EFFECT OF MOBILE MONEY TRANSFERS ON FINANCIAL DEEPENING IN KENYA

BY

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DECLARATION

This research project is my original work and has not been submitted to any other university for academic award.

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This project has been submitted with my approval as the appointed University supervisor.

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ABSTRACT

In Kenya mobile money transfers are making financial deepening even more realizable as demand for money transfer services continues to increase. Since introduction of mobile telephony in Kenya in late 90's, cell phones have acted as a means of cash transfers for all types of transactions plans which are in line with the financial institutions. The practice has long-time been the norm in the new era of technology which keeps on changing for the better. For a long time there has been a widening gap as a result of developed worlds and the struggling emerging markets to penetrate the new markets. Just like the Sub-Saharan Africa, which have had a chance to enjoy handful landlines which are managed through a miniature broad band, quite a sizeable number of people didn't have access to banks and a huge chunk of the economies relied on cash. Since the year 2020 there has been a 101% increase from 2% by 2019 of mobile phone penetration. With these big strides, Mobile Money Transfer services, M-pesa being the first one, was introduced in March 2007. Financial services providers have since used the platform to offer their services to the mobile users and customers. The purpose of the study was to establish whether this has had an effect on financial deepening. The researcher used descriptive research design by use of secondary data to be collected from central Bank of Kenya, communication authority and Kenya National Bureau of statistics for 10 years period between 2011 and 2020. The analysis was undertaken by the use of multiple linear regression where quarterly data was collected for the study period. The regression model had a coefficient of determination of 79.4% indicating that it was a strong model and could be used to predict changes in financial deepening to an extent of 79.4%. The study rejected the null hypothesis and therefore concluded that money transfers have a significant effect on financial deepening in Kenya. The study variables of internet banking, mobile banking, agency banking and money lending had significant and strong correlations with financial deepening. The study concluded that mobile transfer has a positive and significant effect on financial deepening for firms in Kenya. The study therefore recommended that the government should ensure that it undertakes tremendous steps to enhance mobile transfer and implement regulations that would ensure that there is a more controlled and responsible system of mobile money transfer in Kenya.

ABBREVIATIONS

ANOVA- Analysis of Variance

ATM- Automatic Teller Machine

CBK- Central Bank of Kenya

CCK- Communications Commission of Kenya

FSD- Financial Sector Deepening

GSM- Global System of Mobile communication

MFS- Mobile Financial Service

MMT- Mobile Money Transfer ROSCAS- Rotating Savings and Credit Associations SACCO- Savings and Credit Cooperatives SPSS- Statistical Package for Social Science

CHAPTER ONE: INTRODUCTION

1.1 Background of the study.

Provision of financial services is an area that has seen gradual growth in Kenya since 1896 when the national bank of India was established to provide currency to trade that was thriving then, followed by Bank of South Africa in 1910.

With changing human needs and advent in technology which has brought about digital transformation, the financial sector has greatly evolved over time. What started off as mere safe-keeping and currency provision has burst into a dynamic evolution of financial services dramatically increasing the services in size and geographical spread. Technology advancement in communication has prayed a great role in revolutionizing the financial sector growing from physical institution to virtual institutions not limited by space and borders, extending the stretch of formal financial services, a key driver of economies advancement and development.

Despite these advancement and progress made in provision of financial services, many remains unreached thus exclusion from these financial services. According to the Bank for International Settlement (2018), while mobile money transfer may be understood as the automation of financial services with use of innovative information, the emergence of new business models as a result of utilization of big data has given mobile money transfer the capacity to disrupt the traditional financial intermediaries such as banks. Big data could be linked with Artificial Intelligence (AI) algorithms, deriving value from advanced computing power, for instance, cloud computing, mobile hardware, and mobile storage via the cloud which facilitates continuous accessibility. The outcomes of the new techniques results in lower costs of financial intermediation and product improvements for the consumers (KPMG, 2017).

Mobile technology has provided a huge opportunity in emerging economies to bridge the exclusion gap. Since the development of the first mobile gadget in 1973, mobile communication has largely been accepted globally. Out of this 4.78 billion phone users which constitutes a 61.5%of the world population, 3.5 billion (45.05% of the world population) own either a smart phone or Multiple smart phones. The development around mobile telephony has driven innovations one of them being mobile money transfer. The concept of mobile money started in Kenya in March 2007 (Binyanya, 2014), which was a service modernization capital for financial transaction through the mobile phone. There has been on a robust change for the mobile service banking system that has provided a lot of solution to the weak institutional setups and the cost-structure of traditional and conventional banking (Aron, 2018).The study relied upon three paramount theories of Innovation diffusion theory, Financial Intermediation theory and Financial deepening theory.

The untapped financial market by the Kenyan banks is still large which occasions the mobile money transfer companies to venture into. Globalization, increasing customer needs and the increasing number of industries in the sector has led to higher levels of competition and market share and for Kenyan banks to enhance financial deepening and remain competitive; forming collaborations with mobile money transfer companies is mandatory. This study sought to analyze the financial growth and development of mobile money transfer and its effect on structure of the banking sector and strategies of incumbents and future entrants in terms of addressing operational costs. Close to 83 % Kenyan with age of majority have access to formal financial facilities and services while only 11% are excluded from such facilities and services according to a house hold survey conducted by FSD Kenya in partnership with CBK and KNBS. (fin access report, 2019). This is a great jump compared to 27.4% recorded in 2006.

1.1.1 Mobile Money Transfer.

Mobile payment basically refers to transmission or transfer services operationalized under financial frame work of regulation, performed from or through a mobile device. Other than paying with liquid cash, credit cards or cheque, traders receive cash through the mobile and the same can be considered and honored for cash which is fast, reliable and a safe mode of money transfer of depositing and cash withdrawals, via mobile phone which is convenient and easy way (Aron, 2018). This has changed the way of life and the way businesses are conducted in both developed and developing markets. Mobile Money Transfer comes from two words; finance together with technology. It is elaborated as novel technologies that back fiscal amenities. In the forthcoming years, banks are predicted to offer social network podiums with which customers can allow their mobile gadgets to made benefit of investment prospects courtesy of fiscal technology (Drew, Andrew & Neil, 2017). Financial technologies are also defined as any technological innovation that is impacting the financial sector and its operations. They could also be referred to as a combination of financial services and modern technologies offering internet based and application-oriented services which are user friendly, computerized, clear together with effective (European Banking Federation, 2015).

However, numerous academicians have pointed out saying that payments space is the most advance segment among the Mobile Money Transfer (Douglas & Janos, 2015). Financial Technologies have been able to impact on various shareholders in the monetary industry. It has propelled to improvement of property managing services via presenting wealth management facilities to retail clients via basic systems, proposals of algorithms to back the policymaking procedure together with artificial intelligence management of collections via robots. It has in addition impacted the banking sector through monitoring savings, credit scores, spending, tax liability, provision of banking services beyond traditional banking, quicker transactions via distribution ledger technology, mobile transferences, use of crypto

currencies and also mobile lending to individuals , and Small and Medium, Enterprises (SMEs) using data analytics (KPMG, 2017).

The study analyzed mobile money transfer aspects that included; mobile banking, internet banking, agency banking and mobile lending. Internet banking was measured by the total transactions carried out in the platform over a specified period. The total number of mobile banking clients registered in a specified period measured mobile banking. Total number of agencies operating in a given period measured agency banking. Mobile lending was measured by total amount lent out using the platform in a given period.

1.1.2 Financial Deepening.

Financial deepening basically indicates an increased supply ratio of money to GDP, which is a times assumed to be the price index which is money reaching out to more population or users in the economy. The more money-flow is available in an economy, the more earning opportunities exist in terms of jobs for continued growth. It is generally the increase in source/supply of the financial assets in the subject economy (Nyasetia, 2012)

Efficiency in banking has been described and analysed in various perspectives such as; scale efficiency which is the association between the output level and the average cost, operational efficiency which computes the deviation from the cost efficient parameter which represent the maximum output attainable for a given inputs level and scope efficiency which is the association between average production costs of diversified output frontiers. In accordance to the different definitions, inefficiency is thus a multi-dimensional concept that is defined based on the purpose in which it is being used (Leibenstein, 1966). Thus, operational efficiency represents the management's ability to control costs and utilize the available resources for production of output (Kumbhakar & Sarkar, 2003).

In principle, an economy with a variety of intermediary activity and one that has multiple options does more towards generating allocations efficiently. This is usually measured the "monetization ratio" and intermediation ratio which are the two quantitative measures. The monetization ratio is a composition of money-based pointers. The pointers are like intermediation ratio which has the pointers that are related to bank-based measures, broad money supply to GDP ratio. They are usually to the compared to the capital market and private sector in the stock market as capitalization ratio (Tin, 2015).

Financial sector deepening and financial development have a relationship. Financial sector deepening is a catalyst for financial development which brings about resources pooling and efficiency in investments. A well maintained and supported financial system accelerates the growth of an investment or a saving for a higher physical capital accumulation of assets. This also fosters for competitive advantage of the innovative activities that are dynamically efficient. (Estrada, 2010).

Financial players and intermediaries, play a critical role in the economy by boosting units with deficits with funds from units that have surplus funds. They bridge the gap in different needs of borrowers and lenders by changing small-size, low-risk and vastly liquid deposits (bank liabilities) into loans (bank assets), which are of loftier size, higher risk and illiquid, transforming them into the main source of external funds to firms and for firms (Uremandu, 2013). The challenge of imperfect is usually causes information asymmetric which extends to agency problems. Several studies have been done with the aim of realizing the better functioning financial intermediaries that affect the growth of an economy. Institutions ought to exercise corporate control of mobile savings in case of information asymmetry which can lead to high transactions cost just to reduce the amount of cost associated and the risk attached to it.

(Casu et al., 2006) insists that incase of Intermediaries drive innovation around financial services, efficiency in allocation of resources and significantly reduces transaction costs.

1.1.3 Mobile Money Transfer and Financial Deepening.

For a long time, blocking various segments of the population from accessing formal banking services has hindered financial deepening. This inadequacy, termed as "financial exclusion", has been there due to access limitation due to weak financial institutions networks and lack of technology that can facilitate both reach and convenience of offering these services to the unbanked masses. As of 2011, the total adult population in the world was estimated at being 5 billion, and 2.5 billion of these adults were holders of bank accounts, whereas 2.5 billion were unbanked. The marginalization of this huge population from financial services entirely in the world would be elucidated through weaknesses such as the high and exorbitant costs of maintaining enough numbers of bank branches in remote and rural areas that are unbanked and the inability of the poor to maintain the required minimum balance and pay the regular bank fees and charges for standard bank accounts (Aron, 2017).

This notwithstanding, due to the contribution of Financial Inclusion in terms of fighting against poverty and attaining greater and more inclusive growth, the latter has become, since the beginning of the 2^{nd} decade in the 21st century, one of the supports of the international development agenda (Banque de France, 2014). As a result, most world economies began bringing together actions aimed at reducing financial marginalization in their development strategies. In consequence, the period between 2011 and 2014, about 700 million adults had started operating bank accounts, and as a result the number of the unbanked went down by 20% to only 2 billion. This has largely been made possible by innovations in the area of offering financial services one of them being Mobile Money, which has become a significant solution to bridging the gap of financial exclusion. Mobile money Transfers has amplified the

reach to masses through introduction of merchants and agency networks spreading even in the most interiors of rural areas.

In sub-Saharan Africa, with the aim of allowing for a larger segment of the unbanked to access financial services, the mobile phone has become more widely used as a support for widening financial services even beyond the confines of bank branches. Mobile financial services were first used in Kenya in 2007 through the M-PESA platform by the Safaricom mobile telephony company. The Mpesa Platform has since spread and grown to other countries such as Tanzania, Lesotho, Democratic Republic of Congo, Ghana, Mozambique and Egypt.

1.1.4 MMT and Financial Deepening in Kenya.

Kenyan financial sector has gone through a lot of rapid evolution and transformation over the last 70 years, the greatest of this transformation happening from year 2002.Since the colonial times there has been a lot of tremendous change in the banking sector which has resulted from differentiated country's political changes and hence touching the economical state of the country at large. During the colonial times, activities with the foreign market banks which were immensely operated and managed by the expatriates, were mainly of colonial farmers and merchants. (Heyer et al, 2015).

In Kenya, there are various mobile money transfer platforms offers various services which have penetrated the market offering various services. Communications Authority of Kenya (2018) reported that the following companies registered with them carried out mobile money services, Airtel Networks Ltd, Safaricom Plc, Finserve Africa Ltd, Telkom Kenya Ltd, Mobile Pay Ltd and Sema Mobile Services. Other companies carrying out payment services though not registered with regulators include Cellulant, Jambopay, Pesapal, and others. Companies such as Branch, Tala, Micromobile among others offer mobile lending services to

individuals while Musoni, Saidia and Umati Capital loan to business. There are those that offer Peer to Peer (P2P) lending services like Odyssey Capital, and PesaZetu.

It's assumed that when the blacks took power from the year 1963 to 2000, there was a comradeship phase of ('Harambee'), from 1963 to 1980, that resulted in the Kenyan owned banks. They were one-branch banks located in capital city, Nairobi and credit supply was defined by colonial commercial banks. They were very traditional, conservative and highly limited the advancement of credit facilities, fueling exclusion to excessive heights. This led to shipment of capital from underdeveloped countries to developed countries. (Grosh, 1991) opinioned, that most of the financial institutions did not embrace most of the current activities like lending in the banking sector.

The next phase ('Nyayo') saw most of the institutions being built up through the political strong connection of both banking systems and the non banking financial bodies (NBFIs) which included the inception of local banks, with present strong political affiliations. Following up was the 'Liberalization' phase, that lasted for almost ten years from 1990 to 1999, and stirred up banks growth but were challenged by frequent instabilities hence most banks failing to grow.

Although there were immense effects during the liberalization phase, which led to increased deposit levels, the overall stability and depth of management of the banks were not to the current standards. of the financial sector. in addition, there wasn't any easy format of financial access since it was not a major consideration the Central Bank of Kenya or any financial institution.((Ngugi, 2000)

('Transformation') was the subsequent phase that lasted for twelve years from 2000 to 2012 when changes in the regulatory environment were made in 2000, the rise of large locally owned

banks, competition and technology advancement around financial services. Mobile money has evolved further and transformed banking sector through frequent outreaches for accessibility. (Heyer et al, 2015).

It has been a case of mutual relationships where banks and telecom companies and merchants provide services through mobile transactions applications systems. These applications systems are synchronized for either payment of bills or cash withdrawals from the system like the Automated Teller Machine (ATM). (Binyanya, 2012) opinioned that there has also been bank to bank transactions hence easing the mobile money link service to be easier and quicker for the users and other system operators.

Creative ideas, understanding consumers and innovative methods are some of the key points to remain relevant in offering financial services, has been the major driver of financial inclusion. This is additionally driving the transaction costs down thus more population accepting it and consequently increasing the reach and access to unthinkable areas. Recently there has been a spillover of banking services to Telco's though there is a limitation in the services they can offer since Telco's do not have banking licenses. Banks on the other hands have room for wide range of financial services offerings thus the future lies in strategic partnerships and alliances (Pelletier et al, 2020). This is already happening with Mshwari, fuliza, KCB-Mpesa which are micro-loans offered by banks partnering with Telco's further advancing financial deepening.

1.2 Research Problem.

Globally, out of 7.7billion people, 4.78billions people have either a feature phone or a smart phone, a 61.51% of the global population. 3.5billions own a smart phone, 45.04% of the global population. It's predicted that by 2023, the devices users will shoot to 7.33 Billion. By 2025, 72% of the mobile users will solely use smart phones to access the web (Turner, 2020)

Evidently, mobile phone use and penetration has been on an incline trend creating more opportunities for increased Mobile money adoption and consequently financial deepening. Smart phones applications creates avenues for online transactions, monitoring bank transactions, paying bills, accessing loans, buying government instruments and crucial government services like stipends to the elderly populations. The ever changing mobile technology has evidently, revolutionized the formats of financial services systems in terms of management hence, sanctioning organizations in to new untapped markets and models that can be helpful to its customers Over time, the costs related to these services have dropped owing to innovations by competing firms and technology advancement.

Several studies to document these changes, transformations and advancements have been done in Kenya and beyond. Recently, Kigen (2011) did a study in Nairobi focusing on transaction cost impact on Micro-finance institutions and concluded that the new money mobile technology has immensely reduced the costs associated with transactions microfinance institutions (MFI).this has really championed for more discoveries of untapped markets and penetrations into new platforms of the financial sector. Blauw and Franses (2011) carried a study too on the economic impact of the mobile utilization in relation to the economic development in Uganda. They realized there exist a positive correlation between the mobile use and the economic development of the country and could be a poverty tool eradication mechanism. Binyanya (2012) in his study on the effect of Mobile money transfer concluded that mobile money transfer has significant effect on financial deepening. However His study was at a time when banks hadn't started their own Mobile Money payment platforms. The phone usage penetration level at the time was 78%. This has greatly changed and currently phone usage penetration is at 98%, internet penetration at 43% and social media use at 17% as at January 2020 (Kemp, 2020).

This study therefore seeks to answer the following research question; is there an effect of mobile money transfer services on financial deepening in Kenya in and to what extent does it impact the gross domestic Product. Has introduction of bank-owned Mobile money transfer platforms had any effect on financial deepening in Kenya? This study agitates to establish a gap know how of mobile money effects on financial deepening an anticipated developing economy in Kenya.

1.3 Objective of the study.

To establish the contribution of mobile money payments to financial deepening in Kenya

1.4 Value of the Study.

The study will be of great value to various players:

The general public will be informed about the contribution of mobile money transfer on economic growth and how they use the platform to access financial services conveniently. This is in line with the belief that 'information is power' and thus puts the users at an advantage as well as mobile money service providers towards improved services.

Central bank of Kenya (CBK) organization among other bodies will gain a lot from the study findings for use in their management, policy formulation and implementation on different scopes and frameworks that are affiliated to the mobile money transfer services. These factors with regard to the policy regulations and guidelines formed due to the study finding will add value to the totality of the economic development of the economical returns from the financial sector.

The scholar in the education sector will also have a pie of the study finding for there endeavors research that can be a source of information for developmental research in their studies. The research findings will also bring out more research gaps that can be studied in future by

academic scholars for developmental research and also to seek more critical information for their studies. Nevertheless, the research will also propose areas of further studies where future academicians, scholars and researchers increase their knowledge base on theories.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction.

This section is the foundational base for the study as it reviews past studies and general theories that support the study. The relevant literatures also elaborated in this chapter with supportive theories looked three elaborative theories of Innovation diffusion theory, Financial Intermediation theory and financial deepening theory.

2.2 Theoretical Literature Review.

2.2.1 The financial deepening theory.

The financial deepening theory delineates financial system role focusing mainly the sectoral activities for the economic growth .this focus is aimed at understanding the theory behind an intermediary economy performance in terms of efficient resource allocation for high profitability. This can also go an extent of searching the size of the sector since it's measured by quantitative indicators which are intermediation ratio and monetization ratio. The monetization quantitative ratio is a composition of liquid liabilities and the money-based indicators measured against the GDP ratio while the Intermediation ratio is a composition of bank-based pointers which could be private sector bank credits measured against the capital market-based pointer or stock market for capitalization ratio. In this study, the level of intermediation to GDP, that is broad money supply to GDP ratio, will be taken as a broad measure of the size of the financial sector (Karahan and Metehan, 2011).

Karahan and Metehan (2011) expressed only three view concerns for financial deepening. The "supply leading theory is the base thought, that has a lot of positive backup on financial development for economic growth impact of financial development on economic growth. The ‘‘demand following theory" is another thought which contemplates the existence of different

financial triggers that influence finance flow in the real sector the real sector. Finally, another approach somewhere between these two views is the one that claims mutual impact of finance and growth, which can be called “bi-directional causality theory”.

2.2.2 Financial Intermediation Theory.

Financial intermediation is a causative that assists in devolving funds to the deficit financial institutions and sectors or units from the surplus sectors in an economy. Bisignano (1998) and Leland and Pyle (1977) opined the differentiation of intermediary institutions into four parts that include; liabilities (deposits) that are categorically put in and has no financial deepening relation to the portfolio. The other differentiation is having short term deposits that are even less than their asset value. The third differential is a state of liability withdrawals higher than their demand (chequeable) and lastly, is having non-transferable assets and liabilities. The paramount intermediaries’ contribution is a high maintenance of funds flow to the deficit units from the surplus sectors.

Scholtens and van Wensveen (2003) conclude that the essence of a financial intermediary in any economy is to agitate for funds movement to deficit sectors by providing specialized financial commodities in the market. These are only possible in case there are untapped markets for intermediary that it’s in a position to meet all expenses and cost associated both direct and indirect cost of production in a sector. Perfects markets with no information asymmetries of cost relations do not have financial intermediaries, unlike the imperfect markets with a lot of buyers and sellers in a mixed information state.(Leland and Pyle, 1977) stated that in an imperfect market with a lot of asymmetrical information, borrowers have a verse understanding of their lenders collateral diligence and industriousness.

2.2.3 Innovation Diffusion theory.

Diffusion of innovations basically, is a theory that tries to explain how, the reason why, and at the rate at which new ideas and technology get to the market and spread. The theory was advanced by Everett Rodgers in his book Diffusion of Innovations published in 1962 and edited in 2003 (Rodgers, 2003). He reasons that diffusion is the process through which an innovation is made known over time among the Players in a social system and how an Idea gets popularity and diffuses into a social system. The diffusion is dependent on the innovation itself, communication channels, time, and a social system, with heavy reliance on human capital. For self-sustenance of the idea, it must be widely accepted.

New ideas and inventions like mobile lending, internet and other financial services riding on these platforms are adopted and become successful in the carrying out of the business Mitchell (1990) elaborated that innovations on financial deepening strategies are performed cautiously aiming for unique ideologies. Since the evolvement of the mobile technology most users have embraced the new technology of money transfers. Since then there is high level of transaction level in the mobile platform, most interested user have come up with different apps that can assist in serving the users through the platform. Most banking sectors, financial bodies like the SME and the any financial associated institutions have embraced the technology use.

The African Commercial bank stated a loans disbursement statistics through the platform of M-shwari at the end of 2014 to be standing at 21 million. For mobile lending to be successful, transactions should be well-matched and compatible. Compatibility is the extent to which things are able to work together in integration without any problem. In mobile lending setting, customers should smoothly transact without any hurdles through the mobile platforms. Complexity conversely relates to the energy or effort needed to understand and comprehend the technological changes. The diffusion thought on mobile banking encourages the

commercial banks to embrace and implement the mobile inventions for the betterment of their services and financial deepening.

2.3 Determinants of financial deepening.

A determinant is an element that decisively influences and affects the nature or outcome of something Frank (1989). There vast factors that deter the financial development in different sectors. Voghouei et al. (2011) states the common determinant that maybe causative factors of financial development hindrances may include financial liberalization, institutional rules and regulations on operating policies, the traditional legal laws of the institutions in line with the mobile development and lastly the technological adherence to embrace the use in the current evolving markets.

2.3.1 Legal Framework.

Lopez de Silanes et al. (1998) advanced one of the most influential concepts that outline the role of legal traditions in financial deepening. He explains why level of financial development and deepening is different in different countries. He points out the value of property rights protection and contracts enforcement which forms a framework of engagement between shareholders and creditors. The existence of varying legal tradition, favorableness and their adaptability create disparity in strengths of countries financial systems (Merry man, Clark, & Haley 1994). Thus, focus of any government should be the how adaptable a legal system is and whether it can adjust or reshape based on level of financial development

2.3.2 Institutions

Varying economic institutions determines the level of financial and economic development and consequently financial deepening. While some institutions in some countries support the rule of law and create a favorable environment for long term investments, some are harmful

for this advancement. Pagano &Volpin (2002) proposes that there exist a high regulation and rules enforcement, mechanism put on formats of resource allocation, to institutions, economical groups and argue that balance of power distribution among institutions, social amenities and to the economic groups across countries. All these are with an aim is to strive for financial development in the different sectors.

2.3.3. Financial Liberalization

Financial liberalization is a concern of the totality factors associated with government denationalization of corporate bodes like banks among other financial institutions that can have a complimentary access into the central bank and other financial sector through their attainment of and chartered independence, credit elimination among other tools of policies and regulations on credit mechanisms, control and implementation (Arestis, 2006). Liberalizing financial markets ought to pilot for an enhanced allocation strategy for their resources, investments superiority level for a high efficiency.

2.3.4 Openness Policy.

Significant increase in trade and capital liberalization favors welfare of a country and consequently extends to international trade and capital flow which develops a financial system. Bzhalava (2014) observes that export and import systems can be roused by trade openness. This level of openness results into increased level of financial depth.

2.3.4 Political Economy Factor.

(Beck Et al, 2001) suggested that a country's financial systems constrained on different political regimes are in a high chance of being duped for a longer period of poverty line unlike the free democratic countries. The political economic factors have a high indirect factor that a lot of impacts on the financial deepening of an institution, corporate body hence less penetration of the financial development. Democratic countries can have a lot of influence

since the users are supportive of the control systems and the constrained attached on the mobile phone self control system.

Lopez-de Silanes, La Porta, & Shleifer (2002) gave a conclusion on countries with democratic financial systems to be financially developed. The inter-correlation is the central point that draws attention to the democratic system of the diminutive motivation to sustain the financial institutions for public ownership and thus can have a high supportive measure and trend for financial development.

2.3.5 Technology

The introduction of mobile telephony and evolution of technology around it have made a useful contribution to further development of financial systems and consequently financial deepening. Ways of doing business have been greatly changed bringing about efficiency, convenience and lowering transactions costs. Mobile money transfer being the most recent innovation has been greatly and widely adopted and integrated into many financial systems, enhancing reach through agencies and significantly lowering costs of financial transactions and this have had a positive impact on financial deepening.

The above aims at leveraging increased money supply ratio to the GDP. They are financialialy measured aggregately like M1, M2 and M3 in relation to GDP. (Dogo and Nnanna,1998) Nzotta, 2004; recently, proposed that the financial deepening mirrors the money supply share of the GDP. M2/GDP is the most indicator common real world with a significant relation to the financial deepening when M I + is the associated deposits and the money market funds of a stated year. The other M1, M2, M3 are variables that exhibit money circulation and regarded as of money supply at any given time. The theory behind all these in an economy is a high money supply for circulation resulting to continuity growth and opportunities in an economy.

2.4 Empirical Review

Numerous studies have been done in this area by scholars in Kenya and beyond in an attempt to shed some light on the issue of financial deepening and advancement in mobile telephony and emergence of mobile money

Nyasetia (2012) explored a Kenyan savings and investment implication study on financial deepening and its implication. He resolved that there were both positive and adverse correlations in gross national savings, financial deepening and investments. The researcher made use of secondary data on financial deepening pointers, savings and investments between 2006 and 2011. When concluding, he confirmed that there was negative correlation, though weak, between financial deepening pointers and gross national income. There was nonetheless a little bit stronger negative correlation between financial deepening and investments. This was a sign that when financial deepening goes higher, investments tend to be lower and the reverse is also true. This is hence a clear inverse relationship between the two independent variables and financial deepening.

Nzayisenga (2016) also had an interest on financial deepening of Commercial Banks in Kenya. During his study he employed a cross sectional descriptive statistics. He studied all the commercial banks that were practicing mobile lending as at then and used secondary data from audited financial reports and statements, deposited to NSE and CBK. He analyzed data on the basis of mean and statistics of F test at 5% level of significance, and an analysis of Variance (ANOVA). He found out that there were variables in mobile lending that were positively influencing Kenyan Commercial Banks financial deepening which he listed as interest rates, capital adequacy and Liquidity. 47.4% of financial deepening could be explained by the five variables he studied which include Total Mobile Loans Applicants, Interest rates, capital adequacy and liquidity.

(Jack &Suri, 2011) did a study on economical brunts of Mpesa Kenya. They sampled 300 locations across Kenya, excluding northern and eastern parts that had limited coverage. From the sample location they randomly chose 10 households to take part in the survey. The study was based on 2,016 of the original 3,000 follow-up surveys they had conducted in 2009, a time when there were 4000 agents in Kenya where cross sectional descriptive statistics was employed on all the variables of the population. There were unavailable information from the major economic impacts were from the M-PESA platform of different household in a selected cluster due to the presence of a wide risk spread on the savings and investments. There was also reputable impact of the inflation and money supply at the macro-economic level, with an exhibition of a prolonged Central Bank monetary policy conduct on its policies (Jack &Suri, 2011).

Sanz, (2011), previously conducted a study on advancing measures on accessing mobile financial services. The main intend of the study was to ascertain whether IF mockups based on prepaid platforms and cellular technology could address the financial services efficiency in emerging markets of the developing countries. Between January and March 2011 there was a scrutiny of relatable factors that may have perhaps enlightened on financial services un-access. The thought behind this was a focus of up surging users of the mobile banking since the market embraced the industry for future profitability, cost reduction on services and creation of more networks for efficiency. The study dwelled on how Mobile banking has made financial access better.

2.5 Summary of Literature review

There is evidence from the studies that have been reviewed that most of them have focused on financial deepening effect towards the economic growth its development. The studies have also focused on other countries that are mostly outside the African continent. There is not a single study that evaluated financial deepening and mobile payments. This inadequacy in

addressing effects of Mobile money transfers in an environment where some banks have come up with their mobile payment platforms and deeper adoption of mobile phones and internet needs to be addressed. There is need therefore to find out Mobile Money payments have affected financial deepening in this new environment.

The studies reviewed have also indicated that financial deepening can reduce poverty in a country and lead to economic development. There has been a notable advancement in the financial sector through the mobile banking which has improved the economic efficiency, investment financial services and consequently its growth. There has also been a financial deepening which has affirmative triggered financial system and improved its growth economically. The level of and investments in an economy will also be subject to financial deepening. Without financial deepening in any economy, it may be difficult to achieve meaningful levels of savings in an economy.

2.6 Conceptual Frame Work

Rocco and Plakhotnik (2009) stipulate that a conceptual framework lays the foundation for research objectives and questions by grounding a study in the right knowledge constructs. The independent variables in this study were the aspects of Mobile Money Transfer, which include; mobile banking, internet banking, agency banking and mobile lending. Financial deepening is the dependent variable.

Independent Variables

Mobile Money Transfer Aspect

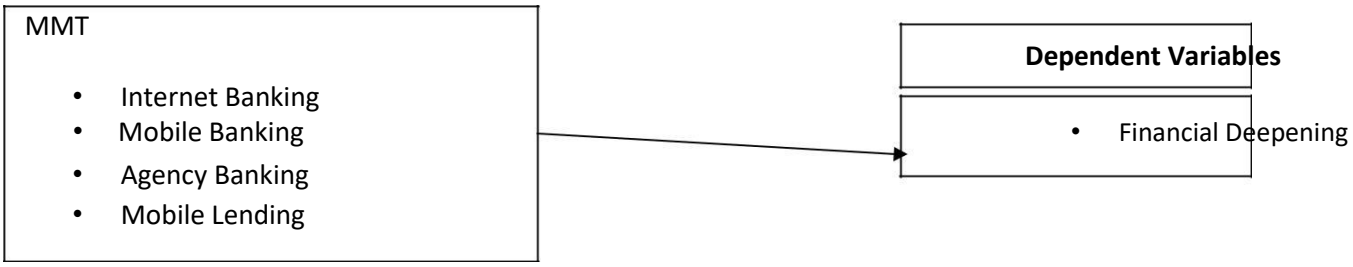


Figure 2.1: Conceptual Framework

From the diagram, mobile money transfer is the independent Variable measured by subscribers to mobile banking who request or transfer money through the platform, average transaction cost represented by CBK rates, total deposits done via the MMT platform and total loans applied and approved as a ratio of GDP. The control variable will be liquidity which will be measured by the total loans to customer deposits.

2.6.1 Summary of Literature Review and Research Gaps

There exists a relationship between mobile money transfer and Financial deepening (Kozak, 2005). Agency banking reduces the cost of establishing physical contact points with customers (Gardeva & Rhynea, 2011) and generally lowers transaction costs (Aduda, Kiragu, & Ndwiga, 2013). Thus, agency banking enables commercial banks to enhance their financial deepening efficiency (Mwando, 2013). Mobile banking greatly reduces transaction costs (Kigen, 2010).

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction.

This subsection explains the methodology of carrying out the research. It converses more on variables characteristics and the research design and also explains the preference of the research designs over the others. It also provides key information regarding the study background and its population critical characteristics. It also extends to scrutinizing the selected sample frame. The chapter also expounds on the data methodology and its collection instrument that was utilized during the study. In conclusion, the section also presents a data analysis methodology that was used and display statistical format of the generated study.

3.2 Research design

A research design refers to a blue-print that defines procedures and methods that the researcher intends to follow to reach at certain set objectives (Jonker & Pennink 2009). The study employed a descriptive research design. Basically, the study seeks to understand the phenomenon as they are without manipulating them. The design established the what, when, where, and whom of an occurrence so that more information was availed to help in building a profile.

The descriptive design adopted was cross sectional type because it involved all commercial banks in Kenya.

3.3 Population and Sampling.

The target population in this study was done on all commercial banks in Kenya. By 2020 February, there were 42 licensed commercial banks operation in Kenya according Central Bank of Kenya. The period of study was year 2012 and year 2020, covering periods when the mobile payment wasn’t wide spread and a period when it had made serious inroads.

3.4 Sample

All the 42 banks were studied thus a census approach involving data collected from central bank of Kenya where the banks information is deposited as a requirement for registration. Since the population of the study is small, census approach was used.

3.5 Data Collection

The study used secondary data, defined as data already collected and used for other purposes other than for the use only with the current study. It is an accurate and a cheaper method of data collection owing to its ease of access. This included data collected from Kenya Bureau of standards, Central Bank of Kenya and Communication authority of Kenya. Banks are required to strictly furnish CBK with data that is deemed critical to the industry on a regular basis. Quarterly data on mobile payment subscribers, Mobile transfer's deposits, bank deposits, bank loans GDP and Mobile subscribers was collected from CBK and Communication authorities of Kenya which closely watched the Mobile transfers due to emerging challenges of Money Laundering and Cyber Crimes involving the transfers.

3.6 Data Analysis

The study implemented Statistical packages for social sciences (SPSS) tool for the quantitative descriptive statistics. This study also analyzed its findings with the help of correlation on the variables to ascertain the connection of the variables. The study went an extra mile to find the mobile money transfer connection with the financial deepening mobile by use of the regression model below;

$$F_d = a + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where F_d = is an indicator of the Financial deepening ratio

α = the value of $\mathbf{F_d}$ When the value of **X** (other factors affecting financial deepening) is held constant.

$\beta_1 - \beta_4$ = Beta coefficients

X_1 = Internet Banking

X_2 = Mobile Banking

ϵ = error term

Table 3.1: Operationalization of the Study Variables

Variable	Measurement
Financial Deepening	Calculated as; (Interest Income/Operating Expenses). The average financial deepening of all the banks per quarter was utilized
Internet Banking	Log10 total transactions carried out in the internet banking platform
Mobile Banking	Log10 Total number of mobile banking clients registered
Agency Banking	Log10 total number of agencies operating
Mobile Lending	Log10 total amount lent out using the mobile banking platform

The above variables are the major determinants of Financial Deepening in financial sector.

3.6.1 Tests of Significance

The study adopted a confidence interval of 95%. The results were set to be statistically significant at the 0.05 level, which indicates that the significance value should be less than 0.05. A statistical inference technique was used in making conclusions relating to the accuracy of the model in predicting the market capitalization. The model significance was tested using

the significance values at 95% confidence. The meaning of the association amongst every predictor variable plus response variable were also determined by the significance values, which illustrated how much standard error indicated that the sample deviates from the tested value.

3.6.2 Diagnostic Tests

For the validity of regression analysis, a number of assumptions are done in conducting linear regression models. These are; no multi-collinearity, observations are sampled randomly, conditional mean ought to be zero, linear regression model is “linear in parameters”, spherical errors: there is homoscedasticity and no auto-correlation, and the optional assumption: error terms ought to be distributed normally. According to the Gauss-Markov Theorem, the first 5 assumptions of the linear regression model, the regression OLS estimators, are the Best Linear Unbiased Estimators (Grewal, Levy & Lehmann, 2004). The aforementioned assumptions were of great importance since when any of them was to be violated, it could mean the regression estimates could have been incorrect and unreliable. Particularly, a violation would bring about incorrect signs of the regression estimates or the difference of the estimates would not be reliable, resulting to confidence intervals that could either be too narrow or very wide (Gall, Gall & Borge, 2006).

The diagnostic tests were conducted so as to guarantee that the assumptions were met to attain the Best Linear Unbiased Estimators. Regression diagnostics assess the model assumptions and probe if there were interpretations with a great, unwarranted effect on the examination or not. Diagnostic examinations on normality, linearity, multicollinearity, and autocorrelation were done on the collected data to establish its suitability in the formulation of linear regression model. The Shapiro Wilk test was used to test normality. Linearity was tested by determining homoscedasticy, which was determined, by the Breuch-Pagan test.

Tests for multicollinearity of data was carried out using variance inflation factors (VIF) and Tolerance statistics to determine whether the predictor variables considered in the research were significantly correlated with each other. According to Grewal Levy & Lehmann (2004) the main sources of multicollinearity are small sample sizes, low explained variable and low measure reliability in the independent variables. Auto-correlation test was carried out through the Durbin-Watson Statistic.

CHAPTER FOUR

DATA ANALYSIS AND INTERPRETATIONS

4.1 Introduction

This chapter entails of the data analysis, interpretation and the discussions of the outcomes. The section hence is fragmented to three sub sections, which entail diagnostic tests, inferential statistics, and interpretation and the discussions regarding the outcomes. Precisely this chapter summarizes the platform for data presentations, analysis, interpretations, and discussions.

4.2 Descriptive Statistics

Descriptive statistics seek to describe data collected for each study variable in form of understanding the measures of central tendency, particularly, the mean and the standard deviation. Skewness as well as Kurtosis were crucial to describe the nature of data distribution.

Table 4. 1: Descriptive Statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Y = Financial Deepening	40	1.2415	1.7151	1.445	.087	.641	.374	1.973	.733
Internet Banking	40	1.5968	2.4517	2.107	.228	-.494	.374	-.556	.733
Mobile Banking	40	1.9562	2.7823	2.387	.213	-.360	.374	-.616	.733
Mobile Loans	40	1.5621	3.0864	2.611	.471	-.898	.374	-.102	.733
Agency Banking	40	1.1893	2.3219	1.786	.290	.081	.374	-.779	.733
Valid N (listwise)	40								

Source: Analytical Data, (2021).

Financial deepening was determined by the ratio of total income to operating expenses. It

brought out the aspect of changes in income as a result of modern ways of operations that would reduce operating expenses. The expectation was that with improved use mobile money transfers there would be increased financial deepening. The ratio had a mean of 1.45 with a low standard deviation of 0.087. The maximum value of this ratio was 1.72 while the minimum was 1.24 and thereby indicating that the changes were not as drastic. The skewness was 0.641 while kurtosis was 1.973.

Internet banking was depicted by the total value of transactions that were undertaken through the use of internet banking. The transformation of these values was undertaken through calculating the logarithm of these values. The mean was 2.11 while the standard deviation was at 0.23. Skewness to elaborate on the leaning of data was slightly negative at -0.494 and kurtosis at -0.556.

Mobile banking variable denoted the value of transactions undertaken by the commercial banks through mobile banking. The mean was 2.39 with a standard deviation of 0.21, kurtosis of -0.616 and a skewness of -0.36. The maximum value for this variable was at 2.78 with the minimum at 1.96. Similarly, mobile loans variable denoted the amount of loans that were issued by the banks through mobile money transfer systems. The mean was 2.61 and standard deviation of 0.47. The maximum value at 3.09 with the minimum at 1.56. The kurtosis was -0.102 and skewness at -0.898.

It is in the similar manner that agency banking variable was determined by the value of transactions that were undertaken through agency banking across the commercial banks for the study period. The mean was obtained as 1.79 with a standard deviation of 0.29. The value with the minimum was 1.19 while the maximum was at 2.32 with a low skewness of 0.081 and a negative but equally low kurtosis of -0.779.

4.3 Diagnostic Tests

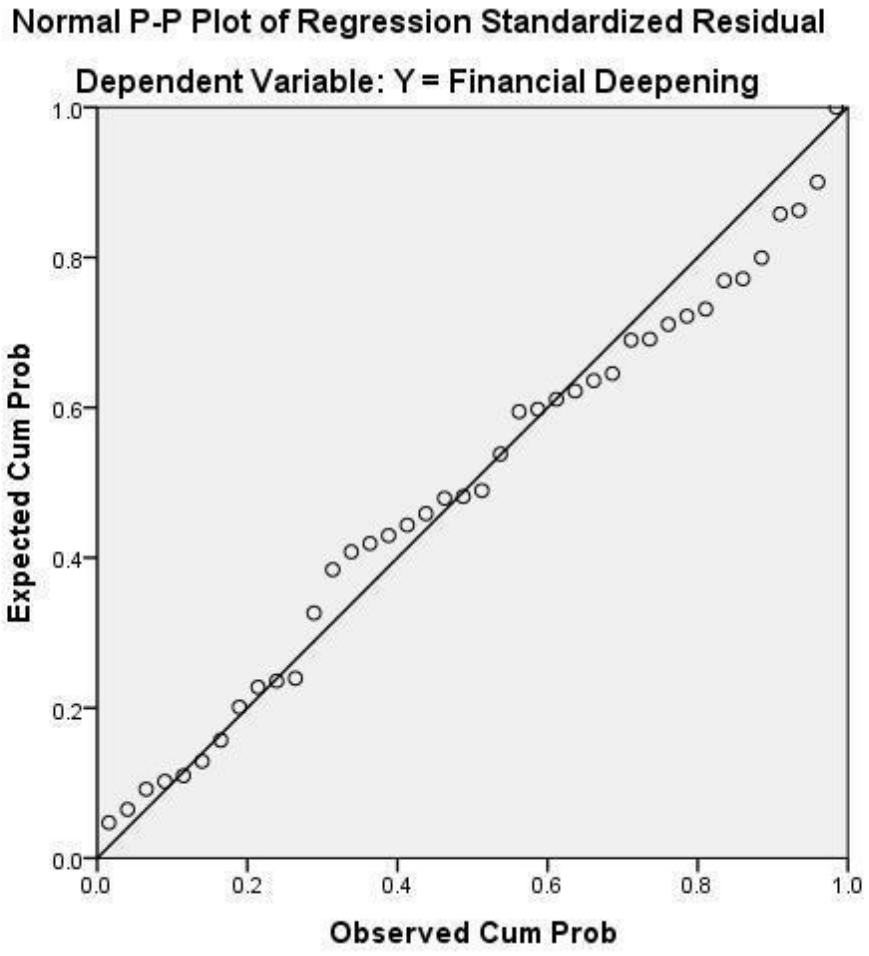
Diagnostic tests were conducted as a precursor to conducting linear regression so as to ensure

Best Linear Unbiased Estimates. Diagnostic tests done in this study included; linearity test, normality tests, homoscedasticity tests, multicollinearity tests, autocorrelation tests, model specification test, and stationarity test for time series.

4.3.1 Linearity Test

It is used to determine whether data may be expressed linearly. As such it is vital to ensure that data is presented in a linear format, since linearity indicates the capability of data to be made into a linear format, therefore plotting the data and observing the trend of the data would be a good indicator of whether linearity assumption is observed by the data or not. However, objectively a Normal P-P plot is preferred where the data is presumed to be linear if the plots follow the diagonal line.

Figure 4. 1: Normal P-P Plot

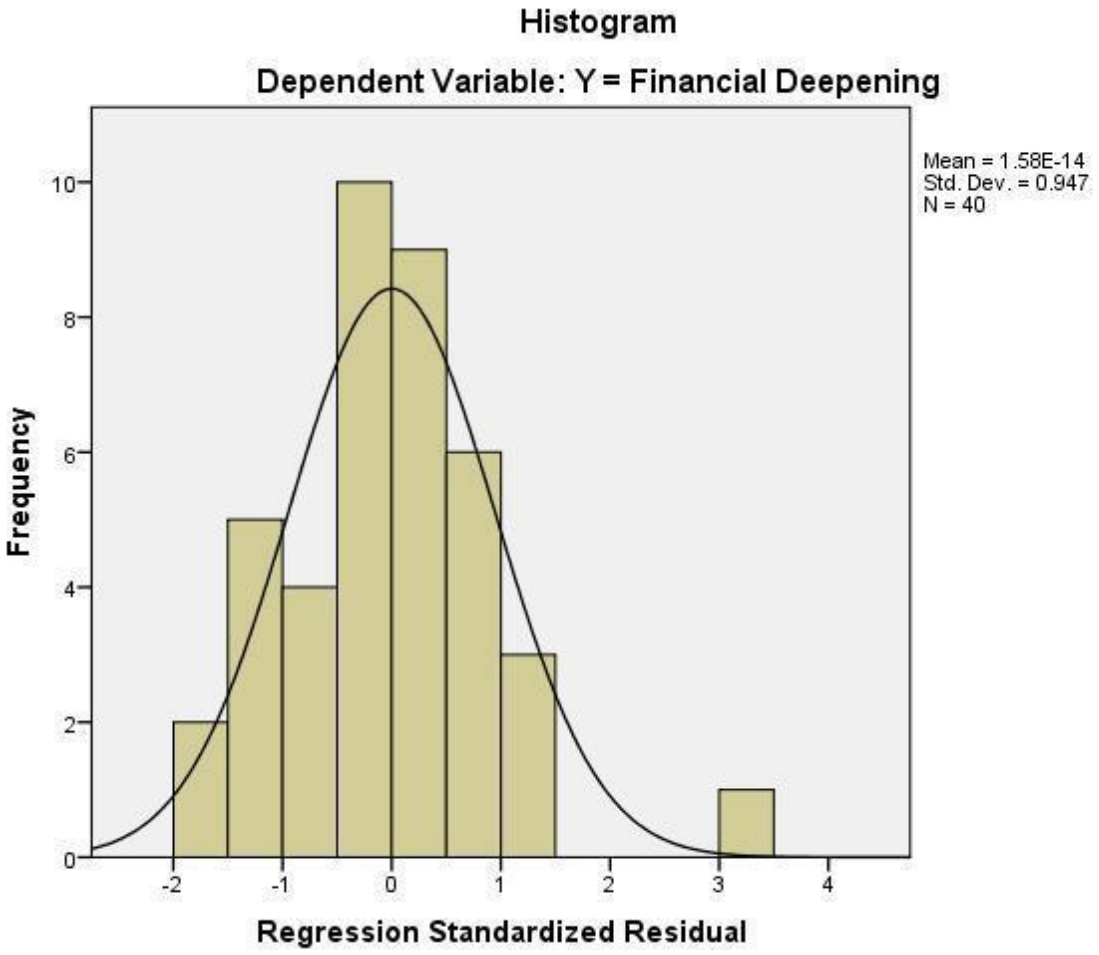


The normal P-P plot indicated by figure 4.1 indicates that the plots follow the diagonal line and therefore the data is linear.

4.3.2 Normality Test

It indicates that data distribution undertakes the bell shaped that is synonymous with normal curve. Plotting a histogram would indicate whether data distribution is bell shaped-indicating adherence to normality or not as indicated in Figure 4.2.

Figure 4. 2: Histogram



The histogram in figure 4.2 indicates that data has a bell-shaped curve and therefore it would be adjudged to be normally distributed.

A more objective manner involves undertaking a Shapiro-Wilk test whether the tests checks

the significance and suggests that data is normally distributed if the significance test fails to reject the null hypothesis (is greater than 0.05; p>0.05).

Table 4. 2: Normality Test

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Internet Banking	.086	40	.200*	.955	40	.113
Mobile Banking	.094	40	.200*	.967	40	.295
Mobile Loans	.156	40	.015	.867	40	.000
Agency Banking	.149	40	.026	.961	40	.186

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table 4.2 indicates that all independent variables have a significance greater than 0.05 indicating that all the variables are normally distributed, except Mobile Loans, which is not normally distributed. The variable was therefore transformed by standardizing the variable before undertaking further test.

4.3.3 Heteroscedasticity Test

It determines whether there exists homogenous distribution of residuals in that there is no bias indicating that they incline towards either positive or negative direction. A biased distribution of residuals indicates that there exists heteroscedasticity in the data and therefore the variables would be required to be corrected for homoscedasticity. The Breusch-Pagan Test was used to test for heteroscedasticity.

Breusch-Pagan Test

Ho: Constant variance

Variables: fitted values of Financial Deepening

chi2(1) = 15.59

Prob > chi^2 = 0.0001

The significance of the chi-square test that was undertaken by the test is less than 0.05

indicating that the null hypothesis is rejected. It therefore indicates that there is no constant variance within the residuals and therefore the problem of heteroscedasticity prevails in the data.

The data correction was therefore undertaken by transformations of the independent variables undertaken through standardization of these variables.

4.3.4 Multi-Collinearity Test

The test is undertaken since the independent variables should be independent against each other and correlation among the independent variables should not be significant effect that their ability to influence the dependent variable is compromised. The test is undertaken by using variation inflation factor where the standard rule is that if the VIF is greater than 10 then there is multi-collinearity in the data.

Table 4. 3: Multi-Collinearity Test

Coefficients[a]

Model			Collinearity Statistics	
		B	Tolerance	VIF
1	(Constant)	2.304		
	Internet Banking	.850	.947	1.056
	Mobile Banking	-.935	.984	1.016
	Mobile Loans	-.090	.927	1.079
	Agency Banking	-.102	.948	1.055

a. Dependent Variable: Y = Financial Deepening

Table 4.3 indicates that the VIF values of the independent variables is below 10 indicating absence of multi-collinearity.

4.3.5 Test for Autocorrelations

Autocorrelations in regression analysis is not desired and therefore data need to be tested on whether there exists positive or negative or neutral Autocorrelations. This is undertaken by

Durbin-Watson which is a score that indicates that values of the score ranges from 0 to 4. Values between 0 to 1.5 indicates negative autocorrelations, 1.5 to 2.5 indicates unbiased autocorrelations while from 2.5 to 4 indicates negative autocorrelations.

Table 4. 4: Durbin Watson Test

Model Summary[b]

Model	Durbin-Watson
1	.371

Table 4.4 indicates that Durbin-Watson has a score of 0.371 that indicates presence of negative autocorrelations. This entails that transformation of data was necessitated to ensure that the autocorrelation problem has been dealt with. Transformation of data was undertaken through standardization of the variables.

4.3.6 Stationarity Test

Stationarity test is undertaken for time series data that seeks to determine whether the change in the variables is as a result of trends or cyclic patterns and not through actual changes of variable. Actual changes of variables are therefore said that data is not stationary since there is no stationary process to influence the variables. Stationarity test is undertaken by comparing the R squared with Durbin-Watson Statistic. A greater R squared than DW statistic indicates that there is no stationarity in data, while the opposite is true. The R squared of the model is 0.794 while DW is 0.371 indicating that there is no stationarity problem in the time series data.

4.4 Correlation Analysis

Spearman's correlation was preferred in the study. Correlation analysis established whether there existed an association among two variables. The association fell between a perfect

positive and a strong negative correlation. This study employed a Confidence Interval of 95% and a two tailed test.

The independent variables are significantly correlated with the dependent variable. Table 4.5 indicates positive correlations against financial deepening and internet banking, mobile banking, mobile loans and agency banking. It indicates that increasing the values of independent variable it would lead to a significant increase in financial deepening that would lead to improved financial inclusion in the economy.

Table 4. 5: Correlation Analysis

Correlations

			Financial Deepening	Internet Banking	Mobile Banking	Mobile Loans	Agency Banking
Spearman's rho	Financial Deepening	Correlation Coefficient	1.000				
		Sig. (2-tailed)	.				
		N	40				
	Internet Banking	Correlation Coefficient	.810**	1.000			
		Sig. (2-tailed)	.000	.			
		N	40	40			
	Mobile Banking	Correlation Coefficient	.810**	0.421	1.000		
		Sig. (2-tailed)	.000	.	.		
		N	40	40	40		
	Mobile Loans	Correlation Coefficient	.729**	.269	.169	1.000	
		Sig. (2-tailed)	.000	.000	.000	.	
		N	40	40	40	40	
	Agency Banking	Correlation Coefficient	.689**	.266	.366	.359	1.000
		Sig. (2-tailed)	.000	.000	.000	.000	.
		N	40	40	40	40	40

**. Correlation is significant at the 0.01 level (2-tailed).

4.5 Regression Analysis

The cause-and-effect relationship between the predictor variables and response variable was evaluated using a multiple linear regression model. The data did not meet all the First-Order conditions to conducting linear regression. Because all the data series employed in the study was serially auto correlated, lagged transformation was applied to the predictor variables as a remedy for autocorrelation.

The regression analysis adopted a 5% significance level. The significance critical value exhibited from the Analysis of Variance (ANOVA) was compared with the critical value obtained in the analysis (α=0.05). Additionally, the F-Value obtained in the study was compared against the critical value. The significance critical value exhibited from the model coefficients was compared with the critical value obtained in the analysis (α=0.05). Furthermore, the F statistic obtained in the study for each model coefficient was compared against the two-tailed critical value. When the various aspects of mobile money transfer were regressed against the financial deepening in Table 4.6 through to Table 4.8 it resulted as follows;

4.5.1 Regression Summary

The regression summary indicates the coefficient of determination that is vital in determining the effectiveness of the model in predicting future changes in the dependent variable.

Table 4. 6: Model Summary

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.891[a]	.794	.771	.0416989

a. Predictors: (Constant), Zscore: Agency Banking, Zscore: Mobile Loans, Zscore: Mobile Banking, Zscore: Internet Banking

b. Dependent Variable: Y = Financial Deepening

Table 4.6 indicate the R square (R^2) of the study is 0.794 indicating that mobile transfer is able to explain changes in financial deepening to a tune of 79.4%. The model does not explain only 20.6% of the changes in financial deepening which is explained by other factors outside the model.

4.5.2 Analysis of Variance

Analysis of variance is undertaken where F test is undertaken to determine the significance of the effect of mobile transfer on financial deepening. A significance of less than 0.05 indicates that the null hypothesis is rejected and therefore there is significant effect of mobile transfer on financial deepening as indicated in table 4.7.

Table 4. 7: ANOVA TABLE

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.235	4	.059	33.802	.000[b]
	Residual	.061	35	.002		
	Total	.296	39			

a. Dependent Variable: Y = Financial Deepening

b. Predictors: (Constant), Zscore: Agency Banking, Zscore: Mobile Loans, Zscore: Mobile Banking, Zscore: Internet Banking

4.5.3 Regression Coefficient

The regression coefficient expresses the extent to which changes in one independent variable would affect the dependent variable when all other factors are held constant.

Table 4. 8: Coefficients Table

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.445	.007		219.176	.000
	Zscore: Internet Banking	.194	.085	2.225	2.292	.028
	Zscore: Mobile Banking	.199	.051	-2.284	-3.920	.000
	Zscore: Mobile Loans	-.042	.035	-.486	-1.218	.232
	Zscore: Agency Banking	-.030	.030	-.340	-.995	.327

a. Dependent Variable: Y = Financial Deepening

The null hypothesis was that there was no significant relationship between each of the liquidity components and financial deepening. The study findings exhibited that internet banking had a significant relationship with financial deepening and growth. This is because the significance value was less than the critical significance value (α) of 0.05. Additionally, the t value obtained for the coefficient did not lie within the range of the t two-tailed test critical value of ±2.04523 obtained in the study. Thus, the null hypothesis is rejected. Mobile banking, mobile loans, and agency banking however do not have significant effects on Financial Deepening. This is because their significance values are greater than the critical significance value (α) of 0.05. In addition, the t values obtained for the coefficients did were within the range of the t two-tailed test critical value of ±2.04523 obtained in the study. The following model was thus developed.

$$\mathbf{Y = 1.445 + 0.194X_1 + 0.199\ X_2 - 0.042\ X_3 - 0.03\ X_4 + 0.007}$$

Where;

Y = Financial Deepening

X_1 = mobile money transfer

This implies that when there is no internet banking, the financial deepening is 1.45. Subsequently, when internet banking increases by one unit, there is a decrease in financial deepening by 0.2 units.

4.4 Interpretation and Discussion of Findings

The study endeavored to assess the effect of Mobile Money Transfer on the financial deepening of licensed commercial banks in Kenya. In addition, the study specifically aimed

to determine the effect of internet banking, mobile banking, mobile loans, and agency banking, on financial deepening of licensed Kenyan commercial banks. The data did not meet all the First-Order conditions to conducting linear regression. The data series of internet banking, mobile banking, and mobile loans did not meet the condition of multicollinearity. The entire data series utilized in the study did not meet the conditions of lack of presence of autocorrelation. The variables that did not meet the conditions of normality and multicollinearity were standardized as a remedy for rectifying both normality and multicollinearity. Because all the data series employed in the study was serially auto correlated, lagged transformation was applied to the predictor variables as a remedy for autocorrelation.

The study findings established that the mobile money transfer components that include; internet banking, mobile banking, mobile loans, and agency banking, are not significantly correlated at the 5% significance level to financial deepening. Finally, the study findings also exhibited that only internet banking had a significant effect on financial deepening. It had a negative relationship with liquidity.

The study finding that Mobile Money Transfer significantly impacts on financial deepening is congruent to the Financial Intermediation theory advocated by Merton (1995), which posits that banks should leverage on technology and innovation to offer the financial services at reasonable costs, more efficiently and conveniently, hence attaining operational efficiency. The study finding is also in tandem with the assertion by KPMG (2017) that the outcomes of the new techniques results in lower costs of financial intermediation and product improvements for the consumers. The study findings are also similar to the proposition by (Venkatesh & Davis, 2000) that mobile money transfers results to cost effective operations.

The study finding is also congruent to the statement by Schumpeter (1939) that any change that has economic impact revolves around entrepreneurial activities, power of markets and innovation and banks should take advantage of Mobile Money Transfer and ensure they create a hedge over other banks by use of innovative products and services hence being competitive and consequently impacting on their cost efficiency. The study finding is in sync with the findings of a study conducted by Kozak (2005), which studied the impact of the evolution in IT on the cost effectiveness and profitability of the banking sector between 1992 and 2003 and revealed an optimistic association between IT and operational costs.

However, the study finding is not congruent to the study findings in a study conducted by Egland, Nolle, Robertson and Furst (1998), which evaluated the number of banks in the US offering electronic banking and explored these bank's structure and financial deepening. The findings revealed no significant differences in the financial deepening between the banks that offered electronic banking services and those that did not in terms of credit quality, efficiency and profitability.

The study finding that internet banking has a significant negative relationship with financial deepening is contradictory to the assertion by Mozie, Mustapha, and Ghazali, (2012) that the use of internet banking is associated with various benefits which include; reduced costs of transacting business and some of the benefits accruing to bank customers include; reduced costs of opening and use of bank services.

The study finding that mobile lending has neither a significant effect nor association with financial deepening is not congruent to the findings of the study conducted by Kigen (2010), which was a survey assessing the effect of mobile banking on transaction costs of 2008

microfinance entities in Kenya between 2008 and 2010. The findings were that mobile banking improved financial deepening.

The study finding that mobile lending has neither a significant effect nor association with financial deepening is not congruent to the statement by Omondi (2015) that many commercial banks have adopted the mobile lending model and the aim of this is to enhance the delivery of the services minimizing the costs of operations in terms of paper work.

The study finding that agency banking neither has a significant association nor relationship with financial deepening is not parallel to the findings of the study conducted by Gardeva and Rhynea (2011), which studied the opportunities and hurdles to financial inclusion and established that branching costs and product cost-structures were ranked 12^{th} and 7th respectively as major hurdles to financial inclusion by the service providers. The study further established that agency banking reduces the costs of setting physical contact points with customers enabling banks and other financial institutions to reach out to a wider customer base. The study finding is also not in tandem to the study finding in a study conducted by Aduda, Ndwiga and Kiragu (2013), which was a survey on the way agency banking associates with the financial aspects of financial institutions' deepening. The study concluded that agency banking is expanding leading to increased financial deepening in the banks that have adopted the model as a result of convenience and low transaction costs.

The study finding is also dissimilar to the findings of the study conducted by Mwando (2013), which investigated the contribution of agency banking the financial sector. The study established that the low transaction costs associated with agency banking positively influenced the financial deepening of Kenyan commercial banks. The study conclusions were

that with greater market share, as a result of agency banking, the commercial banks were able to enhance their operational efficiency and effectiveness.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This section shows the study findings summary, offered conclusions and recommendations on the relationship between financial technologies on the financial deepening of licensed commercial banks in Kenya. Additionally, the research limitations and further research suggestions are also outlined.

5.2 Summary of Findings

The study endeavored to assess the relationship between Mobile Money Transfers and the financial deepening of licensed commercial banks in Kenya. The study also sought to establish the effect of each individual mobile money transfer component that entailed; internet banking, mobile banking, mobile loans, and agency banking, on financial deepening of licensed Kenyan commercial banks. The study employed the use of correlation and multiple linear regression analyses.

The correlation analysis employed in the study established that the mobile money transfer components that include; internet banking, mobile banking, mobile loans, and agency banking are not significantly correlated at the 5% significance level to the financial deepening of licensed Kenyan commercial banks.

The multiple linear regression analysis revealed that Mobile Money Transfer significantly impacts on financial deepening. Therefore, Mobile Money Transfer can be utilized to significantly predict the financial deepening of commercial banks. Further findings were that the only mobile money transfer component that significantly impacted on financial deepening of Kenyan commercial banks was internet banking which had a significant negative relationship with the financial deepening of Kenyan commercial banks. The rest of the mobile

money components that entailed; mobile banking, mobile loans, and agency banking, did not individually significantly impact on the financial deepening of Kenyan commercial banks.

5.3 Conclusion

In this section, the conclusion of the study is given; the conclusion is affiliated to the study objective, which was to assess the relationship between the relationship Mobile Money Transfer and the financial deepening of licensed commercial banks in Kenya. Other specific objectives were to establish the effect of each individual mobile money component that entailed; internet banking, mobile banking, mobile loans, and agency banking, on financial deepening of licensed Kenyan commercial banks.

The study concluded that Mobile Money Transfer does significantly impact on financial deepening, and therefore, it cannot be utilized to significantly predict financial deepening. The study further concluded that that the only mobile money transfers component that significantly impacted on financial deepening was internet banking which had a significant negative relationship with the financial deepening. The rest of the mobile money transfers components that entailed; mobile banking, mobile loans, and agency banking, did not individually significantly impact on the financial deepening.

The study conclusion that Mobile Money Transfer does significantly impact on financial deepening is in tandem with the Financial Intermediation theory advocated by Merton (1995), which posits that banks should leverage on technology and innovation to offer the financial services at reasonable costs, more efficiently and conveniently, hence attaining operational efficiency. The study conclusion is also in tandem with the assertion by KPMG (2017) that the outcomes of the new techniques results in lower costs of financial intermediation and product improvements for the consumers. Finally, the study conclusion is also similar to the

proposition by (Venkatesh & Davis, 2000) that mobile money transfers results to cost effective operations.

The study conclusion that the only mobile money transfers component that significantly impacted on financial deepening was internet banking which had a significant negative relationship with the financial deepening contradicts the assertion by Mozie, Mustapha, and Ghazali, (2012) that the use of internet banking is associated with various benefits which include; reduced costs of transacting business and some of the benefits accruing to bank customers include; reduced costs of opening and use of bank services.

5.4 Recommendations

The study findings will aid in further researches to be conducted on the field of the relations between Mobile Money Transfer and financial deepening. Later scholars keen in research on relations between Mobile Money Transfer and financial deepening will use the study findings as referral. Policy recommendations are made to the National Treasury and CBK that since it has been established that Mobile Money Transfer does significantly impact on financial deepening and thus it can be utilized to significantly predict the financial deepening of Kenyan commercial bank, the policy makers should direct commercial banks, and by extension other financial institutions, to employ Mobile Money Transfer so as to enhance cost efficiency and consequently financial deepening of the financial institutions. The recommendation will guide government regulators in making policies and practices to boost the financial system and mitigate collapse of banks.

The finding that Mobile Money Transfer does significantly impact on financial deepening will guide the commercial bank practitioners, and by extension other financial institutions practitioners and consultants to implement and improve on Mobile Money Transfer enhancement in order to augment the financial institutions' financial deepening. The study

finding that the only mobile money transfers component that significantly impacted on financial deepening was internet banking prompts recommendations to the commercial bank practitioners and by extension other financial institutions practitioners and consultants, to concentrate mainly on internet banking in order to augment the financial institutions' financial deepening. However, the finding that internet banking had a significant negative relationship with the financial deepening needs further investigation because most of the empirical literature sights a positive relationship between the two variables.

5.5 Recommendations for Further Study

Exploring the relations between Mobile Money Transfer and financial deepening is of great importance the policy makers in the National Treasury and CBK, the practitioners in the banking sector, and consultants Capital Markets. However, the current study was carried out in the commercial banks' context, particularly for sharia compliant banks, the same study could be carried out across other financial institutions to establish if the study findings would hold. The study was only carried out in the Kenyan context, further studies can be conducted out of Kenyan context, they can be conducted in the African or global jurisdictions to establish whether the study findings would hold.

The study only considered the mobile money transfers components that entailed; internet banking, mobile banking, mobile loans, and agency banking as influencing financial deepening. A study can be conducted to ascertain if there are other factors that influence financial deepening. Additionally, further studies can be conducted to ascertain if there are factors that moderate on the relationship Mobile Money Transfer and financial deepening. This study used secondary data, a subsequent research should be undertaken applying primary data to ascertain if the study findings would hold and either complement or criticize the finding of this study. Multiple linear regression and correlation analysis were applied in the

study; other analysis technique for example cluster analysis, discriminant analysis, granger causality and factors should be incorporated in the subsequent researches.

5.6 Limitations of the Study

The study was conducted only in the Kenyan commercial banks' context, particularly on sharia compliant commercial banks, due to time and cost constraints, which does not give clear indication of findings if other financial institutions were also incorporated in the study. More uncertainties would occur if similar studies were replicated in different financial institutions and countries. The study periods was limited to ten years due to time and cost limitations, other studies can be done extending the study period to establish if the study findings would hold. Although the research engaged secondary sources of data, there were some major challenges like some of the data being not readily available; especially data on Mobile Money Transfer and it took great lengths and costs to obtain it. The data was not utilized in their raw form and further calculations and manipulations of the data were required. Impending delays were experienced due to data processing and further editing before the compilation by the researcher.

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APPENDICES

1.2

1.3 Appendix 1: List of Commercial Banks in Kenya as at 29th February, 2020

1. Absa Bank Limited
2. African Banking Corp. Ltd
3. Bank of Africa Kenya Ltd
4. Bank of India
5. Bank of Baroda (K) Ltd
6. Stanbic Bank Ltd
7. Chase Bank (K) Ltd (In Receivership)
8. Citibank N.A.
9. Consolidated Bank of Kenya Ltd
10. Co-operative Bank of Kenya Ltd
11. Credit Bank Ltd
12. Development Bank (K) Ltd
13. Diamond Trust Bank (K) Ltd
14. Dubai Bank Ltd (In Receivership)
15. Dubai Islamic Bank (Kenya) Ltd
16. Ecobank Limited
17. Spire Bank
18. Equity Bank Ltd
19. Family Bank Ltd
20. Guaranty Trust Bank
21. First Community Bank Ltd

22. Guardian Bank Ltd
22. Gulf African Bank Ltd
24. Habib Bank A.G. Zurich
25. HFC Ltd
26. Imperial Bank Ltd (In Receivership)
27. I & M Bank Ltd
28. Jamii Bora Bank Ltd
29. KCB Bank Kenya Ltd
30. Mayfair Bank Ltd
31. Middle East Bank (K) Ltd
32. M Oriental Bank Ltd
33. National Bank of Kenya Ltd
34. NCBA Bank Kenya
35. Paramount Universal Bank Ltd
36. Prime Bank Ltd
37. Sidian Bank
38. Standard Chartered Bank (K) Ltd
39. SBM Bank (Kenya) Ltd
40. Transnational Bank Ltd
41. UBA Kenya Bank Ltd
42. Victoria Commercial bank Ltd

Source: Kenya Bankers Association Website (2020)

1.4 Appendix II: Research Data

Year	Quarter	Total Income	Total Expenses	Internet Banking	Mobile Banking (bn)	Agency Banking	Mobile Lending		Y=Financial Deepening	Internet Banking	Mobile Banking	Agency Banking	Mobile Lending
2011	Q1	181357.5	105739	39.5215	90.4	36.48	15.46175		1.715143	1.596833	1.956168	1.562055	1.189259
	Q2	206350	126120	44.863	93.8	39.242	18.6815		1.63614	1.651888	1.972203	1.593751	1.271412
	Q3	231342.5	146501	50.2045	103.2	40.514	21.90125		1.579119	1.700743	2.01368	1.607605	1.340469
	Q4	256335	166882	55.546	112.6	43.612	25.121		1.536025	1.744653	2.051538	1.639606	1.400037
2012	Q1	281327.5	187263	60.8875	122	81.659	28.34075		1.502312	1.784528	2.08636	1.912004	1.452411
	Q2	306320	207644	66.229	131.4	119.706	31.5605		1.475217	1.821048	2.118595	2.078116	1.499144
	Q3	331312.5	228025	71.5705	140.8	157.753	34.78025		1.452966	1.854734	2.148603	2.197978	1.541333
	Q4	356305	248406	76.912	150.2	195.8	38		1.434366	1.885994	2.17667	2.291813	1.579784
2013	Q1	357773	245408.5	82.99925	157.8	205.904	39.014		1.457867	1.919074	2.198107	2.313665	1.59122
	Q2	359241	242411	89.0865	165.4	216.008	40.028		1.48195	1.949812	2.218536	2.33447	1.602364
	Q3	360709	239413.5	95.17375	173	226.112	41.042		1.506636	1.978517	2.238046	2.354324	1.613229
	Q4	362177	236416	101.261	180.6	236.216	42.056		1.531948	2.005442	2.256718	2.373309	1.623828
2014	Q1	376307.3	246700	105.341	191.8	263.587	46.04075		1.525364	2.022597	2.282849	2.420924	1.663142

	Q2	390437.5	256984	109.421	203	290.958	50.0255		1.519307	2.039101	2.307496	2.46383	1.699191
	Q3	404567.8	267268	113.501	214.2	318.329	54.01025		1.513716	2.055	2.330819	2.502876	1.732476
	Q4	418698	277552	117.581	225.4	345.7	57.995		1.508539	2.070337	2.352954	2.538699	1.763391
2015	Q1	432737.5	293649	121.6045	235.5	369.825	53.64425		1.473656	2.08495	2.371991	2.567996	1.729523
	Q2	446777	309746	125.628	245.6	393.95	49.2935		1.442398	2.099086	2.390228	2.595441	1.69279
	Q3	460816.5	325843	129.6515	255.7	418.075	44.94275		1.414229	2.112778	2.407731	2.621254	1.65266
	Q4	474856	341940	133.675	265.8	442.2	40.592		1.388711	2.12605	2.424555	2.645619	1.60844
2016	Q1	481634	345177.5	135.5095	273.7	515.2	43.90225		1.395323	2.13197	2.437275	2.711976	1.642487
	Q2	488412	348415	137.344	281.6	588.2	47.2125		1.401811	2.13781	2.449633	2.769525	1.674057
	Q3	495190	351652.5	139.1785	289.5	661.2	50.52275		1.40818	2.143572	2.461649	2.820333	1.703487
	Q4	501968	354890	141.013	297.4	734.2	53.833		1.414433	2.149259	2.473341	2.865814	1.731049
2017	Q1	498055	354447.8	151.3778	306.2	819.355	66.13475		1.405158	2.180062	2.486005	2.913472	1.82043
	Q2	494142	354005.5	161.7425	315	904.51	78.4365		1.39586	2.208824	2.498311	2.956413	1.894518
	Q3	490229	353563.3	172.1073	323.8	989.665	90.73825		1.386538	2.235799	2.510277	2.995488	1.95779
	Q4	486316	353121	182.472	332.6	1074.82	103.04		1.377194	2.261196	2.521922	3.031336	2.013006
2018	Q1	493100.5	355029.3	192.8368	341.4	1103.197	107.685		1.388901	2.28519	2.533264	3.042653	2.032155

	Q2	499885	356937.5	203.2015	350.2	1131.574	112.33		1.400483	2.307927	2.544316	3.053683	2.050496
	Q3	506669.5	358845.8	213.5663	359	1159.95	116.975		1.411942	2.329533	2.555094	3.064439	2.068093
	Q4	513454	360754	223.931	367.8	1188.327	121.62		1.42328	2.350114	2.565612	3.074936	2.085005
2019	Q1	519417.3	365124.5	223.9753	371.575	1196.3	126.0083		1.422576	2.3502	2.570046	3.07784	2.100399
	Q2	525380.5	369495	224.0195	375.35	1204.273	130.3965		1.421888	2.350286	2.574436	3.080725	2.115266
	Q3	531343.8	373865.5	224.0638	379.125	1212.246	134.7848		1.421216	2.350372	2.578782	3.083591	2.129641
	Q4	537307	378236	224.108	382.9	1220.218	139.173		1.42056	2.350457	2.583085	3.086438	2.143555
2020	Q1	547091.8	399752	238.8133	438.6	1183.631	156.841		1.368578	2.378058	2.642069	3.073216	2.19546
	Q2	556876.5	421268	253.5185	494.3	1147.043	174.509		1.321906	2.40401	2.693991	3.05958	2.241818
	Q3	566661.3	442784	268.2238	550	1110.456	192.177		1.279769	2.428497	2.740363	3.045501	2.283701
	Q4	576446	464300	282.929	605.7	1073.868	209.845		1.241538	2.451677	2.782258	3.030951	2.321899