

ADOPTION OF BITCOIN IN KENYA, A CASE STUDY OF BITPESA

MWANGI EDWIN NJUGUNA

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DECLARATION

STUDENT

I declare that this project is my original work and has never been submitted for a degree in any University or college for examination/academic purposes.

Signature:.....Date:.....

EDWIN NJUGUNA MWANGI

SUPERVISOR

This research project has been submitted for examination with my approval as the University Supervisor.

Signature:.....Date:.....

DR J.M. NJIHIA

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ABBREVIATIONS

AUD	Australian Dollar
CBK	Central Bank of Kenya
GDP	Gross Domestic Product
HTML5	Hyper Text Mark-up Language version 5
IMF	International Monetary Fund
KIPOCHI	www.kipochi.com
KSH	Kenya Shillings
M-PESA	A mobile money transfer service in Kenya.
OLX	www.olx.co.ke
PAYPAL	A peer to peer online payment system
SMS	Short Messages
UK	United Kingdom
USA	United States of America
USSD	Unstructured Supplementary Service
VAT	Value Added Tax

ABSTRACT

Bitcoin first appeared in January 2009, the creation of a computer programmer using the pseudonym Satoshi Nakamoto who invented an open source, peer to peer, digital currency. The Bitcoin system is private, but with no traditional financial institutions involved in transactions. Unlike earlier digital currencies that had some central controlling person or entity, the Bitcoin network is completely decentralized, with all parts of transactions performed by the users of the system. With a Bitcoin transaction there is no third party intermediary. The buyer and seller interact directly but their identities are encrypted and no personal information is transferred from one to the other. However, unlike a fully anonymous transaction, there is a transaction record stored in a global Bitcoin general ledger that is used to validate transactions. For this reason Bitcoin transactions are thought to be pseudonymous, not anonymous. Although the scale of Bitcoin use has increased substantially, it still remains small in comparison to traditional electronic payments systems such as credit cards and the use of dollars as a circulating currency. There are concerns about Bitcoin's use in illegal money transfers and concerns about the protection of consumers and investors who might use it which raises the issue of the regulation surrounding Bitcoin. Furthermore, there are also a number of disadvantages that could hinder wider use. These include sizable volatility of the price of Bitcoins, uncertain security from theft and fraud, and a long term deflationary bias that encourages the hoarding of Bitcoins. On the other hand Bitcoin offers users the advantages of lower transaction costs, increased privacy, and long term protection of loss of purchasing power from inflation. This research found out that Bitcoin is unregulated in Kenya with no regulation within the CBK Act outlining how it should be handled. Secondly, the research found that use of Bitcoin reduced the cost of international funds transfers and that users have challenges adopting the Bitcoin technology in understanding it and how it works.

CHAPTER ONE: INTRODUCTION

1.1. Background

Money supply is defined as the entire stock of currency and other liquid instruments in a country's economy at a particular time. Central banks often regulate this through monetary and fiscal policies set from time to time to shield citizens against unfavorable inflation. Electronic money on the other hand is an extension of a national currency for use on a digital channel to lower the cost of handling physical cash. It is estimated that the cost of handling physical cash exceeds one percent of the GDP. Electronic money issuers similarly are regulated by central banks by ensuring that e-money issued is also deposited with fully accredited financial institutions. Kenya serves as a worldwide model for the possibilities of mobile money with M-PESA being a case study to the possibilities to money. Other developing countries like Iran have followed suit leapfrogging from traditional bank accounts to doing banking on the mobile phone (Raskin, 2012).

As digitization has progressed, there has been an increased adoption of private digital currencies, digital in the sense that they have no physical manifestation. These are virtual currencies that have the characteristics of money. They offer a unit of measure, a medium of exchange and a store of value. Digital currencies are designed to operate without the need for intermediaries or any central issuing authority. Digital currencies do not rely on a central bank to issue it, a commercial bank to store it, or a credit card company to transfer it. Instead, users interact with each other directly and anonymously and without third-party intervention (Nakamoto, 2009).

These circumstances make digital currency a potential tool to use to overcome the limitations of developing countries as they represent a major paradigm shift in the concept of banking and access to global markets. Through technology leapfrogging, developing countries skipped building wired telephone infrastructure and went straight to mobile phones. Similarly, through digital currencies, online consumers are bypassing physical banks by use of peer to peer digital currencies (Grinberg, 2011).

1.1.1. Bitcoin as a Digital currency

Bitcoin first appeared in January of 2009 and was the invention of a computer programmer using the pseudonym Satoshi Nakamoto. The Bitcoin system was developed with three distinctive features. Firstly, the system is open source meaning that its controlling computer code is open to public view. Secondly, Bitcoin digital currency is a peer to peer currency and therefore transactions do not require a third-party to validate instead they are validated by the Bitcoin community ensuring high levels of security. Lastly, Bitcoin is a decentralized currency not controlled by any single organization or government (Nakamoto, 2009).

Elwell (2013) described Bitcoin as two things; Firstly, Bitcoin as a digital currency which means that the unit of account used has no physical manifestation with a legal tender status. Secondly, he described Bitcoin as private money meaning that it is a currency that is supplied by a private organization to counter governments' monopolies of currency issuance (Elwell, 2013).

Although the scale of Bitcoin use has increased substantially, it still remains small in comparison to traditional electronic payments systems such as credit cards and the use of dollars as a circulating currency. Some of the limitations in its adoption results from lack of a clear understanding of what Bitcoin and how it works. Secondly, there are security risks with companies that trade Bitcoins recording huge losses when they were hacked and their Bitcoins stolen. Thirdly, the legal framework that Bitcoin operates in is not clear since it is not regulated by any government (West, 2014).

1.1.2. Digital Money Services in Kenya

The first digital money service in Kenya is Bitpesa which is a digital payment service that enables anyone in the Diaspora to send money to people residing in Kenya. Bitpesa converts Bitcoins to Kenya shillings and forwards the money via a mobile money service to the recipients in Kenya (SmartKenya, 2014). Another similar digital payment service is Kipochi which is basically a Bitcoin wallet with MPESA mobile money integration. Kipochi works on all mobile phones, having SMS, USSD and HTML5 frontends, as well

as on desktop computers giving its users a variety of options to carry out Bitcoin transactions (Braendgaard, 2013).

Kenya is home to mobile money transfer invention with the success of M-PESA being a case study for the rest of world. M-PESA thrived on the underdevelopment of traditional banking infrastructure to grow. Similarly, Bitcoin stands a chance to thrive in Kenya with majority of Kenyans turning to the online market to buy and sell goods and services as witnessed with the growth of e-commerce websites like OLX (Greeley, 2014).

1.2. Research Problem

The proposed research is exploratory in nature since Bitcoin is a fairly new concept in the Kenyan market. However, significant scholarship has been devoted to the workings of Bitcoin and the following section reviews empirical studies relevant to the proposed research.

Elwell (2013) noted that Bitcoin transactions have no third party intermediary to validate since this is done by a peer to peer Bitcoin community. He concluded that because of this reason, Bitcoin transactions are purported to be less expensive for users as compared to other traditional payment systems. Credit card companies for instance will charge merchant significant fees for their role as a trusted third party intermediary to validate electronic transactions. In addition, Elwell (2013) noted that Bitcoin sales are non-reversible which eliminates the possibility of consumer charge backs, which merchants find costly (Elwell, 2013). However, while there is considerable subjective evidence that Bitcoin actually reduces the cost of international funds transfer, there exists no comprehensive data on the size of the Bitcoin's cost advantage. This research proposes to bridge this gap and find the exact cost benefit that the use of Bitcoins brings to Kenyans who use Bitcoin to receive or send money in and out of the country respectively.

West (2013) found out that literacy is often a hidden hurdle to bringing financial inclusion to the unbanked. West (2013) argued that systems that should work in theory break down when poor people are unable to learn how to use them or are unable to assume the accountability of consumers who know their rights and how to obtain recourse to maintain transparency and honesty in the system. He also observed that one

needs to be able to read and understand when money is sent to them so that they are confident that the correct amount was sent (West, 2014). This means therefore that, Bitcoin usage is limited to a certain group of people who can understand what it is and be able to use it. This forms a challenge in the adoption of Bitcoin and relevant guidance is required to help people tap into the benefits of using Bitcoin. However, Kenyans in the rural setting where illiteracy levels are high have adopted mobile money services like M-PESA. This means that there is need to explore if there are other challenges in the adoption of digital currencies beyond illiteracy in Kenya.

Regarding the regulation of Bitcoin, Plassaras (2013) found out that although only four years old at the time, Bitcoin's ability to serve as regulation-free virtual cash posed a number of difficult legal questions because of its transnational and largely decentralized nature. While it was yet to gain the widespread acceptance enjoyed by other major international currencies, Bitcoin continued to grow in popularity making regulatory solutions for the challenges it presented necessary. In his research, he noted that though some scholarship had been devoted to domestic regulation of Bitcoin transactions, virtually no attention had been given to regulating Bitcoin at the international level. His argument was that the International Monetary Fund (IMF) which is the international institution tasked with coordinating the international foreign currency exchange should lead the regulation of this new currency ensuring that all member countries played by the same rules. It is therefore of paramount importance for the proposed research to find out what regulatory framework that regulates digital currencies in Kenya and how the said framework complied with international standards if any.

Bitcoin is a disruptive technology in the digital and online payments space in Kenya. Such technologies always happen without proper regulation and governments have been known to play catch up in the regulation of such technologies (Elwell, 2013). Therefore, the use of Bitcoin in Kenya to conduct foreign currency exchanges raises questions whether these exchanges are regulated by the Central bank of Kenya and if not what can be done to protect the parties involved. Furthermore, does the use of Bitcoin reduce the cost of international funds transfer and what are some of the challenges faced by Kenyans in the adoption of Bitcoin as a digital currency?

1.3. Research Objectives

The research paper aims at finding out the impact of digital currencies on e-commerce landscape in Kenya. In detail, the following objectives will be achieved by the proposed research;

- i. To determine whether the use of Bitcoins can reduce the cost of international funds transfers.
- ii. To establish the challenges encountered in the adoption of Bitcoin as a digital currencies in Kenya.
- iii. To determine the adequacy of the existing legal framework for regulating Bitcoin in Kenya.

1.4. Value of the Study

The use of digital currencies is a new concept globally with the first widely used Bitcoin having been in operation for five years at the time of this research. The proposed research seeks to build the building blocks to more research in this field which will be used as a reference by other researchers to build on it. Secondly, this research will inform on the legal framework on the use of Bitcoin and recommend on how the Kenyan government could regulate the use digital currencies in Kenya. Thirdly, the proposed research is also a learning opportunity to the researcher and presents a pioneering platform in the research of use of digital currencies in Kenya. Lastly, the research will inform the Kenyan online shoppers and the e-retailers on the potential benefits of the Bitcoin digital currencies and warn them of any potential challenges so they are more confident to adopt it.

CHAPTER TWO: LITERATURE REVIEW

This chapter presents the results of a detailed literature review on digital currencies, the factors affecting the adoption of Bitcoin as a digital currency and a review of the applicable theories relevant to this study. An appreciation of previous work relevant to this study is beneficial also in providing direction in the construction of data collection instruments and the analysis to be done on the data collected.

2.1.Digital Currencies

Digital currency is an extension of a national currency for use on a digital channel to lower the cost of handling physical cash. Raskin (2012) found that the cost of handling physical cash exceeds one percent of the GDP. Electronic money issuers similarly are regulated by central banks by ensuring that e-money issued is also deposited with fully accredited financial institutions (Raskin, 2012).

The theoretical roots of Bitcoin can be found in the Austrian school of economics and its criticism of the current fiat money system and interventions undertaken by governments and other agencies, which, in their view, result in aggravated business cycles and massive inflation. One of the foremost names in this field is Hayek (2013) who noted in his paper, *Denationalisation of Money*, that government should not have a monopoly over the issuance of money. He instead suggested that private banks should be allowed to issue non-interest-bearing certificates based on their own registered trademarks. Hayek argued that these certificates or currencies should be open to competition and would be traded at variable exchange rates. His conclusion was that currencies able to guarantee a stable purchasing power would eliminate other less stable currencies from the market and the result of this process of competition and profit maximization would be a highly efficient monetary system where only stable currencies would coexist (Hayek, 2013).

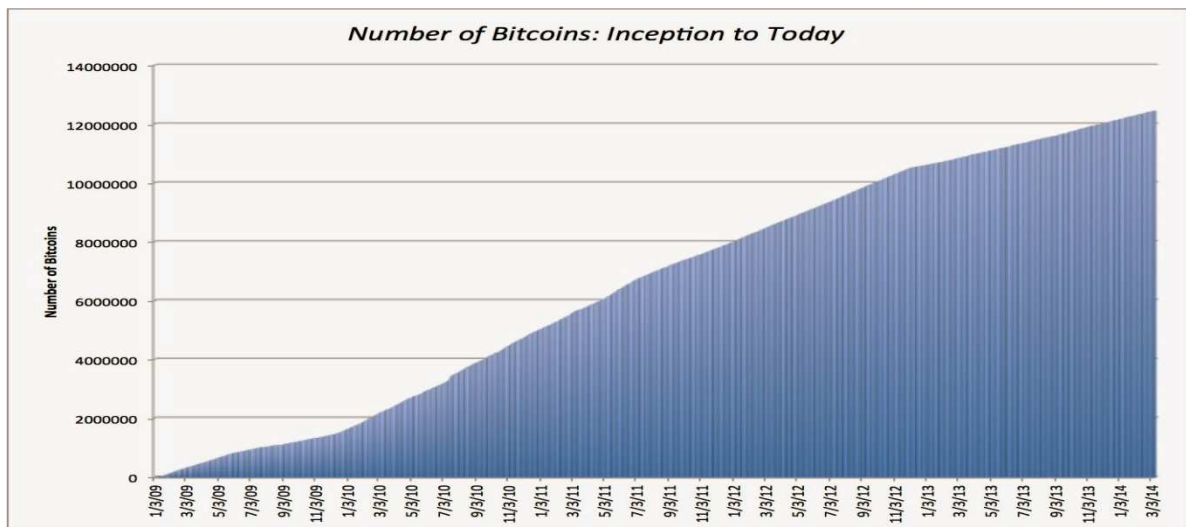
2.2.Bitcoin as a Digital Currency

Theoretically, Bitcoin is two things at once. Primarily, Bitcoin is a digital currency, meaning that the unit of account it employs has no physical manifestation with legal

tender status. Secondly, Bitcoin is what (Hayek, 2013) described as a “private currency”; a currency provided by private enterprise aimed at combating government monopolies on the supply of money. Conventional financial actors, such as central banks or government institutions, are not involved with Bitcoin transactions according to Hayek. In supporting the case of Bitcoin, Hayek argued that traditional currencies like the USD are prone to a number of weaknesses, especially vulnerability to inflation and political corruption. According to Hayek, Bitcoins are more stable than traditional currencies since they are not prone to these weaknesses. Bitcoin relies on its users from its supply to the means in which it is generated and validated online.

The creation of Bitcoin in 2009 was inspired by a vision to create a currency that was untraceable where users could transact more efficiently when provided with a peer to peer medium of exchange and a secure method of enforcing contracts (Nakamoto, 2009). This resulted in creation of Bitcoin which have no central issuing authority and no traditional financial institutions are involved in Bitcoin transactions. He also developed open source software which allows users to view the code and understand how it works. Bitcoin is not pegged on any real-world currency and its value is determined by supply and demand as shown of the graph below.

Figure 1: Number of Bitcoin in usage since inception of Bitcoin in 2009. Source, (Damodaran, 2014)



From the graph above, there were approximately 12 million Bitcoins at the beginning of 2014. The number of Bitcoins is finite and is capped at 21 million which is estimated to be reached by the year 2040. Bitcoin's software slows the generation of Bitcoins over time so that there will never be more than 21 million in circulation (Damodaran, 2014).

There are three ways for users to obtain Bitcoins according to Elwell (2013). Firstly, users can purchase Bitcoins by exchanging a currency such as the USD, for Bitcoin files. Secondly, users can obtain Bitcoins in exchange for goods or services, as is true for a traditional currency. Lastly, Bitcoin can be obtained through a process called mining where users are able to generate Bitcoins by using their computer's processing power to solve a complicated computer algorithm (Elwell, 2013).

2.3. Cost of Bitcoin transactions

According to Elwell (2013), one of the benefits that users derive from the use of Bitcoin is lower transaction costs. He argued that because there is no third-party intermediary, Bitcoin transactions are alleged to be relatively cheaper for users than those using conventional payments systems and traditional credit cards, which charge merchants significant fees for their role as trusted third party intermediary to authenticate electronic transactions. Additionally, Bitcoin sales are non-reversible, which removes the possibility for misuse of consumer charge-backs enabling merchants pass some of these savings on to the customer resulting to a low funds transfer cost of Bitcoin transactions (Elwell, 2013).

2.4. Challenges in the Adoption of Bitcoin

The first challenge is user privacy which Nakamoto (2009), the inventor of Bitcoin envisioned for users who seek autonomy while using Bitcoins for their commercial and financial transactions (Nakamoto, 2009). The challenge as Bortner (1996) noted is that such anonymity might be exploited by potential money launderers who might use Bitcoin for illegal financial activities (Bortner, 1996). According to Androulaki (2013), the Bitcoin system has tried to seal this loophole by ensuring that although there exists a degree of anonymity in Bitcoin transactions, there is a permanent and complete historical

record of Bitcoin amounts and encrypted identities for all transactions on the Bitcoin system that is potentially traceable (Androulaki, 2013).

Secondly, Bitcoin currency is linked to a complex computer program that many do not understand and that operates without accountability to any controlling entity and is not backed by any government. Elwell (2013) argued that this could be an unattractive vehicle for holding wealth for many people as contrasted to the widespread use of the US dollar which encourages its continued use and is an impediment to the use of other currencies, including Bitcoin. However (Mayer, 2013) on the other hand argued that Bitcoin is an option for something you can hold instead of dollars, at least for a time and does not threaten the use of the US dollars.

Thirdly, Bitcoin's price has been volatile since its creation in 2009, subject to sharp appreciations and steep depreciations in value because of speculative users who hoard Bitcoins expecting a rise in the price of Bitcoin (Graf, 2013). He observed that because the supply is capped in the long run, widespread use of Bitcoin would mean that the demand for Bitcoin would likely outstrip supply, causing Bitcoin's price to steadily increase. The consequence of that increase is that the Bitcoin price of goods and services would steadily fall causing deflation. He concluded that faced with deflation, there was a strong incentive for users to hoard Bitcoins and not spend them, causing the current level of transactions to fall (Graf, 2013).

The other factor that hinders the use of Bitcoin is its security. Elwell (2013) noted that while counterfeiting is purportedly not possible, Bitcoin exchanges and wallet services have at times struggled with security. Although cash and traditional electronic payment systems having periodic security problems, a high incidence of security problems on a system trying to establish itself and gain customer confidence could be more damaging. For instance, he noted that a Bitcoin bank operated from Australia but stored on servers in the USA, was hacked between 23 to 26 October, 2013. This resulted to the loss of 4,100 Bitcoins worth over 1 million AUD (Elwell, 2013).

Lastly, according to West (2014) literacy is often a hidden hurdle to bringing financial inclusion to the unbanked. Systems that should work in theory break down when poor

people are unable to learn how to use them or are unable to assume the accountability of consumers who know their rights and how to obtain recourse to maintain transparency and honesty in the system. West argues that one needs to be able to read and understand when money is sent to them so that they are confident that the correct amount was sent (West, 2014).

2.5. Legal framework for Bitcoin

The lack of an underlying legal framework poses additional problems to the use of Bitcoin as a currency. Such absence of regulation or public oversight, subjects Bitcoin to credit, liquidity, and operational risks, as well as risk of fraud. Furthermore, the lack of oversight coupled with the finality and irrevocability of Bitcoin transactions gives many skeptics cause for concern. Plassaras (2013) argued that because digital currency transactions necessarily occur over the Internet, cyber-security is a constant concern. Despite the technical measures used to secure individual Bitcoin transactions, user-end storage and usage of Bitcoins are key security vulnerability. For instance, in June 2011, a hacker compromised a user account containing about 400,000 Bitcoins, totaling approximately \$9 million, causing the value of one Bitcoin to plummet from \$17.50 to \$0.01 in only a few hours (Plassaras, 2013).

2.6. Theoretical perspectives on the use of Bitcoin

The study proposes to use the Diffusion of innovations theory which seeks to explain how, why, and at what rate new ideas and technology spread through cultures based on various levels of adopters categorized into innovators, early adopters, early majority, late majority, and laggards. Diffusion of technology manifests itself in different ways in various cultures and fields and is highly subject to the type of adopters and innovation-decision process.

Bitcoin emerged in 2009; an invention of Nakamoto (2009) who was inspired by the idea of creating a currency that is not regulated by any government or financial institution where users can enforce rules via a peer to peer community setup. The lack of clear regulation however exposes users to potential risks and there is need to find ways to regulate the use of digital currencies. There are two main reasons where users prefer

Bitcoin. Firstly, Bitcoin offers more privacy compared to other traditional payment system. Secondly, Bitcoin cautions users against inflation as it has steady supply. On the other hand, the complexity of Bitcoin, its price volatility and security breaches act to deter the widespread adoption of Bitcoin. The adoption of Bitcoin can best be described by the Diffusion of technology theory which seeks to explain how, why, and at what rate new ideas and technology spread through cultures based on various levels of adopters categorized into innovators, early adopters, early majority, late majority, and laggards.

2.7. Summary of Literature Review

This literature review has looked at the origin of Bitcoin, how (Nakamoto, 2009) the inventor of Bitcoin was inspired to create an open source peer to peer digital currency platform where users can transact with some degree of privacy and at the same time being in charge of ensuring that rules are adhered to. Secondly, the literature review brought out the factors that influence the wide usage of Bitcoin. These are user privacy and the idea that users are shielded from inflation. On the other hand, the literature review also brought out the issues that affect the widespread adoption of Bitcoin namely complexity of the Bitcoin system, price volatility, security and literacy.

Finally, the literature review looked into the regulatory framework of the Bitcoin system and identified that there lacks proper regulation of the Bitcoin usage globally. There is however need for regulation to protect online consumers and Bitcoin users from exploitation by malicious hackers. Therefore, the use of Bitcoin in Kenya to conduct foreign currency exchanges raises questions whether these exchanges are regulated by the Central bank of Kenya and if not what can be done to protect the parties involved. Furthermore, does the use of Bitcoin reduce the cost of international funds transfer? There is a need to find out whether use of Bitcoin in Kenya does actually reduce the cost of international money transfers in Kenya. Lastly, there is need to find out what challenges that users are encountering in the use of Bitcoin system in Kenya?

All the research works that have been cited above have been conducted outside Kenya which means there is an opportunity to replicate same studies in Kenya. The proposal

research seeks to find the impact of the use Bitcoin on international funds transfer, the challenges that users have in the use of Bitcoin system and finally the legal regulatory framework that regulates the use of Bitcoin usage in Kenya.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1. Introduction

This study aimed at evaluating the impact of digital currencies in Kenya with a particular interest in the use of Bitcoin currency, hence considered the impact on the cost of international funds transfer, factors affecting the adoption of Bitcoin and the legal framework that regulates Bitcoin in Kenya. This chapter therefore describes the data to be studied, case study selection, and the data collection and analysis methods to be employed.

3.2. Research Design

Descriptive research was used on a case study to describe and understand the impact of Bitcoin on e-commerce in Kenya. The study used a case study of Bitpesa; a digital money service in Kenya which enables users in Kenya to receive money sent from the UK. Bitpesa was a source of quantitative data as regards to the cost of money transfers which was used to show the impact of use of digital currencies on the cost of international money transfers. Secondly, qualitative data about the challenges that users have encountered in the adoption of the Bitcoin system was collected using a questionnaire guide.

3.3. Case study selection

Bitpesa is an organization based in Nairobi, Kenya which operates in the money transfer market with a unique methodology of using Bitcoin in order to reduce the cost of international money transfer. In this regard, Bitpesa's primary focus is on the Kenyan remittances from the UK with a view to grow across East Africa next and the African continent at large. According to Bitpesa website, the company's core emphasis with the Bitcoin service is to reduce the cost of money transfers to Kenya, increase the speed of money transfers and make it as convenient as possible for users to transfer money to Kenya. Bitpesa targets to reach the Kenyan community within the UK to understand their unique needs and tailor their products to meet those needs. Their choice of Kenya as their

sub-Saharan headquarters was guided by her central location and her innovation culture as seen in the mobile money front (SmartKenya, 2014). The company has five employees most of which are in senior management. Bitpesa was used to collect quantitative data as regards to the cost of money transfers which would show the impact of use of Bitcoin on the cost of international money transfers. Secondly, the challenges that are faced by Bitpesa customers provided data to study the factors that influence the adoption of Bitcoin currency in Kenya. Lastly, the legal framework that governs Bitpesa's operation was evaluated to understand the regulations behind the use of digital currencies in Kenya.

3.4.Data Collection methods

The information about the cost of international funds transfer services in Kenya was collected using secondary methods of data collection as this information was publicly available on company publications, press releases and company websites.

Primary data was collected through in-depth interviews which were organized with the employees of Bitpesa. The company had five employees at the time of conducting the research. The response rate was positive though Bitpesa being an international company, most of the senior management targeted as respondents were out of the country and only the Chief Executive Officer was available at the time of the data collection. Elizabeth Rossiello, the CEO of Bitpesa was interviewed and because of her being part of the senior management, she gave more insights which might not have been captured using a structured questionnaire. The questionnaire guide sought to establish the challenges that Bitpesa users normally faced while using the Bitpesa system.

3.5.Data analysis

The analysis was done using a combination of several methods. Quantitative analysis was used on quantitative data; data pertaining to the cost of international money transfers using Bitcoin in Kenya. Comparative analysis was done to determine how the cost of Bitcoin transactions compared with Western Union and PayPal.

Content analysis was conducted on the qualitative data; the challenges that users face in the adoption of Bitcoin as a currency in Kenya and also data relating to the legal framework that regulates the use of digital currencies in Kenya.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1.Introduction

This chapter describes the analysis of data followed by a discussion of the research findings. The findings relate to the research questions that guided the study. The data collected was analyzed to identify, describe and explore the impact of digital currencies on the cost of international funds transfers.

4.2.Impact of use of Bitcoin on International funds transfers

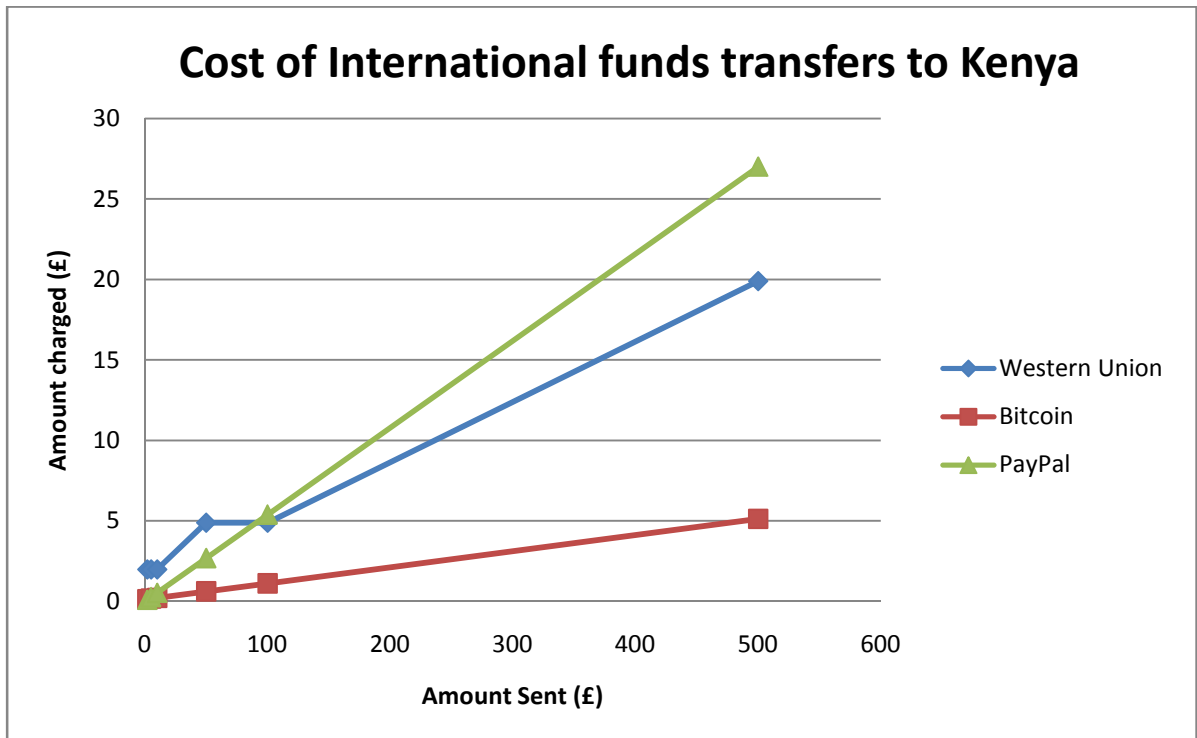
BitPesa is one of Africa's first Bitcoin startup that is making efficient and faster international remittances from the UK to Kenya possible. The research found that this is the company's strongest selling point for Kenyans living abroad, who often encounter situations where they wish to quickly send home small sums. Secondary data was used to compare the cost of sending amounts from as low as 2 pounds to 500 pounds using Western Union, Bitcoin and Paypal.

PayPal is an American international e-commerce business allowing payments and money transfers to be made through the Internet. Online money transfers serve as electronic alternatives to paying with traditional paper methods, such as checks and money orders. PayPal is used for international money transfers across borders and across different currencies for which it charges a fee which is pegged on amount and the currencies being exchanged. On the other hand, Western Union is a financial services and communications company based in the United States having several divisions, with products such as person-to-person money transfer, money orders, business payments and commercial services. Both Paypal and Western Union have been used for international funds transfer before Bitcoin entered this market and tried to compete on account of lower transactional fees for funds remittances.

The choice of Paypal and Western Union was guided by the fact that these two companies form the Bitcoin competition in the international money transfer market. A

cost of transfer analysis would therefore bring out the fee differences between Bitcoin and its conventional competitors as shown on the graph below;

Figure 2 Analysis of cost of international funds transfer of 500 pounds using Western Union, Bitcoin and PayPal.



According to the analysis, the cost of sending 500 pounds from the UK to Kenya using Paypal was highest at 27 pounds. This was 5.4% of the amount of money sent. Western Union came second with the cost of sending 500 pounds being 19.9 pounds which constituted 3.98% of the amount sent. Bitcoin was the cheapest at sending 500 pounds at 5.4 pounds which was about 1% of the amount sent. As per this findings therefore, it is cheaper to remit funds from the UK to Kenya using Bitcoin platform as opposed to Western Union and Paypal. The cost of sending small amounts less than 5 pounds is highest while using Western Union but becomes cheaper than Paypal when sending amounts higher than 100 pounds. The cost of sending money using Paypal is a straight gradient because Paypal charges a fixed amount of 5.4% of the amount sent when sending money outside the UK to countries outside of Europe.

This comparison revealed that significant savings are particularly pronounced for small transactions when using Bitpesa. These micro remittances in the range of 2 to 10 pounds are impractical via established money transfer companies like Western Union and PayPal since the cost of sending such equals the amount being sent in some cases.

4.3. The Challenges Faced in the Adoption of Bitcoin in Kenya

The research found out that Bitpesa being a Bitcoin oriented company faces unique challenges as a result of their business model. The major challenge is in educating their clientele on the power of Bitcoin and enabling them to understand the process of how it works. The complexity of Bitcoin starts from understanding what Bitcoin is as a crypto currency to how it is bought and sent to a recipient in another country. Additionally, Bitpesa conducted various focus groups organized and held in London and surrounding areas, as part of their awareness creation to Kenyans living in the United Kingdom. From these meetings, it was noted that clients experienced difficulty in accessing Bitcoin (SmartKenya, 2014). In UK, Bitcoin can be bought at local Bitcoin exchanges which include *BitStamp* which is a traditional exchange and *LocalBitcoins* which is a way of getting Bitcoin from individuals in the locality (BitPesa, 2013). Thirdly, the extreme volatility of Bitcoin is a second potential drawback to users who purchase Bitcoin. The disadvantage is that senders might find that the value of their Bitcoin changes drastically in a matter of days or hours which lowers the purchasing power and leads to losses.

4.4. Legal Framework for Regulating Bitcoin in Kenya

Bitpesa is a company that operates between the UK and Kenya. Since it is incorporated in the UK, this means it is obliged to comply with UK law that regulates digital currencies. The research found out that there has been no official statement published on the Bank of England's website regarding its position towards Bitcoin. The government of the United Kingdom has stated that the Bitcoin is currently unregulated. A high-level review of Bitcoin use in the UK took place in the summer of 2013, at which time concerns were raised as to the lack of transparency with the use of the digital currency, but it was left unregulated. While Bitcoin is not regulated, the research found out that the UK Revenue

and Customs has classified Bitcoin as “single purpose vouchers,” rendering any sales of them liable to a value-added tax of between 10 to 20 percent. When Bitcoin is exchanged for Sterling or for foreign currencies, such as Euros or Dollars, no value added tax is due on the value of the Bitcoin themselves. However, in all instances, VAT will be due in the normal way from suppliers of any goods or services sold in exchange for Bitcoin or other similar digital currencies. Profits and losses on all crypto currencies including Bitcoin are subject to capital gains tax.

The Central Bank of Kenya Act Section 4 (1) stipulates that the Central Bank of Kenya is the sole institution in Kenya that has full discretion and sole rights to issue currency notes and coins in Kenya. This responsibility encompasses planning, forecasting, procuring and distributing currency notes and coins. CBK is also mandated to set up suitable currency distribution mechanisms and conserving the integrity of Kenyan currency as a medium of exchange. Further subject to section 22 (1) of the Central Bank of Kenya Act only notes and coins issued by the CBK shall be considered legal tender within Kenya. This context seems to focus on the physical element of the paper money and coins. However, Bitcoin is a digital currency with no physical manifestation which exists as a series of encrypted numbers online and can be transferred over the internet. Despite this, Bitcoin fulfills all the other criteria of currency which means that it can be used in its encrypted form to pay for goods and services; it’s a medium of exchange and a store of value as well. This research found out that there is no law under the CBK Act that regulates use of digital currencies in Kenya.

4.5. Discussion of Findings

The research showed that BitPesa appears poised to disrupt the international remittance market by offering competitive fees, by enabling micro remittances, and by offering users a convenient way of sending money. This comparison revealed that significant savings are particularly pronounced for small transactions when using Bitpesa. These micro remittances in the range of 2 to 10 pounds are impractical via established money transfer companies like Western Union and PayPal since the cost of sending such equals the amount being sent in some cases. Earlier research on this area by Elwell (2013) pointed out on the reduction on the cost of international funds transfer but failed to bring out the comparison with other international money transfer services.

Secondly, the research established that the biggest challenge facing the Bitcoin currency adoption is on the side of the users who have challenges understanding the concept of Bitcoin and how it can significantly reduce the cost of sending funds internationally. West (2014) had found out that illiteracy was the biggest hurdle facing financial inclusion of the unbanked. Thirdly, the volatility of Bitcoin will continue to be a challenge so long as value of Bitcoin is pegged on the demand of Bitcoin. This creates a loophole where speculators can hoard Bitcoin to push the prices up. Security breaches on the Bitcoin system has in the past also contributed to the fall in value of Bitcoin as noted by Elwell (2013).

On the other hand, the Central Bank also has the authority to govern the exchange of currency. Bitcoin qualifies as a soft currency with no reserves to back it up and is therefore vulnerable to fluctuations in value. Bitcoin platforms are also potentially vulnerable to hacking. The Central Bank of Kenya Act is not equipped to demarcate the two or to regulate and respond to the launch of these complimentary currencies. The Central Bank of Kenya Act should be amended to include regulatory guidelines for complimentary currencies and crypto-currencies. Despite digital currencies being volatile, difficult to trace and easy to trade, and considering the fact that Bitcoin platforms and exchange services have launched in Kenya, it is paramount to provide direction to protect Kenyan consumers. Furthermore, as long as this alternative currency exists in the grey area of legality it is impossible for the Government of Kenya to regulate

or interfere with making new currency that recognizes examines and weighs the possibility of crypto currencies imperative.

The Bitcoin technology can be better explained by the diffusion of technology theory. People using the technology are in different stages of the adoption process. The majority of the population is still at the persuasion stage considering the small number of people using the Bitcoin platform. This research sought to bring out the advantages and disadvantages of using the technology so that people will be informed when making the decision on whether to adopt Bitcoin or not. Secondly, the rate of adoption has been stiff with Bitcoin first coming into the scene in 2009 but seeing a lot of usage to around 12 million Bitcoin at the time of this research. The adoption of Bitcoin technology is well manifested in the adopter categories of the Diffusion of technology theory with innovators being on the front line of Bitcoin making a lot of money mining and transacting Bitcoin. Early adopters will include the Businesses that have accepted payments via Bitcoin. Bitcoin can tentatively be argued to be attracting the attention of the early majority who are seeking information about its operation, security and regulations in the view of adopting it in future.

Opinion leaders will have the most influence during the evaluation stage of the innovation-decision process and on late adopters of the Bitcoin technology. Depending on the way they will actually shape the opinion on whether Bitcoin is a good currency on its merits or it's an insecure currency based on the reported security breaches, these opinion will be shaping Bitcoin's adoption in the future.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1. Summary Findings

The research established that BitPesa actually reduced the cost of international funds transfers to Kenya. This comparison revealed that significant savings are particularly pronounced for small transactions when using Bitpesa. Secondly, the research showed the biggest challenge facing the Bitcoin currency adoption is on the side of the users who have challenges understanding the concept of Bitcoin and how it can significantly reduce the cost of sending funds internationally. Finally, the research established that the Central Bank of Kenya Act is not equipped to regulate and respond to the launch of these complimentary currencies like Bitcoin. The Central Bank of Kenya Act should be amended to include regulatory guidelines for complimentary currencies and crypto-currencies.

5.2. Conclusions

In conclusion, the use of Bitcoin actually reduces the cost of international funds transfers as compared to traditional funds transfer services like Western Union and PayPal. Bitcoin offers considerable benefits to people sending micro remittances across borders and is an efficient system considering that the transaction takes a maximum of 10 minutes to complete. Secondly, the challenges faced on the adoption of Bitcoin as a new technology are common to new technologies. Considerable awareness and training needs to be done to the potential clients of the system to ease use and reduce the resistance to change that might be caused by fear of change. Thirdly, there is still room for considerable input by regulation agencies and governments to evaluate Bitcoin and develop inclusive regulation that governs proper usage of the new currency, protecting users and online consumers while at the same time allowing the innovation to realize its full potential.

5.3. Recommendations for Policy and Practice

Because digital currency knows no national boundaries, it may require an international solution and, thus, may involve Kenya working with international partners. Traditional

payment systems which involve monetary systems are set up in statutes and regulations and overseen by central banks and transactions processed by banks and other authorized or chartered financial institutions. Kenya might need to look at the international policy makers like the European Union and International Monetary Fund for further direction on the treatment of digital currencies. Despite digital currencies being volatile, difficult to trace and easy to trade, and considering the fact that Bitcoin platforms and exchange services have launched in Kenya, it is paramount to provide direction to protect Kenyan consumers. Furthermore, as long as this alternative currency exists in the grey area of legality it is impossible for the Government of Kenya to regulate or interfere with making new currency that recognizes examines and weighs the possibility of crypto currencies imperative.

5.4.Limitations of the Study

The major limitation of the study was that it was a case study which means that data collected about the challenges the company faced on the adoption of Bitcoin in Kenya might be unique to them. The population presented might not be adequate to bring out the true and correct picture of the whole population. Secondly, this being an exploratory research has its limitation in the sense that there was no literature to learn from. Lastly, due to the newness of Bitcoin, most of the material used for this research were drawn from the internet and may be inaccurate, subjective and opinionated.

5.5.Suggestions for further Study

This research suggested that more should be researched on the factors affecting the adoption of Bitcoin in Kenya using a bigger population as opposed to a case study.

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Appendix A: Questionnaire Guide

I am currently a student at the University of Nairobi pursuing a post graduate degree is Masters of Business Administration. This questionnaire seeks to collect data to find out the information on Impact of Bitcoin on E-commerce in Kenya. Your responses will be kept as confidential as required. Your contribution and opinions are highly valued.

Interview Guide

1. What factors make made you choose Kenya for your African headquarters?
2. What can you are the challenges you faced when setting up shop in Kenya?
3. What motivated the need to integrate Bitpesa system with M-PESA?
4. What are some of the benefits that users derive from the use of Bitcoin digital currency in Kenya?
5. What is the cost of a Bitpesa transaction using Bitpesa?
6. How does the cost of Bitpesa transaction compare to your competition?
7. What are the challenges that users have faced when using Bitpesa's system?
8. How do you caution yourself against losses from Bitcoin price volatility?
9. Do you think that users must have some certain degree of literacy to be able to use Bitpesa system?
10. Have you ever been attacked by Hackers? If yes, how did you deal with it?
11. What are the measures that you have put to ensure that there is security in the Bitpesa online system?
12. What regulation does Bitpesa subscribe to?
13. Has the government of Kenya done enough to support Bitcoin adoption and what do you think needs to be done to make it available to the masses.
14. In your opinion, do you think it is necessary to regulate Bitcoin?
15. What do you think is the future of Bitcoin in Kenya?