



**Strathmore**  
UNIVERSITY

**ROLE OF AGENCY BANKING IN FACILITATING FINANCIAL INCLUSION IN  
KENYA**

Mutua Eugene Nzioka  
077174

Submitted in partial fulfillment of the requirements for the Degree of Bachelor of  
Business Science Finance at Strathmore University

Strathmore Institute of Mathematical Sciences  
Strathmore University  
Nairobi, Kenya

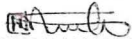
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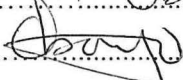
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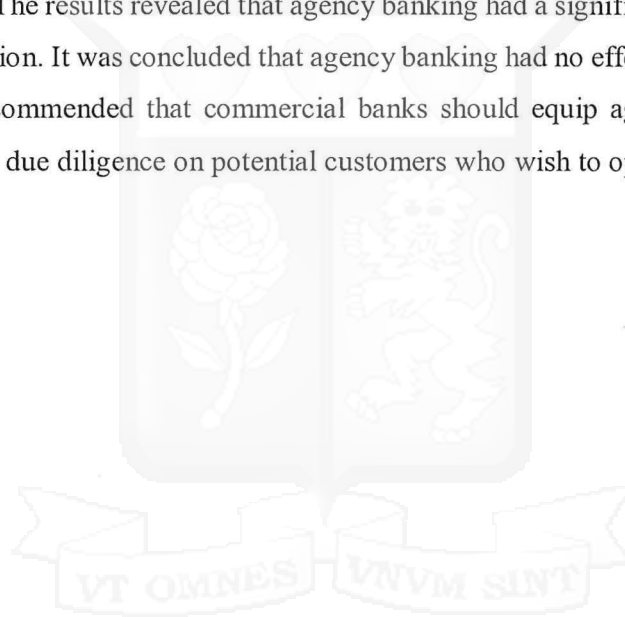
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Strathmore Institute of Mathematical Sciences  
Strathmore University



## ABSTRACT

The research project set forth to evaluate the role played by agency banking in facilitating financial inclusion. The sole objectives of the study were to study and evaluate the effects of the number of agents employed and the effects of bill payments on financial inclusion in Kenya. Secondary data in the CBK annual reports was used in the analysis stage. The sample size was 17 out of 42 commercial banks that constitute banking sector as at December, 2015. Data analysis was done using Stata. The study used correlation analysis, homoscedasticity test, normality test, unit root test and regression analysis to determine the relationship between correspondent banking and financial inclusion. The results revealed that agency banking had a significant positive relationship with financial inclusion. It was concluded that agency banking had no effect on financial inclusion. It was therefore recommended that commercial banks should equip agents with the necessary expertise to conduct due diligence on potential customers who wish to open bank accounts.



## ACKNOWLEDGEMENT

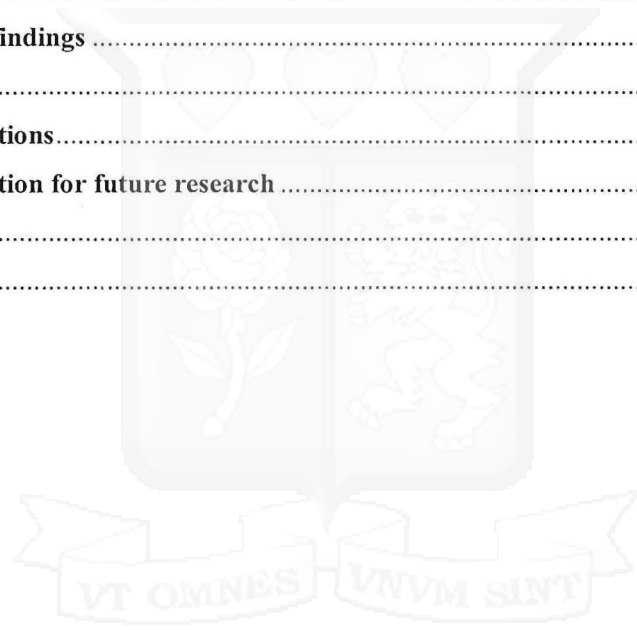
I would like to acknowledge all the people who contributed to the completion of this research project. Many thanks go to Mr. Edwin Obonyo, Mr. Samuel Tiriongo and Dr. Caroline Kariuki for guiding me through this entire process. To my family, thanks for your support and understanding through this entire involving journey and for their encouraging and motivating words.



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## LIST OF ABBREVIATIONS

CBK: Central Bank of Kenya

POS: Point-of-sale

SIM: Subscriber information module

ATM: Automatic teller machine

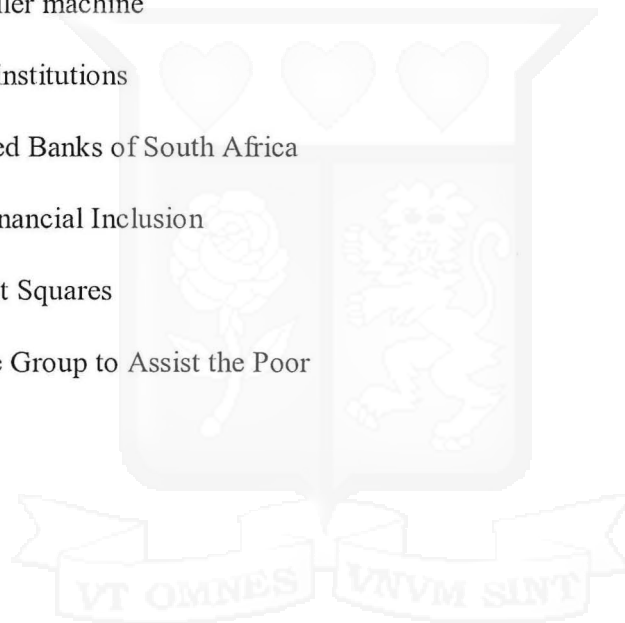
MFI: Microfinance institutions

ABSA: Amalgamated Banks of South Africa

AFI: Alliance for Financial Inclusion

OLS: Ordinary Least Squares

CGAP: Consultative Group to Assist the Poor



# **ROLE OF AGENCY BANKING IN FACILITATING FINANCIAL INCLUSION IN KENYA**

## **CHAPTER 1: INTRODUCTION**

### **1.1: Background**

According to (Mas, 2009) financial markets are not doing a good job in ensuring that the majority in the society have their financial needs catered for in a safe, convenient and affordable way. He further argues that finance as a tool should be used to control hand-to-mouth existence, whereby low income earners who have their income accumulated in a certain period, individuals who are uncertain of future employment opportunities, are able to meet their future financial needs like paying for school fees and medical insurance. Financial institutions offer an avenue for such individuals to engage in finance by enabling them to exchange cash they need to carry out daily transactions for the promise of value (Mas, 2009).

(Sarma & Pais, 2010) define financial inclusion as a process that facilitates usage, availability and easy access to the formal financial system by every individual in the society. Financial institutions should therefore strive to be all inclusive by organizing the market in such a way that all the parties involved receive benefits in the form of clear financial incentives so as to encourage their participation (Mas, 2009). This will require an understanding of factors that influence the acceptance of new products thus creating an environment in which technological advances such as agent banks, which create real value to customers, are accepted by all (Kolodinsky, Hogarth, & Hilgert, 2004). An inclusive financial system helps minimize the growth of all informal lending outlets, enhances management of finances on a day-to-day basis and reduces the cost of capital by facilitating the efficient allocation of resources (Sarma & Pais, 2010).

(Mas, 2009) defines agent or branchless banking as a setup, aimed at facilitating financial inclusion, where banking transactions have been transferred from bank branches into retail outlets in every neighborhood to enable the unbanked population to engage in finance. It is characterized by four main objectives; proximity, trust, technology and government regulation. According to (Siedec, 2008), banking agents are retail vendors or any other trusted local establishments, with low setup and running costs, that process customer payments, deposits, withdrawals and transfers thus helping banks and microfinance institutions to reach more people while still providing more financial products at low costs.

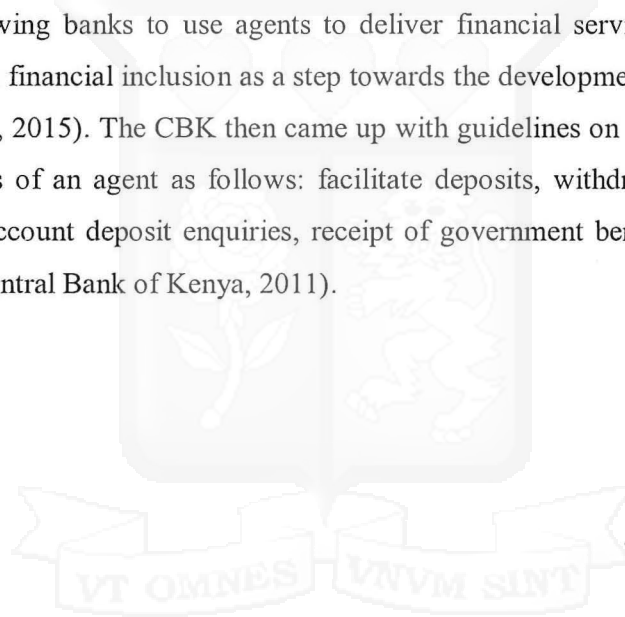
According to (Siedec, 2008), branchless banking has seen enormous growth in many developing countries. In 2005, about a quarter of Brazil's 6000 municipalities had no access to formal banking services. It was prohibitively expensive to reach poor clients in rural areas but banks in Brazil introduced correspondent banking which involved the use of local agents to carry out their operations in the villages. Today, 98% of the country's municipalities have access to banking services thanks to banking agents. It is estimated that one billion USD in transactions were processed Brazil by its 90,000 agents in 2005 and about twelve million accounts opened across the network in 3 years. This kind of success influenced many other markets including Colombia, Peru, Mexico and Chile.

In Colombia, the authorities are committed to developing the use of mobile-phone and card-based branchless banking models to facilitate financial inclusion. Major banks in Colombia are currently using branchless banking in the form of retail outlets to reach new clients (Lozano & Mandrile, 2010). The agent model has however been slower in Colombia, compared to Brazil, which boasts of the largest agent network in the world. According to (Demirguc-Kunt & Klapper, 2012), a large number of the population in the Caribbean and Latin America still has no access to formal financial products and services. Approximately 39% of adults have an account at a formal financial institution.

According to (Demirguc-Kunt & Klapper, 2012), the use of mobile money has achieved the most success in facilitating financial inclusion in Africa with 14% of adults reported to have used mobile money in 2012. Mobile money has enabled millions of individuals who would have otherwise been excluded from formal financial services to carry out financial transactions, sending or receiving money and paying bills, in a secure, reliable and affordable way. The number of adults reported to have been using mobile money were; 16 % in Sub-Saharan Africa, 20% in Eastern and Central Africa, 35% in East Africa and 3% in North Africa.

In Kenya, 68% of adults use mobile money thanks to the launch of M-Pesa service in 2007 (Demirguc-Kunt & Klapper, 2012). According to (CBK, Bank Supervision Annual Report, 2015), By December 2015, 17 commercial banks and 3 microfinance institutions had contracted 40,592 and 1,154 agents respectively across the country. This can be attributed to the increase in confidence and acceptance towards the agency model as an efficient and effective financial services delivery channel. As at December 2015, the banking industry was made up of 43 banking institutions, 42 commercial banks and 1 mortgage finance company (CBK, Bank Supervision Annual Report, 2015).

The CBK, in 2009, introduced new measures that incorporated non-bank agents into the banking channels, thus allowing banks to use agents to deliver financial services in order to alleviate poverty and achieve financial inclusion as a step towards the development blueprint, Vision 2030 (Afande & Mbugua, 2015). The CBK then came up with guidelines on agency banking in which it outlined the roles of an agent as follows: facilitate deposits, withdrawals, payment of bills, transfer of funds, account deposit enquiries, receipt of government benefits and direct deposits from employers (Central Bank of Kenya, 2011).



## **1.2: Problem Statement**

A lot of research has been done on agency banking and the role it plays in facilitating financial inclusion. In Kenya, the studies are not exhaustive as they tend to lean mainly on the use of mobile and internet banking. The low utilization of agent banking by majority of the commercial banks in Kenya is an indicator of some level of exclusion that nobody seems to pay attention to. If we are to achieve the same levels of financial inclusion as Brazil, which uses correspondent banking by employing local agents, we need to put more emphasis on getting as many people as possible to open up bank accounts through bank agents.

According to CBK, in 2012, the increase in the number of branches was higher than the increase in bank agents despite the low costs associated with agency banking with only 13 out of 43 banks having adopted agency banking (Ndungu & Njeru, 2014). Their research looked into some of the factors affecting the adoption of agency banking and they concluded that customer service delivery, security concerns and quality of bank agents directly influenced the adoption of agency banking in Kenya.

(Munoru, 2016) argues that correspondent banking has to a large extent become important in many developing countries over the last decade. He however adds that the extent to which agency banking can be used as a tool to deepen the financial sector remains largely unknown and sets out to investigate some of the transactions that have an impact on financial inclusion in Kenya such as account deposits, number of new accounts opened, payment of retirement and social benefits. He concludes that there is a positive relationship between these transactions and financial inclusion.

This study seeks to evaluate the agency banking model in relation to the number of agents employed and bill payments made through these bank agents in order to establish the impact of agency banking on financial inclusion.

### **1.3: Research Objectives**

The objectives of the study are:

- i. To determine the effect of the number of banking agents employed on financial inclusion.
- ii. To determine the effect of bill payments made through bank agents on financial inclusion.

### **1.4: Research Questions**

- i. What effect does the number of banking agents employed have on financial inclusion?
- ii. What effect do bill payments made through bank agents have on financial inclusion?

### **1.5: Research Hypotheses**

The study tests the following two hypotheses in order to achieve the defined objectives of establishing the role of agency banking in facilitating financial inclusion in Kenya.

H<sub>01</sub>: There is no significant relationship between the number of bank agents and financial inclusion.

H<sub>11</sub>: There is a significant relationship between the number of bank agents and financial inclusion.

H<sub>02</sub>: There is no significant relationship between bill payments and financial inclusion.

H<sub>12</sub>: There is a significant relationship between bill payments and financial inclusion.





## **CHAPTER 2: LITERATURE REVIEW**

### **2.1: Theoretical Review**

#### **2.1.1: Agency Theory**

Agency relationship is one of the oldest and codified modes of social interaction that arises when one party, agent, agrees to act on behalf of another, principal (Ross, 1973). In essence, all contractual arrangements, as between a bank agent and a commercial bank, carry with them important agency elements (Ross, 1973). (Jensen & Meckling, 1976) define agency relationship as a contract under which one or more individuals, principal, engages another individual, agent, to carry out some activities on their behalf by delegating some decision making powers to them.

In the case that both parties to the relationship are utility maximizers, it is very likely that the agent will not always act in the best interests of the principal and will focus on maximizing his own utility instead. The principal is then forced to take measures to ensure that the agent does not diverge from his interests. The principal will therefore have to incur monitoring costs to keep the agent in check or incur bonding costs to ensure that he is well compensated in case the agent engages in activities that are likely to cause them harm. The principal may also suffer residual loss in the case that the agent's decisions do not match those that maximize his welfare (Jensen & Meckling, 1976).

According to (Brigham & Gapenski, 1993), agency theory is built on information asymmetry, where the agent has more information regarding a particular field as compared to the principal, which makes it hard for the principal to effectively monitor the agent to ensure that they act with their interests at heart. It also assumes that both the principal and the agent are rational and will use the contract to maximize their wealth.

### **2.1.2: Bank-led Theory**

Banks use branchless banking through retailers to reduce the cost of delivering financial services, relieve crowds in branches and to establish their presence in new areas. However, in some countries such as Brazil and India, banks use retail agents to fulfil political or regulatory requirements of distributing credit to low income or rural areas that would be unprofitable to venture into using conventional branch based banking (Lyman, Ivatury, & Staschen, 2006).

In its most basic form of the bank-led model of branchless banking, a commercial bank develops financial products and services but distributes them with the help of retail agents who handle most of the customer interactions. The bank however remains the ultimate provider of financial services with whom customers maintain accounts. In this regard, retail agents are tasked with customer interactions, cash-in and cash-out operations, which are similar to how branch-based tellers take deposits and process withdrawals, and in some countries they also handle account opening procedures and servicing of loans (Lyman, Ivatury, & Staschen, 2006).

Retail outlets are equipped to communicate electronically with the respective bank through a mobile phone or a POS terminal that reads cards which then enables the customer to conduct financial transactions once their account is established or loan is approved. The retail agent then confirms the customer's identification details and processes the transaction by debiting the customer's account and crediting the payee's in the case of funds transfer. In other transactions, apart from funds transfer, cash is deposited or withdrawn from the agent's cash drawer. These transactions are then electronically recorded and sent to the bank directly or through a payment processing agent (Lyman, Ivatury, & Staschen, 2006).

In Brazil, banks contract management companies to handle retail agents on their behalf. In such cases, the management companies assume liability for cash handled by retail agents although banks themselves are liable to the customer in events of fraud and negligent retail agents. In other cases, payment processing agents settle transactions between banks (Lyman, Ivatury, & Staschen, 2006).

## **2.2: Empirical Review**

### **2.2.1: Adoption and Growth of the Agency Banking Model**

In Brazil, customers make deposits, pay bills and open bank accounts at small retail outlets whereas private and state-owned banks deliver financial services through retail agents called banking correspondents (Ivatury & Mas, 2008). Correspondent banking arrangement refers to partnerships between banks and retail commercial outlets such as lottery kiosks, post offices, pharmacies and construction goods stores to provide distribution outlets for financial services (Kumar, Nair, Parsons, & Urdapilleta, 2006).

The Reserve Bank of India issued a circular, in January 2016, allowing banks to use post offices, micro-finance institutions including non-profit organizations and cooperatives as retail agents, referred to in the circular as business correspondents. Despite some of the banks having already used MFIs as retail agents for issuing and collecting loans, they were now able to perform other functions such as collecting small-value deposits. However, since the issuance of the circular, there has been virtually no experience with deposit collection as specialized MFIs claim not to see any advantages associated with handling deposit collections for banks (Ivatury & Mas, 2008).

In South Africa, only licensed financial institutions have permission to carry out branchless banking using retail agents. In order to maneuver this regulation mobile operators, non-bank institutions prohibited from accepting public deposits, have partnered with licensed banks through joint ventures to offer cellphone-based banking. This has seen technology firms such as WIZZIT and MTN enter into joint ventures with large banks such as ABSA bank and Standard Bank respectively so as to offer deposits, withdrawals, payments and airtime purchase services through a combination of mobile phone interface, ATMs, bank branches and post offices (Ivatury & Mas, 2008).

In the Philippines, mobile operators have been offering branchless banking since 2000. Globe Telecom's G-Cash service enables customers to load and unload their e-money account, which is tied to a mobile phone SIM card, by depositing and withdrawing cash at retail agents and the mobile operator's dealers. Customers can then store cash, transfer funds, pay bills purchase goods and repay loans using the e-money value in their accounts (Ivatury & Mas, 2008).

In Kenya, Safaricom offers M-Pesa which enables customers to load and unload accounts at retail agents the same way as the G-Cash in the Philippines. Customers use an M-Pesa account linked to their SIM to carry out the same transactions as with G-cash. Similar to what has been witnessed in South Africa, Safaricom has partnered with Commercial Bank of Africa (CBA) and Faulu, a local MFI, to deliver the product. The success experienced by M-Pesa has attracted another branchless banking initiative known as Smart Money, a start-up firm that gives customers prepaid cards that they can use as e-money transaction accounts (Ivatury & Mas, 2008).

### **2.2.2: Financial Inclusion**

Financial inclusion plays an important role in promoting the economic development of developing economies. However, approximately three billion people around the world lack access to formal financial services such as bank account, credit, insurance and a secure and efficient platform for receiving pensions and social benefit payments through a registered financial institution. It has therefore been universally accepted that developing the financial sector and improving access to financial services speeds up economic growth and helps to achieve inclusive growth (Agrawal, 2008).

(Munoru, 2016) defines financial inclusion as the process of ensuring access to financial services and timely and adequate credit where needed by vulnerable groups at an affordable price. He categorizes financial services into loans savings, insurance credit and payments. He further adds that financial systems are expected to provide their service of transferring resources from surplus to deficit units with the aim of alleviating poverty among the poor and low income surplus and deficit units.

According to (Sarma, 2010), several indicators have been used to assess the extent of financial inclusion. These indicators include: number of bank accounts (per 100 adults), amount of bank credit and deposits, geographical penetration, loan and deposit accounts per capita and deposit income ratios. One measure of financial inclusion that is widely accepted universally is the percentage of adult population that has bank accounts (Munoru, 2016). This study will measure financial inclusion using the number of bank accounts per 1,000 adults.

### **2.2.3: Retail Agents Networks**

In developing countries, it is estimated that only a quarter of the households save their money with formal financial institutions. There are about 10% in Kenya, 25% in Mexico, 20% in Macedonia and 32% in Bangladesh. This is because it is costly for banks to build and maintain branches to reach scattered or/and low income households. In order to achieve worldwide access, banks will have to adapt to a low-value, high volume transactional environment and build more flexible, scalable retail network points at which people can conveniently deposit into or withdraw from their accounts (Siedek & Mas , 2008).

Banks can use technology to interact remotely with their customers in a trusted way through retail outlets already in existence. The retail agents can be issued with a POS device connected to the bank through a wireless satellite technology or a phone line. The customers can be given bank PIN card with biometric security features. The use of mobile phones by both the customer and the agent will greatly reduce the amount of infrastructure used. When a customer deposits money at a store by using a card issued by the bank, he automatically creates a direct communication channel with the bank. The bank then withdraws an equivalent amount from the agents account so as to fund the deposit and issues a receipt to the customer (Siedek & Mas , 2008).

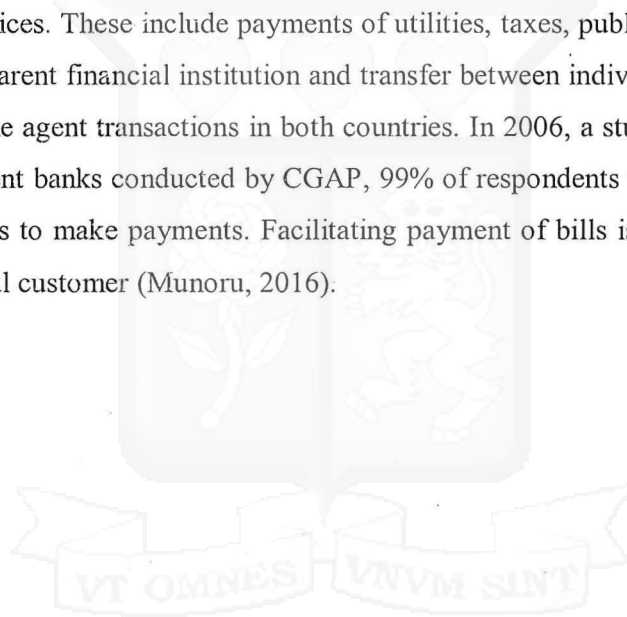
When a customer makes a withdrawal, the bank agent gives out cash from his till and an equivalent amount is sent to his account by the bank to compensate him. He is required to visit the bank at some time to balance the till and claim a commission against the number of transactions carried out. An agent network is truly an important technological play for any bank. It can be compared to MasterCard, Visa and debit card merchant but in this case the card payments at retail stores are for withdrawing and depositing cash and not just for the sale of goods. With the appropriate technology, the bank be in a position to trust the process in which customer transactions are carried out. The costs associated with service distribution can be greatly reduced, while still effectively controlling banking risks (Siedek & Mas , 2008).

Brazil has all its municipalities served by the formal financial sector as a result of rapid growth of banking agents. In Kenya and the Philippines, mobile operators rely on their prepaid card distribution networks to act as deposit and withdrawal points. Bolivia, Colombia, India, Mexico, Pakistan, Peru, and South Africa are also adopting this model (Siedek & Mas , 2008).

#### **2.2.4: Bill Payments**

In the traditional form of branch banking, a customer was required to pay his bills at the provider's branch. This posed a hindrance to those potential bank customers who lived far away from the provider. Agency banking through familiar outlets such as supermarkets and pharmacies seeks to overcome these perceived challenges by ensuring easy access of banking agencies to potential bank customers and thus increasing the payment of bills (Munoru, 2016).

According to (AFI, 2012), facilitation of payment of bills through agency banking is one of the most important and meaningful services that banking agents offer with respect to financial inclusion. The discussion paper further notes that in Brazil and Colombia, payments are the most commonly used services. These include payments of utilities, taxes, public fees, payment of bills and fees to agent's parent financial institution and transfer between individuals. These account to more than 75% of the agent transactions in both countries. In 2006, a study of low income users and non-users of agent banks conducted by CGAP, 99% of respondents who used agent banking reported using agents to make payments. Facilitating payment of bills is significant as it means creating a new formal customer (Munoru, 2016).



### 2.3: Conceptual Framework

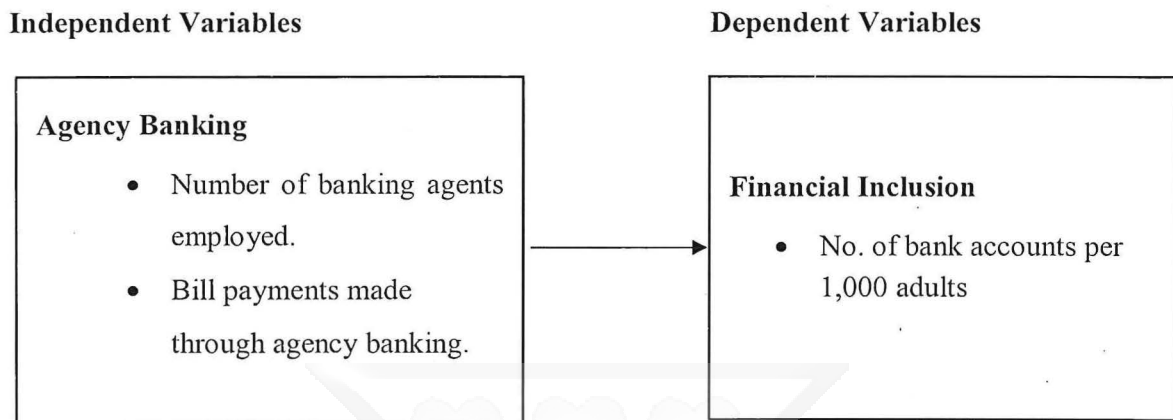


Figure 2.1: Conceptual Framework

Source: Researcher (2017)

### 2.4: Research Gap

According to (Mas, 2009), branchless banking as a means to financial inclusion consists of three key economic drivers: the retail network which is composed of retail outlets, the payment network which aggregates transactions from retail outlets to the issuer and the account platform which authorizes transactions and maintains the value of accounts. He further adds that these key drivers hold different economic logic which presents providers, in this case banks, with respective key tradeoffs that they need to face in order to establish the roles of the value chain. This enables banks to know the type of relationships that will achieve the likely scale while still delivering services to poor customers at an end-to-end transaction cost.

Previous studies show that developing countries such as Brazil and Colombia have made enormous strides in promoting financial inclusion through agency banking by employing bank agents, to facilitate financial inclusion through account opening and bill payments, in what is referred to as correspondent banking. In the Kenyan context, the role and extent to which the number of agents employed and bill payments have led to financial inclusion is not known for sure. This study therefore sets out to determine the impact of these factors in facilitating financial inclusion.

## **CHAPTER 3: METHODOLOGY**

### **3.1: Introduction**

This chapter presents the methodology that will be used to carry out the study. It is organized into: Research design, the population of the study, sampling techniques, data collection procedures and data analysis approach.

### **3.2: Research Design**

The study will adopt a descriptive design. The descriptive method of research enables a researcher to gather information about the present existing conditions and attach some meaning to how the world is (Creswell, 1994). The study will make use of inferential statistics where measures of the selected variables of acceptance will be taken once in a cross sectional study of the respondents without manipulating the study environment. In addition, the study will adopt a time series approach in an attempt to understand, describe and explain the role of agency banking on financial inclusion.

### **3.3: Population and Sample Size**

A population is the entire mass of observations, from which the sample is formed, that have specific characteristics. The sample observation is the specific situation applied to the general situation, the population (Singh, 2006). This study will consider all the 42 commercial banks in Kenya as at 31<sup>st</sup> December 2016. The sample size will be the 17 commercial banks that have so far embraced the agency banking model and whose agency banking transactions are filed with the CBK.

### **3.4: Data Collection**

All commercial banks are required by the CBK, the financial regulator, to file and publish their annual financial statements. Therefore, the study will make use of secondary data from reports compiled by the CBK for the period between 2011 and 2015. This period has been chosen because agency banking was first commissioned in 2010 and transactions began in 2011. According to the CBK guidelines on agent banking, all banks dealing with agency banking must provide the CBK with information on agency operations including nature, number, value and monthly geographical distribution of transactions under what is called the fourth schedule (Central Bank of Kenya, 2011).

### 3.5: Data Analysis

Data will be recorded using excel. Inferential statistics will be used to predict the covariance between the dependent and independent variables while correlation will be used to measure their degree of association. The regression model will be used to estimate the relationship between the dependent and independent variables.

The regression model will be analyzed using time series as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon$$

Where:

Y - Financial Inclusion (No. of bank accounts per 1,000 adults)

$\beta_0$  - The regression constant,

$\beta_1 - \beta_2$  - Regression coefficients indicating the various levels of importance.

$X_1$  - Number of agents employed.

$X_2$  - Bill payments

E - Error term

The above equation indicates financial inclusion by commercial banks expressed as a linear function of two independent variables and a random error of variables not represented in the selected two.

Tests will be carried out to ensure that the model complies with the following assumptions of a linear regression: homoscedasticity, multicollinearity and OLS.

## CHAPTER 4: DATA ANALYSIS, RESULTS AND INTERPRETATION

### 4.1: Introduction

This chapter presents the findings and analysis of the study as set out in the research methodology. The data was extracted from the Central Bank Reports, summarized, organized and presented using excel and interpreted using regression analysis, ordinary least squares method.

### 4.2: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
accounts	60	4.278	.3026258	3.91	4.7
agents	60	5.995287	.8810352	4.356709	6.933423
bills	60	9.39952	.731161	8.1934	10.25692

### 4.3: Data Characteristics

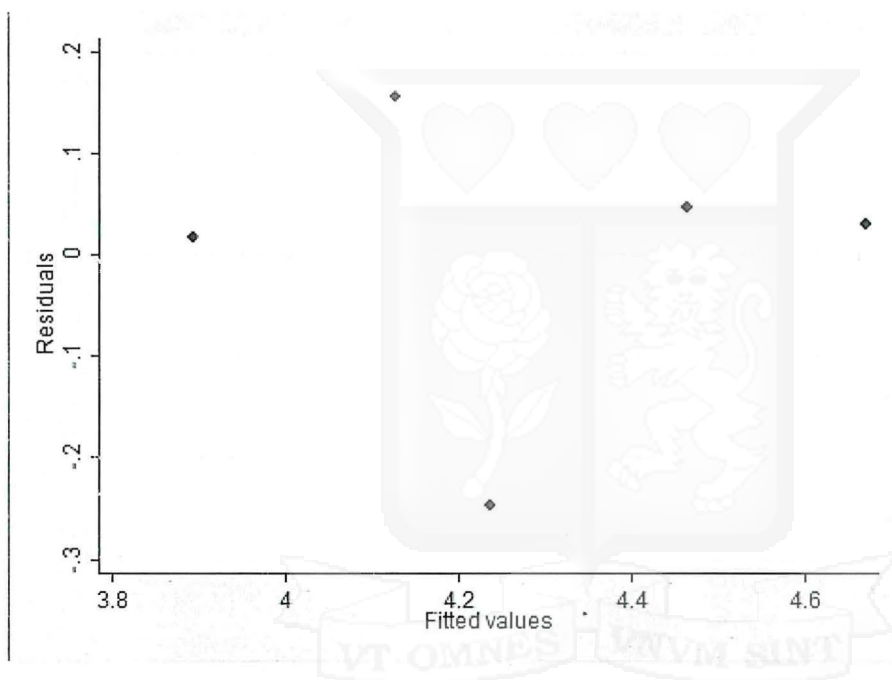
#### 4.3.1: Correlation Analysis

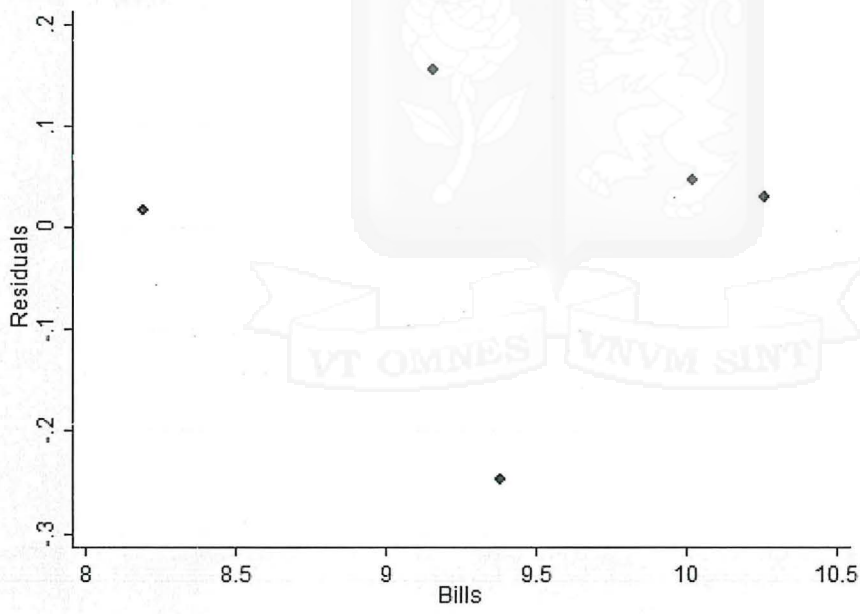
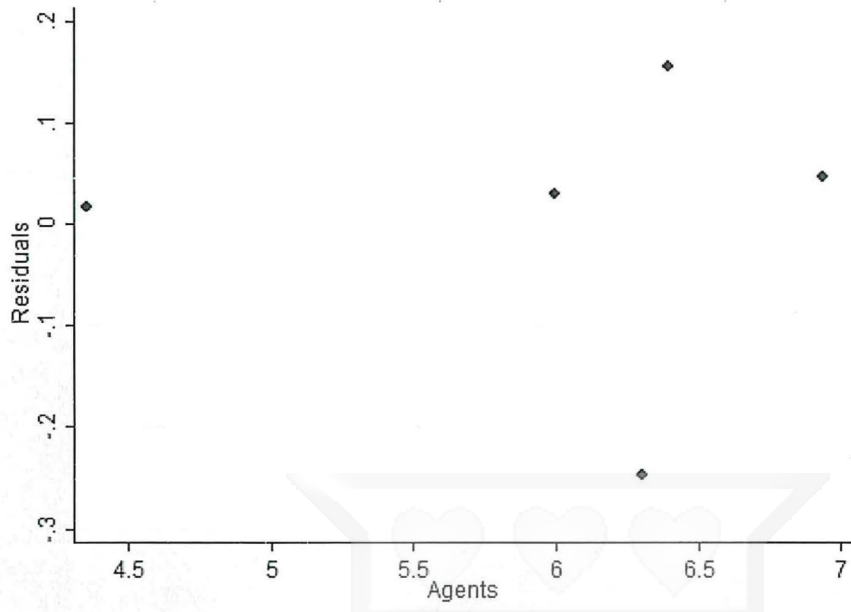
	accounts	agents	bills
accounts	1.0000		
agents	0.5571	1.0000	
bills	0.8766	0.7725	1.0000

I used the correlation matrix to determine the linear relationship between the variables and to establish the existence of multicollinearity between the independent variables. According to (Gujarati & Sangeetha, 2007) Multicollinearity is the existence of perfect or exact relationship among some or all explanatory variables. They further state that when the correlation between two variables is 0.9 and above there is evidence of high multicollinearity. From the above, all the correlations coefficients between the explanatory variables are less than 0.9 which is a clear indication of lack of absence of multicollinearity in the data series thus it is justified to use OLS regression.

#### 4.3.2: Homoscedasticity

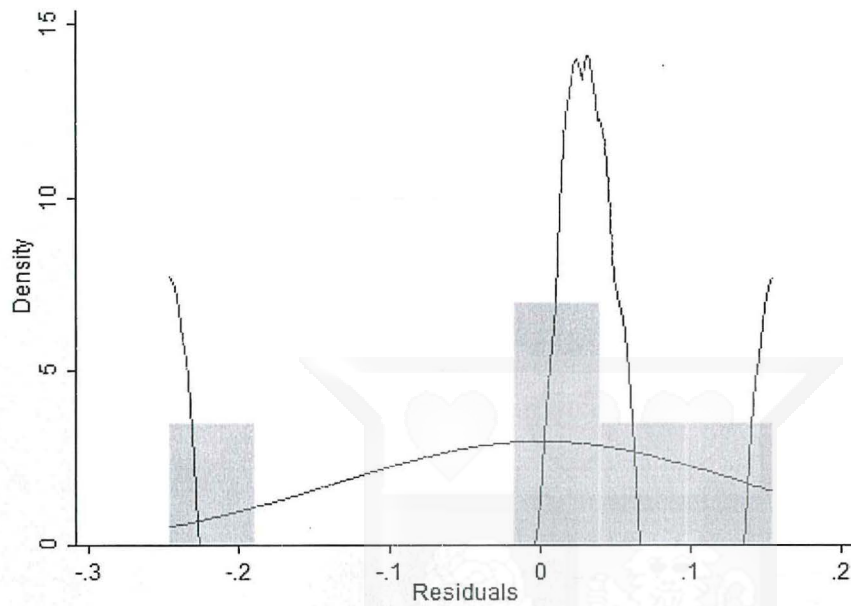
To test for homoscedasticity, I created residual plots to try and look out for trends. First I created a residual-versus-fitted plot which seemed to have a constant mean and constant variance thus suggesting that homoscedasticity was probably a reasonable assumption and therefore there was no need to increase the number of co-variates to try and improve the fit of my model. I also created residual-versus-predictor plots which did not show any major trends and thus it was safe to assume that the assumption of homoscedasticity and conditional normality had been met.





### 4.3.3: Normal distribution of standard errors

I created a histogram of residual which seemed normal but not exactly normal.



I therefore carried out a Jarque-Bera test which gave me the following results.

**Jarque-Bera normality test: 9.302 Chi (2) .0096**

**Jarque-Bera test for  $H_0$ : normality:**

From the results, we cannot reject the null hypothesis of normality which means that the data is normal.

#### 4.3.4: Augmented Dickey-Fuller test for unit root

I carried out the Augmented Dickey-Fuller test for unit root to test the stationarity of my variables.

##### Accounts variable

```
. dfuller accounts,lag(1)
```

```
Augmented Dickey-Fuller test for unit root      Number of obs   =      58
```

Test Statistic	Interpolated Dickey-Fuller			
	1% Critical Value	5% Critical Value	10% Critical Value	
Z(t)	-0.490	-3.569	-2.924	-2.597

```
MacKinnon approximate p-value for Z(t) = 0.8939
```

##### Agents variable

```
. dfuller agents,lag(1)
```

```
Augmented Dickey-Fuller test for unit root      Number of obs   =      58
```

Test Statistic	Interpolated Dickey-Fuller			
	1% Critical Value	5% Critical Value	10% Critical Value	
Z(t)	-2.048	-3.569	-2.924	-2.597

```
MacKinnon approximate p-value for Z(t) = 0.2657
```

##### Bills variable

```
. dfuller bills,lag(1)
```

```
Augmented Dickey-Fuller test for unit root      Number of obs   =      58
```

Test Statistic	Interpolated Dickey-Fuller			
	1% Critical Value	5% Critical Value	10% Critical Value	
Z(t)	-1.398	-3.569	-2.924	-2.597

```
MacKinnon approximate p-value for Z(t) = 0.5835
```

The hypothesis of the ADF test are as follows:

$H_0$ : There is unit root

$H_1$ : There is no unit root

The test statistics are higher than all the critical values so we accept null. Unit root exists and the data series is non stationary.

To convert the data series into stationary data, I had to test first difference series for stationarity for all the variables using time series line plots and the results were that the first difference series of all the variables was stationary. The results of the ADF tests were as follows:

### Accounts variable

```
. dfuller accountsdiff, lag(1)
Augmented Dickey-Fuller test for unit root      Number of obs   =      57
----- Interpolated Dickey-Fuller -----
              Test              1% Critical      5% Critical      10% Critical
              Statistic         Value           Value           Value
-----
Z(t)          -5.746            -3.570          -2.924          -2.597
-----
MacKinnon approximate p-value for Z(t) = 0.0000
```

### Agents variable

```
. dfuller agentsdiff, lag(1)
Augmented Dickey-Fuller test for unit root      Number of obs   =      57
----- Interpolated Dickey-Fuller -----
              Test              1% Critical      5% Critical      10% Critical
              Statistic         Value           Value           Value
-----
Z(t)          -5.271            -3.570          -2.924          -2.597
-----
MacKinnon approximate p-value for Z(t) = 0.0000
```

**Bills variable**

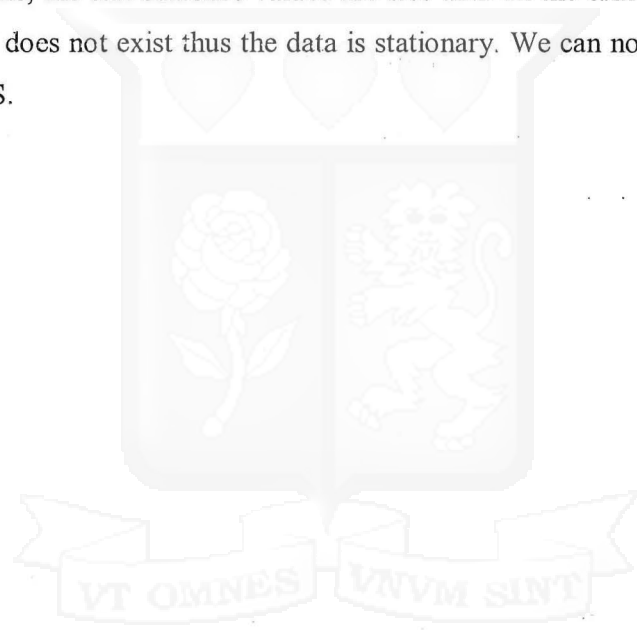
```
. dfuller billsdiff,lag(1)
```

Augmented Dickey-Fuller test for unit root                      Number of obs    =            57

Test Statistic	Interpolated Dickey-Fuller		
	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-3.570	-2.924	-2.597

MacKinnon approximate p-value for Z(t) = 0.0000

From the above results, the test statistics values are less than all the critical values therefore we reject null. Unit root does not exist thus the data is stationary. We can now run a multiple linear regression using OLS.



### 4.3.5: Regression Analysis

The regression analysis run on financial inclusion as the dependent variable and number of bank agents employed and bill payments as the independent variables yielded the following results.

Source	SS	df	MS			
Model	4.34588454	2	2.17294227	Number of obs =	60	
Residual	1.05747399	57	.018552175	F( 2, 57) =	117.13	
				Prob > F =	0.0000	
				R-squared =	0.8043	
				Adj R-squared =	0.7974	
Total	5.40335853	59	.091582348	Root MSE =	.13621	

accounts	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
agents	-.1023763	.0316977	-3.23	0.002	-.1658496	-.0389029
bills	.458136	.0381951	11.99	0.000	.3816517	.5346203
_cons	.5855171	.2447458	2.39	0.020	.0954221	1.075612

The fitted regression model can be written as:

$$Y = 0.5855171 - 0.1023763X_1 + 0.458136X_2 + \varepsilon$$

Where:  $\varepsilon \sim N(0, 0.13621^2)$

I interpreted the estimates of  $\beta_0$ ,  $\beta_1$  and  $\beta_2$  as follows: for every 1% increase in the number of bank agents employed, there is on average 0.1024% decrease in financial inclusion when I fix the number of bill payments. Similarly, for every 1% increase in the number of bill payments, there is on average 0.4581% increase in financial inclusion when I fix the number of bank agents employed.  $\beta_0$  is technically defined as the estimated expected value of the outcome when the co-variates are both set to zero and in this case it is at 0.5855.

#### 4.3.5: Hypothesis testing

Hypothesis  $H_01$ : The regression test results show t-statistic of -3.23 which is less than 2 thus indicating that the number of agents employed is not significant on financial analysis. Therefore, we do not reject the null hypothesis.

Hypothesis  $H_02$ : The regression test results show t-statistic of 11.89 which is greater than 2 and probability of 0.000 which is less than 5% thus indicating that bill payment has a high significance on financial inclusion. Therefore, we reject the null hypothesis.



## **CHAPTER 5: SUMMARY, CONCLUSION AND RECOMMENDATIONS**

### **5.1: Introduction**

This chapter draws the summary and conclusions from the stated findings in accordance with the research objectives.

### **5.2: Summary of findings**

Individuals and businesses are said to be financially included when they have access to useful and affordable financial products and services that meet their needs: transactions, payments, savings, credit and insurance, delivered in a responsible and sustainable way. Limited access to the formal financial sector is a common feature of the economic environment in many emerging markets and developing economies. The first step towards wider financial inclusion is having a transaction account as it enables one to save money, receive and make payments. Accountholders are more likely to use other financial services, such as insurance and credit, invest in health and education, to start and expand businesses, get through financial shocks and manage risks which can improve the overall quality of their lives.

From the findings, it is clear that there is a strong positive relationship between agency banking and financial inclusion. The correlation coefficient between financial inclusion and agency banking was 0.7974 which is enough to indicate the existence of a strong relationship between the independent variables and the dependent variable. The R-square (coefficient of determination) is 0.8043 which means that 80.43% of the variance in the financial inclusion variable can be explained and predicted by the agency banking variables. Therefore, the effect of agency banking on financial inclusion cannot be ignored and should be adopted by all the stakeholders as it is a measure of reducing poverty.

### **5.3: Conclusion**

The study concludes that because finance is meant to help us escape from a hand-to-mouth existence whereby low income earners who have their income accumulated in a certain period are able to meet their future financial needs like paying for school fees and medical insurance, proximity of financial institutions is key. Therefore, financial institutions through bank agents should provide the unbanked and under-banked population with affordable, accessible and quality financial services in order to facilitate financial inclusion.

### **5.4: Recommendations**

Commercial banks should train agents on how to conduct due diligence on potential customers so as to enable them to open new bank accounts and help the financially excluded to easily carry out financial transactions such as: cash deposits, cash withdrawals, account balance enquiries, payment of bills, transfer of funds and the government to pay retirement and social benefits. This will increase the number of financially included individuals and households and in turn lead to economic development, effective distribution of resources and the achievement of Vision 2030.

### **5.5: Recommendation for future research**

In the future, further research should be carried out on financial inclusion using more relevant, consistent, flexible and balanced measures such as the core set of indicators, access and usage, for countries which have little or no data to work with. For more developed countries with advanced data collection and measurement capabilities, additional indicators which are relevant to their national policies and context should be used so as to obtain a better snapshot of financial inclusion.

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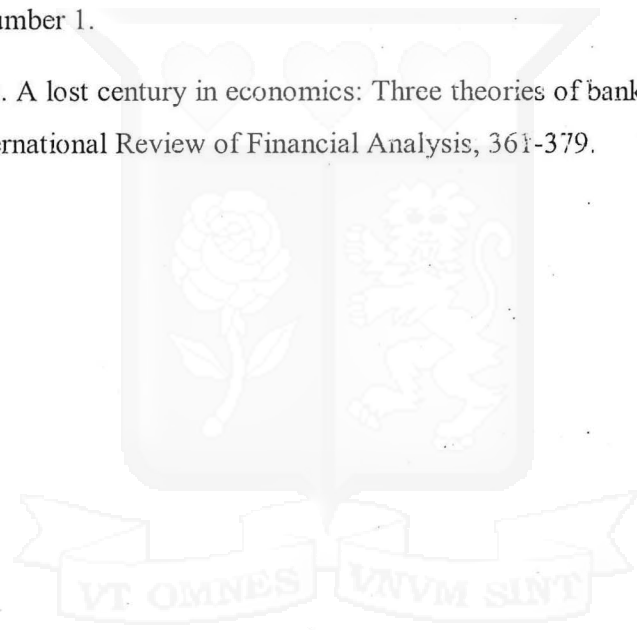
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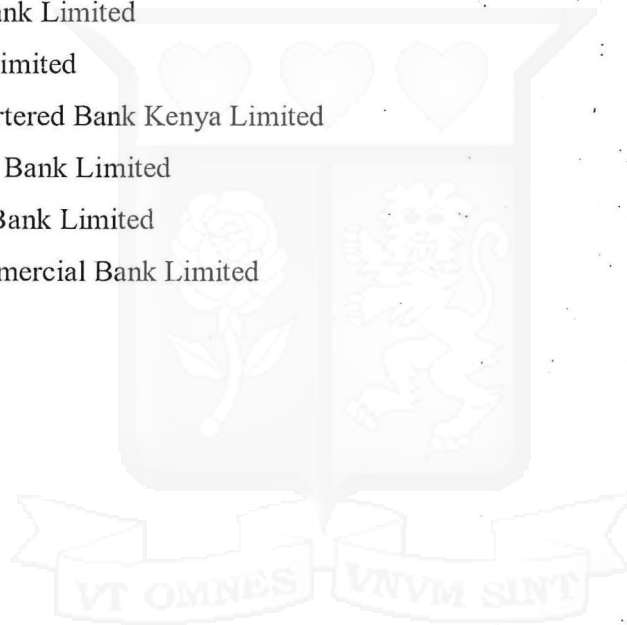
## Appendices

### Appendix I

#### List of Commercial Banks in Kenya

1. African Banking Corporation Limited
2. Bank of Africa Kenya Limited
3. Bank of Baroda (K) Limited
4. Bank of India
5. Barclays Bank of Kenya Limited
6. Stanbic Bank Kenya Limited
7. Charterhouse Bank Limited (under statutory management)
8. Chase Bank (K) Limited (in receivership)
9. Citibank N.A Limited
10. Commercial Bank of Africa Limited
11. Consolidated Bank of Kenya Limited
12. Co-operative Bank of Kenya Limited
13. Credit Bank Limited
14. Development Bank of Kenya Limited
15. Diamond Trust Bank Kenya Limited
16. Ecobank Kenya Limited
17. Spire Bank Limited
18. Equity Bank Limited
19. Family Bank Limited
20. Fidelity Commercial Bank Limited
21. Guaranty Trust Bank (K) Ltd
22. First Community Bank Limited
23. Giro Commercial Bank Limited
24. Guardian Bank Limited
25. Gulf African Bank Limited
26. Habib Bank A.G Zurich
27. Habib Bank Limited

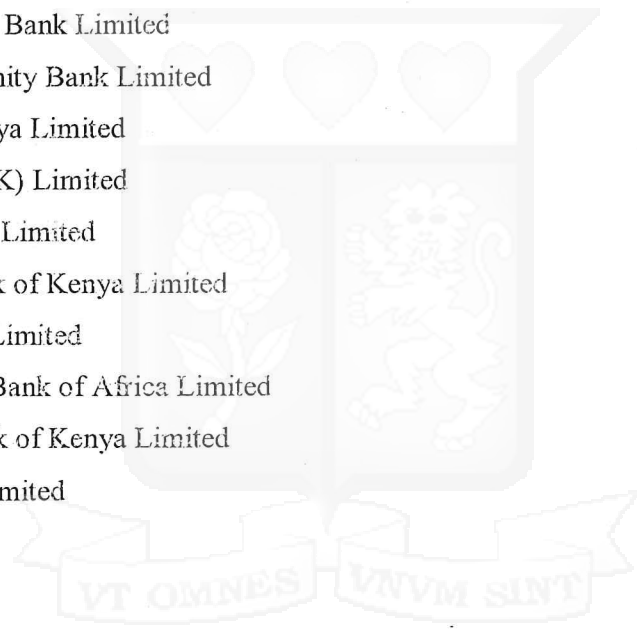
28. Imperial Bank Limited (in receivership)
29. I&M Bank Limited
30. Jamii Bora Bank Limited
31. KCB Bank Kenya Limited
32. Sidian Bank Limited
33. Middle East Bank (K) Limited
34. National Bank of Kenya Limited
35. NIC Bank limited
36. M-Oriental Commercial Bank Limited
37. Paramount Bank Limited
38. Prime Bank Limited
39. Standard Chartered Bank Kenya Limited
40. Transnational Bank Limited
41. UBA Kenya Bank Limited
42. Victoria Commercial Bank Limited



## Appendix II

### List of Commercial Banks that have adopted agency banking

1. Equity Bank limited
2. Kenya Commercial Bank Limited
3. Cooperative Bank Limited
4. Diamond Trust Bank Limited
5. NIC Bank
6. Consolidated Bank of Kenya Limited
7. Family Bank Limited
8. Transnational Bank Limited
9. First Community Bank Limited
10. Ecobank Kenya Limited
11. Chase Bank (K) Limited
12. Citibank N.A Limited
13. National Bank of Kenya Limited
14. Sidian Bank Limited
15. Commercial Bank of Africa Limited
16. Barclays Bank of Kenya Limited
17. I&M Bank Limited



## Appendix IV

### Agency Banking Data for Banks – Number of Transactions

Type of transactions	Number of Transactions Cumulative (2010-2015)
Cash Deposits	97,024,452
Cash Withdrawals	83,526,387
Payment of Bills	908,742
Payment of Retirement and Social Benefits	1,176,635
Transfer of Funds	21,214
Account balance enquiries	33,794,324
Mini statements requests	219,712
Collection of loan application forms	2
Collection of account opening forms	1,520,454
Collection of debit and credit card application forms	117,058
Collection of debit and credit cards	60,580
Total	218,370,211