 while 35.1% above 20,000,000. This implies that the demand of dollar increased after mobile money has emerged. This is because Zaad user needs dollars to make Zaad deposit transactions.

Table 4.21: Somaliland shilling exchanged after Zaad has emerged

Somaliland Shillings	Frequency	Percent
100,000-1,000,000	22	19.3
1,000,000-10,000,000	21	18.4
15,000,000-20,000,000	31	27.2
above 20,000,000	40	35.1
Total	119	100.0

4.4.4 Daily Hard cash deposits to Zaad

From table 4.22, 36.1% of the respondents deposit between 10$ and 100$, 26.1% $100-$300, 21.8 $300-$600 and deposit between 16% deposits above $1,200. This implies that the most of users make small deposits suggesting that big deposits may be as due to bank transfer to Zaad.

Table 4.22: Daily Hard cash deposits to Zaad

	Frequency	Percent
$10-$100	43	36.1
$100-$300	31	26.1
$300-$600	26	21.8
above$600	19	16.0
Total	119	100.0

4.4.5 Daily Zaad Withdrawals

Table 4.23below shows statistics on daily withdrawals from Zaad 42% of respondents indicated that between 100 and 300 users make withdraws, 23.5% indicated that between 300 and 500 users make withdraws, 17.6% of respondents indicated that between 600 and 1000 users makes withdraws while 14.3% indicated that more than 1,000 users makes withdraws. These statistics is attributed to view that very few users withdraw their money from Zaad (Mobile money transfer).

Table 4.23 Daily Zaad Withdrawals

	Frequency	Percent
100-300 users	50	42.0
300-500 users	28	23.5
600-1,000 users	21	17.6
above 1,000 users	17	14.3
Total	119	100.0

4.4.6 Daily withdraws from Zaad in dollars

From table 4.24, the majority of the respondents 44.5% reveal that users withdraw between $10 -$100, 23.5% of respondents had Zaad customers making between $300-$500 withdraws, 14.3% of respondents that their customers made between $600-$1,000 withdraws, while only 12.6% of respondent had their customers that make above $1,000 withdraws. Many Zaad users therefore make small withdraws and this agree to the Permian majority of respondents arguments that Zaad users use it as savings tool.

Table 4.24: Daily withdraws from Zaad in dollars

	Frequency	Percent
10-100$	53	44.5
$200-$400	32	26.9
500-800$	17	14.3
above 800$	15	12.6
Total	119	100.0

4.4.6 Relationship between exchange rate control and inflation control

The study findings on the relationship between exchange rate control and inflation control indicate a weak negative correlation of coefficient -0.229*. This indicates that exchange rate control is not to a great extent likely to contribute to inflation control in Somaliland. To be able to control inflation rates within the country, the government through the central bank should devise other techniques since exchange rate control is not adequate. The above findings are illustrated in table 4.25.

Table 4.25: Relationship between inflation control and exchange rate control

		Inflation control	Exchange rate control
Inflation control	Pearson Correlation	1	-.229[*]
	Sig. (2-tailed)		.022
	N	109	100
Exchange rate control	Pearson Correlation	-.229[*]	1
	Sig. (2-tailed)	.022	
	N	100	110
*. Correlation is significant at the 0.05 level (2-tailed).			

5. CONCLUSION, SUMMARY AND RECOMMENDATION

5.1 SUMMARY

5.1.1 Mobile money Transfer and inflation control in Somaliland

41.2% of the respondents strongly agreed that mobile money transfer causes inflation rate to increase, this finding show that most of the respondents believe that mobile money deposits increases the inflation rate in Somaliland. 27.7% agreed that mobile money withdraws can large extent decrease the inflation rate in Somaliland. This finding indicates that most respondents believe that mobile money withdraws can reduce the inflation rate into an extent. In other words according to the above findings the inflation rate increases with the increase of mobile money deposits and decreases with the increase of withdraw.

37.8% of the respondents strongly agreed that the price of the fuel and food increases when the mobile money deposits increases. These findings show that the majority of the respondents believe that the price of fuel and food are affected by the mobile money deposits. 32.8% agreed that the price of fuel and food decrease when the mobile withdraws increases. This indicates that most of the respondents are with the notion that the price of the fuel and food decreases when the mobile money withdraws increases. Based above findings the price of the food and fuel increase with the increase of mobile money deposits and decrease with the increase of mobile money withdraws.

30.3% disagreed that mobile money does not causes inflation. These findings suggest that mobile money causes inflation since majority of the respondents disagree. The study findings are in contrast with those of

Aron and Maulbier (2015) who studied the relationship between mobile money and inflation in Uganda and found that mobile money doesn't cause inflation.

However, Simpasa and Gurer (2012)'s study of the causes of inflation in Kenya found that M-Pesa causes inflation. The reason that Mobile money causes inflation in both Kenya and Somaliland is the number of users both Kenya and Somaliland adapted mobile money in the early days of its emergence. 32.7% of the respondents strongly agreed that control of mobile money inflation can be controlled. This implies that control of mobile money can be tool for inflation control in Somaliland.

Many respondents (27.7%) strongly agreed that central bank can use mobile money as an inflation control tool. This implies that central bank can use mobile money transactions inflation control tool. This tool can be like reserve requirement ratio that central bank use to control inflation when commercial banks are working. The reserve requirement ratio used to control amount of money in the market by changing the ratio. Like that central bank can use mobile money by changing the issue of e-money which mobile money service uses to exchange with the hard cash. The findings shows that there is weak positive correlation between mobile money transfer and inflation control a Pearson correlation coefficient r=0.307**. This indicates that mobile money transfer can be inflation control tool.

5.1.2 Demand and Supply of mobile money helps inflation control.

35% of the respondents strongly agreed that easy usage of mobile money increase its demand. This reveals that with the advance of technology the mobile money demand increase because its usage increases and the other factor that makes the mobile usage easy is the customer experience. The mobile money has been used for the last six years this increased experience of Zaad (Somaliland Mobile money transfer) users. Since the above two factors are increasing along the time the demand of mobile will also increases.

28.6% of the respondents disagreed that absence of commercial banks increases the demand of mobile. This statistical indicates that mobile money demand cannot be attributed with the shortage of commercial banks, this because most Mobile money users in Somaliland are small depositors and also they are not happy with the current banking system in the country. After civil war in Somaliland, most people became afraid of using banking accounts because they lost their deposits after the central bank of Somalia has collapsed.

33% of the respondents agreed that the demand of mobile money increased due to the remittance operations. Many mobile money users send money to their relatives who are upcountry were the ordinary remittance cannot operate. This indicates that mobile money service is substitute of ordinal remittance. 36.1% of the respondents strongly agreed that many people use mobile money transfer as saving accounts and keep their money for long time. This indicates that many users use mobile money transfer as a bank. So that using mobile money transfer can add value to bank services. The findings shows that there is weak positive relationship between demand and supply of mobile money and inflation control at Pearson correlation coefficient r=0.484**. This implies that controlling demand and supply may not necessarily help inflation control.

5.1.3 Exchange fluctuation control and inflation control

42% of the respondents stated that they exchange each day $100-$200. This reveals that the dollar exchange is not great extent causes inflation in Somaliland. $100-$200 exchanged might be daily grocery expense for the families that their relative sends money from abroad countries. 39.5% of the respondents stated that they were exchanging between 100,000-1,000,000 Somaliland shillings to US dollars before Zaad has emerged, this because the demand of dollars was so great in those days when the Zaad was not operating. On the other hand 35.10% of the respondents stated that they are exchange above 20,000,000 Somaliland shillings this implies that the demand of US dollars has increased after Zaad has emerged.

36.1% of the respondent stated that they deposit Zaad 10$ to 100$ each day this implies that most of the Zaad users make small deposits each day.42% of the respondents state that the number of users that withdraw their money from Zaad each are between 100-300 users this implies that most of Zaad depositors keep their money for long time. 44.5% of the respondents stated that they Zaad users withdraw between 10$ to 100$.

The findings shows that there is weak negative relationship between exchange rate control and inflation control at Pearson correlation coefficient =-0.229*. This implies that exchange rate is not great likely to contribute inflation control

5.2 CONCLUSIONS

This study show that there is strong relationship between mobile money transfer and inflation control at Pearson correlation coefficient r=0.317[**]. This supports Jack et al. (2010) study who found that those monetary theories match the reality of mobile money. This because the mobile money effectives the circulation of money and the central can manage the supply of hard cash by issuing electronic money that mobile money service uses to exchange it with hard cash this reduces the amount of money hard cash which is in the market. On the other the central bank reduces the electronic money supply to increase the amount of hard cash in the market .this can be done through changes in transferring fees.

This study show that there is strong relationship between mobile money transfer and inflation control at Pearson correlation coefficient r=0.488(**).this implies that the control of the demand and supply of mobile money transfer can be inflation controlling methods. This is a new method that follows the argument of modern monetary theory and electronic money which studied by Andersen (2013). In his study he recommended that the control of electronic money can not only help the central bank to control the quantity of money in the market but more than this it can help the central banks to control the velocity of money circulation. This study show that there is weak negative relationship between exchange rate control and inflation control at Pearson correlation coefficient r=-0.229. This implies that the exchange rate control cannot help inflation control in Somaliland this because Somaliland is unrecognized country that does not hold foreign deposits and also the country does not have commercial banks.

5.3 Recommendation
5.3.1 Policy recommendation
The study recommends to usage of mobile money as inflation control tool but with carefully designed procedures and policies in order to keep customer satisfaction since these procedure affect users directly unlike other inflation control tool like reserve requirement ratio which does not affect the customers directly.
5.3.2 Recommendation for further researches
 The study recommends further research on the effect of mobile money transfer on economic growth for dual currency countries and also a study on the effect of exchange rate control on the control of macroeconomic problems in Somaliland

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