https://doi.org/10.51483/IJDSBDA.2.2.2022.1-10 ISSN: 2710-2599

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Publisher's Home Page: https: / / www.svedbergopen.com /

Research Paper **Open Access**

Effect of FinTech Services on Financial Inclusion in Kenya

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Article Info

Volume 2, Issue 2, November 2022
Received : 22 July 2022
Accepted : 19 October 2022
Published : 05 November 2022
doi: 10.51483/IJDSBDA.2.2.2022.1-10

Abstract

This study investigates how FinTech services have affected Financial Inclusion in Kenya based on FinTech and financial inclusion data from audited individual Company financial statements and the Central Bank of Kenya. The general objective of the study was to investigate the effects of the credit-oriented, savings-oriented and transactional-oriented FinTech services on financial inclusion in Kenya. The quick acceptance of FinTech in Kenya, coupled with the mobile banking platforms already in place, has proven the possibility of opening up opportunities for Kenyans, giving them more credit and savings and transactional access options with these kinds of technologies. The study used descriptive design method and used secondary data gathered from annual reports and financial statements of regulated banks and the World Bank on various financial inclusion parameters. Inferential and descriptive statistics methods including Pearson's correlation and regression analysis were used to interpret and analyze the data. The findings show that there is a positive link between the FinTech transactional services, FinTech savings services, and financial inclusion. However, they show a negative correlation between FinTech credit services and financial inclusion. The researcher urges the Central Bank of Kenya to enhance the (Digital Credit Providers) Regulations released in March 2022 and regulate terms of credit product offerings that are currently a bottleneck towards achieving financial inclusion.

Keywords: *Financial Inclusion, FinTech, FinTech services, Kenya*

1. Introduction

'FinTech' is the technology in finance that is changing the banking behavior of stakeholders in doing financial transactions (Abdul, 2019). Financial Technology ('FinTech') has the potential to disrupt and completely change the way users do their everyday activities: payments, credit, insurance, financial compliance services (RegTech). FinTech refers to the collaboration of innovative business process models with technology to disrupt, change, or enhance financial products and services (Rafay, 2018).

FinTech services in developed countries are focused on online customers, while those in developing economies focused on the broader cell phone users' population (Demirguc-Kunt *et al.*, 2018). Kenya has stood

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out as a FinTech hub amongst African countries primarily due to the achievements in the telecommunication sector, particularly the notable success of the money transfer technology, M-Pesa. Motivated by M-Pesa, many other companies with disruptive digital financial services and products have emerged in Kenya.

The suitably conducive environment created by M-Pesa and the inadequate coverage of the incumbent financial institutions laid the perfect foundation for FinTech to blossom. Financial inclusion is the state in which all adults (even those excluded by the financial system) have access to savings, credit, payments, and insurance services from formal financial institutions (GPFI, 2016). FinTechs facilitate people who are financially excluded from utilizing previously unavailable financial services and products (Gabor and Brooks, 2017).

2. Problem Statement

Recent developments in technology have spurred a rise in the FinTech sector, which leverages new digital technologies like the blockchain and data analytics to enhance automation of the delivery chain in financial services to the end user (Lynn *et al.*, 2019). However, the research on FinTech and their role in financial inclusion is not yet widely explored. Kenya is not only establishing itself as a global financial hub but also benefiting its population by growing slowly towards inclusion, thus presenting a favorable empirical environment to explore the subject. Several researchers have published their work on the relationship between mobile banking and financial inclusion. Etim researched the impact of mobile banking and its adoption on financial inclusion in the population in Nigeria. According to his research, the adoption of mobile banking and mobile banking contributed to the success of financial inclusion in Nigeria (Etim, 2014). Even more research was done by Mago and Chitokwindo (2014) on the impact of mobile banking on financial inclusion in Masvingo Province, Zimbabwe. The researcher concluded poor people were ready to embrace banking on mobile platforms because it is readily available, appropriate, inexpensive, user-friendly, and safe because they would do it.

Ngugi (2015) did a study in Kenya and researched the impact of mobile banking on financial inclusion and established that services offering banking on mobile technology contributed to financial deepening. However, a study has not been done on the impact of FinTech services provided by products like Timiza, M-Shwari, KCB-MPESA etc., on financial inclusion in Kenya.

3. Research Objectives

The general objective of the research is to study the effect of FinTech services on financial inclusion in Kenya. The specific objectives are:

1. To investigate the effect of credit FinTech services on financial inclusion in Kenya.
2. To investigate the effect of savings FinTech services on financial inclusion in Kenya.
3. To investigate the effect of transactional FinTech services on financial inclusion in Kenya.

4. Significance of the Study

Various stakeholders will benefit from the lessons and recommendations of this research. The government for example, through its agencies and parastatals like the CBK, the Communication Authority of Kenya, the Kenya Bureau of Statistics and other unnamed policymakers will utilize the useful information to approach and develop more effective policies to drive the much needed improvement in the telecommunications and financial services sector. The government and its regulators are likely to benefit as the study sheds light on gaps in policy development which can be sealed to boost financial inclusion in the overall Kenyan population.

This study equips scholars with a wealth of knowledge in this realm as they research and also suggests additional research areas and improvement scopes to be investigated in later studies. Researchers and Academicians in the financial and economics segments will benefit from this paper once uploaded and published in the official repositories and libraries in the public domain and open-access journals. The gaps identified by this study form a basis for further exploration to add value to the subject area. The study contributes to the literature on FinTechs and financial inclusion. The theoretical perception of the relationship between FinTech services and financial inclusion has been positive based on the presumption that more access to the internet and smart devices improves access to finance. However, in some markets, the World Bank has reported negative effects of some of these FinTech services due to the profit maximization behaviors of service providers (Ozili, 2018). This is yet to be ascertained in Kenya.

5. Research Methodology

5.1. Research Design

In terms of the research design, an approach consisting of a secondary data review was adopted based on a census. Using this method when studying complex issues allows the researcher to uncover richer data (De Lisle, 2011). In addition, the study adopts a descriptive design approach. Descriptive studies are done in this investigative study so that the researcher can be able to obtain information, summarize it, present it, and explore its meaning to give a detailed analysis (Creswell, 2014). Descriptive design is best used when gathering information about people's attitude, behaviors and sentiments (Guest, 2013). The researcher decided to use a descriptive research design to guide the exploration of data on the study variables.

5.2. Population

The target population was made up of all the banks licensed in Kenya as at December 31, 2021. The population for the study was made up of quarterly data points per variable compiled from the 39 regulated banks in Kenya, according to the CBK (2021) annual report for the end of the 2021 financial year. The data points were 42-44 per variable because some banks had more than one FinTech product.

5.3. Data Analysis and Presentation

Descriptive statistics and inferential statistics were used to examine and interrogate the information collected. Descriptively, the data was analyzed using trend analysis for the period 2007 to 2021, with a focus on the variables under study. A causal association was drawn between the FinTech services and financial inclusion using Pearson's correlation and regression analysis methods. Moreover, the relationships above were drawn using IBM's Statistical Package for Social sciences based on the regression and correlation analysis functionality between the dependent variable (financial inclusion) and each independent variable.

The strength of the influence the independent variables had on financial inclusion was established using Pearson's correlation methodology. ANOVA (Analysis of Variance), the fitness of the model (*R* Square), and regression of coefficients illustrated the trends and explanations for the data relationships. Figurative and tabular formats were used to present the data while the fitness of the model was investigated using SPSS. Analysis of variance was done to account for the overall significance of the model in the research study.

In particular, the following regression model was used.

$$Y = \alpha + \beta_c X_c + \beta_s X_s + \beta_t X_t + \mu$$

where

X_c = Natural unit of the quotient of value of FinTech credit services transactions divided by number of FinTech credit services transactions.

X_s = Natural unit of quotient of value of FinTech savings services transactions divided by the number of savings FinTech services transactions.

X_t = Natural unit of of quotient of value of FinTech transactions divided by the number of FinTech services transactions .

Y = Financial Inclusion – Accessibility to formal financial services quantified in terms of the number of deposit bank accounts per 1000 people in the adult population as per the Central Bank of Kenya .

Where the following are defined:

α = Constant

μ = Error term

$\beta_c, \beta_s, \beta_t$ = Beta coefficients

6. Findings, Presentation and Discussion

From the findings, 2007 recorded the least number of FinTech transactions of 5.47 million transactions with 2021 recording the highest, 3.309 trillion transactions. For the number of FinTech transactions, the arithmetic mean was 1.16 billion. The standard deviation of these FinTech transactions was 1 billion transactions.

The researcher then explored the descriptive statistics for the value of FinTech transactions from 2007 to 2021. 2007 had the least value of FinTech transactions at 16.32 billion transactions while 2021 recorded the highest value of transactions at 11.19 trillion. For the value of FinTech transactions, their arithmetic mean was 3.08 trillion. The FinTech transactions have a standard deviation of 3.03 trillion. On the other hand, the value of savings and credit transactions trailed that of other transfer transactions.

There were no credit transactions till 2011, with the inception of the M-Pesa platform, which had the least value of credit FinTech transactions of 3.29 billion. The year 2021 recorded the highest value of 1.83 trillion, in line with the population and subscriber growth. The trend is very similar to savings too, in the sense that there were no savings transactions till 2011, which had the least value of credit FinTech transactions of 3.92 billion, with 2021 recording the highest value of 1.04 trillion.

6.1. Proportion of FinTech Services Relative to the Total Number and Value of Transactions

We explored the data to establish the contribution of FinTech services vs. legacy banking services (agency, ATM, branches etc.) to the total transactional, credit and savings transaction services. See the figures below illustrating the findings.

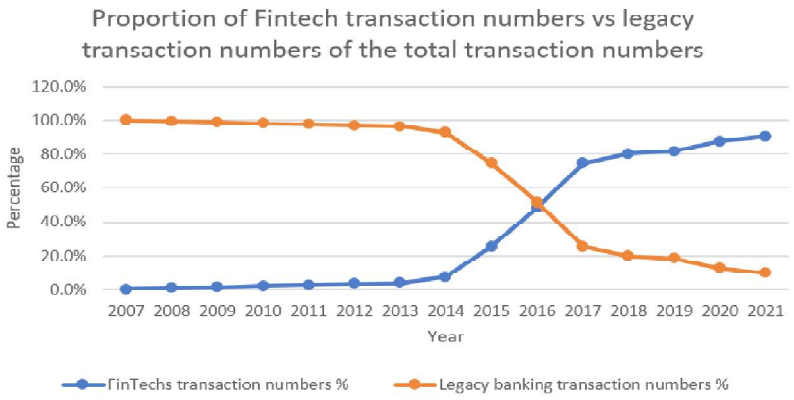

Figure 1: Proportion of FinTech Transaction Numbers vs. Legacy Transaction Numbers of the Total Transaction Numbers

According to Figure 1, the FinTech transaction services have grown in transaction numbers from 2007 where they were less dominant to about 90% of the transactions in 2021.

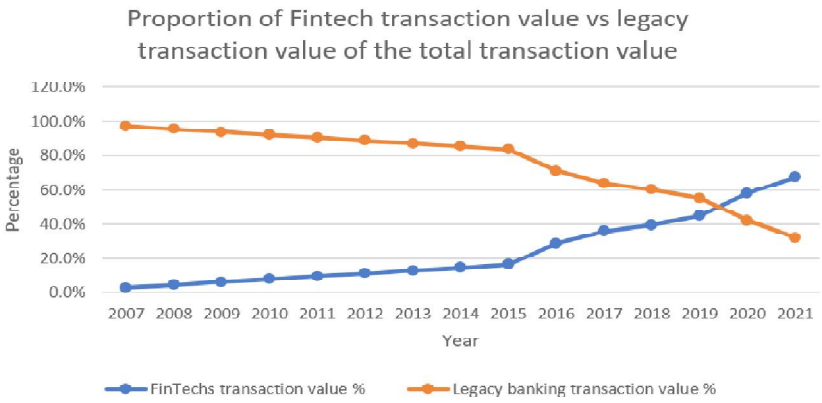

Figure 2: Proportion of FinTech Transaction Value vs. Legacy Transaction Value of the Total Transaction Value

Figure 2 shows that FinTech transaction services have grown in transaction value from 2007 where they were less dominant to slightly over 65% of the total transaction value in 2021.

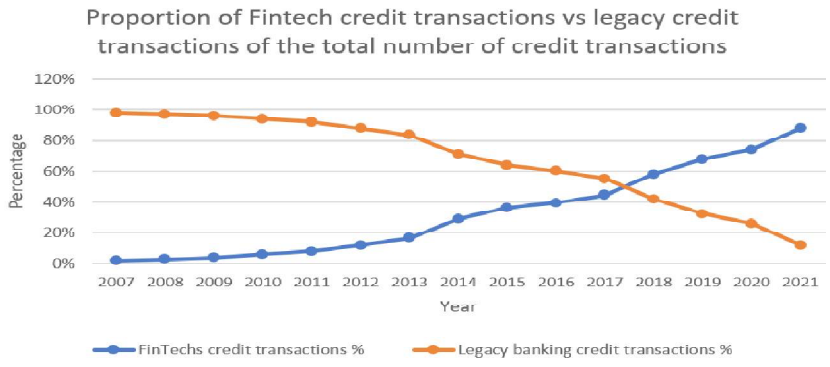

Figure 3: Proportion of FinTech Credit Transactions vs. Legacy Credit Transactions of the Total Number of Credit Transactions

The number of FinTech credit transactions has increased from 2007 to surpass the legacy banking transactions as illustrated by Figure 3. 88% of banking transactions are done using FinTech outfits in the banks.

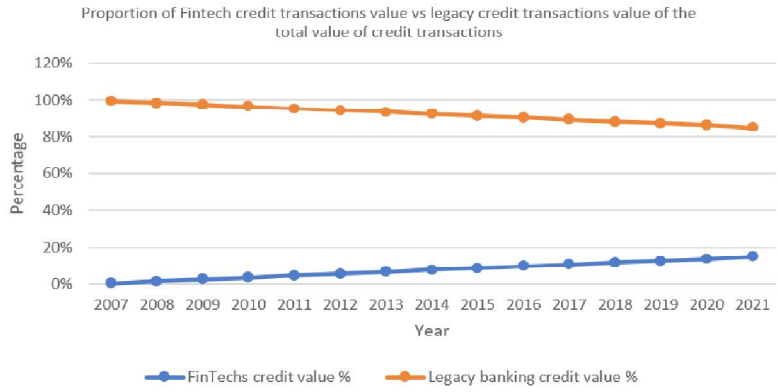

Figure 4: Proportion of FinTech Credit Transactions Value vs. Legacy Credit Transactions Value of the Total Value of Credit Transactions

The value of FinTech credit transactions has increased from 2007 to 2021, according to Figure 4. However, in as much as these have eaten into the legacy banking transactions value, their value is still lower. 85% of the value of credit banking transactions are done using the legacy banking methods.

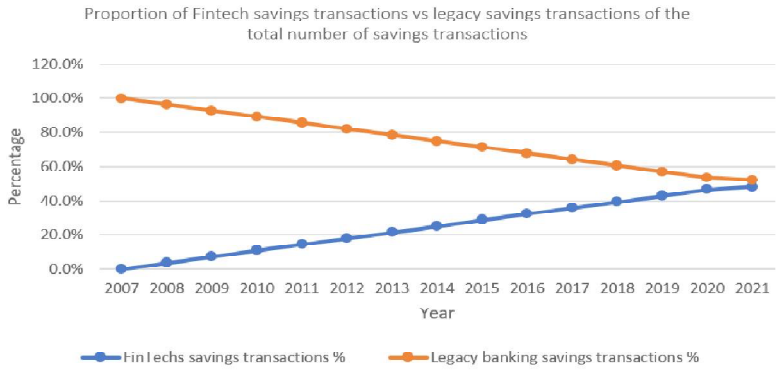

Figure 5: Proportion of FinTech Savings Transactions vs. Legacy Savings Transactions of the Total Number of Savings Transactions

As seen in Figure 5, the number of FinTech savings transactions has increased from 2007 to come very close to the number of legacy banking transactions. 52% of the number of savings banking transactions are done using legacy banking methods.

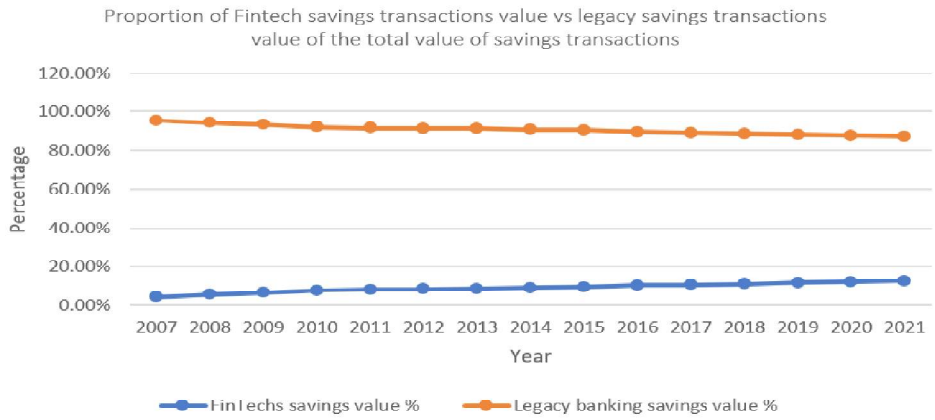

Figure 6: Proportion of FinTech Savings Transactions Value vs. Legacy Savings Transactions Value of the Total Value of Savings Transactions

Figure 6 shows that there has also been a steady increase in the value of FinTech savings transactions from the year 2007 to 2021 compared to the decline in the savings value through the other legacy banking methods. Still, 87% of the value of savings banking transactions are done using legacy banking methods.

7. Pearson's Correlation Analysis

Bivariate correlation indicates the relationship between two variables. The correlation varies from 1 to -1 whereby 1 indicates a strong positive relationship while a -1 on the other end indicates a strong negative relationship. Table 1 shows a presentation of the results.

Table 1: Pearson's Correlation

Correlations		
		FI
Pearson Correlation	FI	1.000
	Unit value of FinTech Transactions/Unit number of FinTech Transaction accounts	0.868
	Unit value of FinTech credit transactions/Unit number of FinTech credit accounts	-0.155
	Unit value of FinTech Savings transactions/Unit number of FinTech savings accounts	0.838

Other than being positive, the correlation relationship between FinTech transaction services and financial inclusion was strong (0.868). The FinTech credit services and financial inclusion were weakly and negatively correlated (0.155) while FinTech savings services and financial inclusion were also strongly and positively (0.838).

8. Fit of Model

Table 2 below illustrates how the regression model fits while bringing forth the relationships between the variables of the study.

Table 2: Fit of Model

Model Summary[b]

Model	*R*	*R* Square	Adjusted *R* Square	Std. Error of the Estimate	Durbin-Watson
1	0.966[a]	0 .933	0.915	0 .0436594092	1.564

Note: [a] Predictors: (Constant), Unit value of FinTech Savings transactions/Unit number of FinTech savings accounts, Unit value of FinTech credit transactions/Unit number of FinTech credit accounts, Unit value of FinTech Transactions/Unit number of FinTech Transaction accounts; and [b] Dependent Variable: FI.

The study results indicate that the independent variables, FinTech transaction services, FinTech credit services, and FinTech savings services, satisfactorily explain financial inclusion. The *R* value in the *R* column, 0.966 implies a high correlation coefficient. This inference is supported by a solid *R* squared of 0.933, indicating how much the independent variables illustrate the total variation in financial inclusion, the dependent variable. This concludes that 93.3% of financial inclusion is predicted by the independent variables, FinTech transaction services, FinTech credit services, and FinTech savings services.

9. Analysis of Variance

To illustrate how well the regression model fits the data, the Analysis of Variance (ANOVA) findings have been presented in Table 3.

Table 3: Analysis of Variance

ANOVA[a]

Model		Sum of Squares	df	Mean Square	*F*	Sig.
1	Regression	.260	3	.087	18.168	.000[b]
	Residual	.052	11	.005		
	Total	**.312**	**14**			

Note: [a] Dependent Variable: FI; [b] Predictors: (Constant), Unit value of FinTech Savings transactions/Unit number of FinTech savings accounts, Unit value of FinTech credit transactions/Unit number of FinTech credit accounts, Unit value of FinTech Transactions/ Unit number of FinTech Transaction accounts

For this study, the model was a good fit for the data and came out as statistically significant. This was supported by a probability (*p*) value of 0.000 as indicated on the "Sig." column. The *p* value from the results turned out to be less than the set conventional *p* value of 0.05. With that significance level, the independent variables statistically and significantly predict the dependent variable. These findings indicate that FinTech transaction services, FinTech credit services, and FinTech savings services are good predictor variables of financial inclusion, the dependent variable.

10. Coefficients

Based on the data in the study, regression coefficient results were presented in Table 4.

The findings of the study indicate a positive relationship between the FinTech transactional services and FinTech savings services and the dependent variable (financial inclusion) based on the respective beta coefficients of 0.516, -0.043 and 0.129. However, they indicate a negative relationship between FinTech credit services and financial inclusion, as evidenced by the negative coefficient of 0.043. The results indicate that if the FinTech transactional services increased by a unit of one unit, subsequently, financial inclusion would increase by 0.516 units.

From the same results, if FinTech credit services value increased by a unit of one unit, this would lead to a decrease in financial inclusion by 0.043 units. An increase in the savings FinTech services by a unit of one unit results in an increase in financial inclusion by 0.129 units.

Table 4: Coefficients

Coefficients[a]								
Model		**Unstandardized Coefficients**		**Standardized Coefficients**			**Collinearity Statistics**	
		B	**Std. Error**	**Beta**	***t***	**Sig.**	**Tolerance**	**VIF**
1	(Constant)	.312	.078		3.998	0.002		
	Unit value of FinTech Transactions/ Unit number of FinTech Transaction accounts	0.516	0.166	0.647	3.117	0.010	0.354	2.826
	Unit value of FinTech credit transactions/ Unit number of FinTech credit accounts	-0.043	0.098	-0.088	-0.434	0.672	0.371	2.693
	Unit value of FinTech Savings transactions/ Unit number of FinTech savings accounts	0.129	0.058	0.411	2.247	0.017	0.457	2.190

From a coefficient significance perspective, the three independent variables FinTech transactional services, FinTech credit services and FinTech savings services have significance levels of 0.010, 0.672 and 0.017. The scientific probability significance level is 0.05 implying that the statistical significance of a variable to be satisfied, it has to have lower than the 0.05 significance target. These regression results affirm that FinTech savings services and FinTech transaction services were essential determinants of financial inclusion. However, FinTech credit services had a significance higher than the 0.05 required hence were not significant determinants of financial inclusion.

The model was as follows:

$$Y = \alpha + \beta_c X_c + \beta_s X_s + \beta_t X_t + \mu$$

where

X_c = Natural unit of value of FinTech credit-oriented transactions divided by number of FinTech credit transactions – number of FinTech credit services transactions.

X_s = Natural unit of value of FinTech savings transactions divided by the number of investment/savings FinTech services transactions – number of transactions done by people who have subscribed to the FinTech savings services.

X_t = Natural unit of value of FinTech transactions divided by the number of FinTech services transactions – number of transactions done by people who have subscribed to the FinTech transaction services.

Y= Financial Inclusion – Accessibility in terms of the number of deposit bank accounts (per 1000 adult population) as per the Central Bank of Kenya. Accessibility and usage of financial services as per the World Bank data 2007-2021. Financial inclusion refers to the extent or depth to which financial products and services are used as determined by frequency, regularity, and duration of their utilization over time.

α = Constant

μ = Error term

β_c, β_s, β_t = Beta coefficients

Overall, the regression model is as follows:

Financial Inclusion (Accessibility and usage of financial services) = 0.312 + 0.516* unit value of FinTech Transactions divided by the number of FinTech Transaction accounts – 0.043* unit value of FinTech credit transactions divided by the number of FinTech credit accounts + 0.129* unit value of FinTech Savings transactions divided by the number of FinTech savings accounts.

11. Discussion of Findings

As a result of the research, there were a number of findings. The year 2007 recorded the least number of FinTech transactions, 5.47 million transactions valued at 16.32 billion while 2021 had the highest, 3.31 billion transactions valued at 11.19 trillion. The arithmetic mean for FinTech transactions was 1.16 billion, with a standard deviation of 1.01 billion transactions. The arithmetic mean for the value of FinTech transactions was 3.08 trillion, with a standard deviation of 3.03 trillion transactions. From the study, a positive coefficient of variation was also established between the Natural unit of the quotient - value of FinTech transactions divided by the number of FinTech services accounts and the dependent variable, financial inclusion as shown by Beta value = 0.516.

From the findings, there were no FinTech credit transactions between the year 2007 and 2010. This period recorded the zero credit FinTech transactions, till 2011 that recorded 395 thousand credit transactions valued at 3.29 billion. The year 2021 recorded the highest, 2.4 billion transactions valued at 1.83 trillion. The arithmetic mean of the value of credit FinTech transactions was 211.04 billion and the standard deviation was 470.91 billion. The research realized a negative coefficient, as evidenced by a beta value of 0.043. This was the unfavorable coefficient of variation between the unit value of credit FinTech transactions divided by the number of credit FinTech services accounts and financial inclusion.

Moreover, from the findings, there were no FinTech savings transactions between the year 2007 and 2010. This period recorded the zero credit FinTech transactions, till 2011 that recorded 395 thousand savings transactions valued at 3.92 billion. The year 2021 recorded the highest, 1.8 billion transactions valued at 1.3 trillion. This indicates a declining trend in savings FinTech transactions. The arithmetic mean of the value of savings / investment FinTech transactions was 347.17 billion and the standard deviation was 489.36 billion. Evidenced by a beta value of 0.129, the study resulted in a positive variation coefficient between the unit value of savings FinTech transactions divided by the number of savings FinTech services accounts and the financial inclusion index.

The research findings are similar to the results arrived at by Ishengoma in 2011, who conducted a study scoped around Kibaha District in Tanzania, investigated banking via mobile phone's system coverage for financial benefits. The study found that volumes of transactions done using mobile platforms were significant contributions to financial inclusion. The study findings also matched those of Mago and Chitokwindo who based their study in Masvingo Province in the year 2014. They investigated the influence of mobile banking on financial inclusion among Zimbabweans and concluded that a favorable relationship exists between the value of mobile transactions and financial inclusion in the population.

12. Conclusion

From the findings of the research, it can be concluded that all independent variables; FinTech credit services, FinTech savings services, and FinTech transactional services satisfactorily explain financial inclusion. It can also be concluded that in getting to know the extent of financial inclusion, it is critical to understand the effect of the unique favorable digital infrastructure and environment geared towards enhancing financial inclusion. Above and beyond, the research has established that FinTech services increase financial inclusion, with the FinTech transaction services taking the lead.

13. Policy Recommendations

The researcher urges the regulator to enhance the policies and regulations around the FinTech space, starting with the prevalent FinTech service providers, especially in the credit and savings product offerings. The

Central Bank of Kenya (Digital Credit Providers) Regulations, 2022 were released in March 2022, but there is a need for training and education of the stakeholders (Central Bank of Kenya (Digital Credit Providers) Regulations 2022 | CBK, 2022). The regulations place an onus on DCPs to carry out due diligence on a customer's ability to repay loans before advancing the same to the customer instead of using profane language and uncouth collection means after default. This will ensure the players are compliant and that the guidelines are clear. Also, the Central Bank also needs to further monitor the liquidity of these digital credit providers as a section of the population will use them for savings products. The CBK should enhance their control over these agencies to ensure they do not use risk mitigating measures to generalize credit provision through blanket blacklisting that might influence penetration of FinTech services.

Through the Central Bank of Kenya, the government should deliberately outline policies that enhance financial inclusion without prohibiting or hindering the autonomy of the players to enable more access to the services. The government should also develop policies that encourage innovations to breed more value into the ecosystem and effectively benefit the end users. The banking regulator should also enhance segmented reporting of the various revenue channels to boost availability of information from registered digital credit providers to sharpen the focus of policy improvements focused on financial inclusion.

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Cite this article as: Eugene Aicha and Oluoch Oluoch (2022). Effect of FinTech Services on Financial Inclusion in Kenya. *International Journal of Data Science and Big Data Analytics,* 2(2), 1-10. doi: 10.51483/IJDSBDA.2.2.2023.1-10.