NEXUS BETWEEN FINANCIAL INCLUSION AND INCLUSIVE GROWTH, THE EAST AFRICA CASE STUDY

John Ndungu

Pan African University- School of Humanities and Social Science, Cameroon

Email: ndungu.johnnganga@yahoo.com

ABSTRACT: *This article empirically investigates the quantitative relationship between financial inclusion and inclusive growth in the East Africa Region. The study employs Driscoll and Kraal's augmented fixed effects estimation technique to analyze data from 2011 to 2021 for five Eastern African Countries. The results show that inclusive growth is positively impacted by financial inclusion. In terms of usage of financial services by gender, on average, a percentage increase in female account ownership and male account ownership will lead to a 0.025% and 0.024% increase in inclusive growth, respectively. The study also found a link between prosperity and inclusive development. This data emphasizes the need for the creation of special agents' tools to provide financial services to the underprivileged and women, as well as the recommendation that financial institutions implement programs to raise adult populations' financial literacy in order to increase access and usage of financial services.*

KEYWORDS: Financial inclusion, Inclusive growth, Poverty, Inequality, East Africa.

INTRODUCTION

Financial services' access has advanced significantly in African nations during the past two decades. There are currently more financial services available to both consumers and businesses, particularly credit. According to Demirguc-Kunt et al. (2017), technology-based services like mobile money have widened financial services access, with payments and savings products being the most widened services. Coetzee and Mulenga (2022) indicated that sub-Saharan Africa, together with South Asia, has the highest rate of account ownership increase between 2011 and 2021 and the quickest rate of account usage growth between 2014 and 2021. Compared to the global growth average of 50%, account ownership doubled from 23% in 2011 to 55% in 2021 in sub-Saharan Africa. Despite this development, Klapper (2017) acknowledges that a majority of adult Africans do not have accounts with banks or other formal financial institutions. Instead, many of them rely on informal borrowing and savings practices like borrowing from friends, family, and unofficial private lenders. The Findex research from 2021 also showed that the sub-Saharan Africa continues to be among the three worst locations in the world for genuine account ownership and usage.

The purpose of this study is thus to determine how financial services and products are used to promote equitable growth in the East African region. As demonstrated by the Africa Development Bank (2019), East Africa has been the continent's fastest-growing economy. The region hosts several burgeoning economies, including Kenya, Rwanda, Tanzania, and Uganda. African Development Bank data further apprised us that the average growth rate for the region was 4.9% in 2018 and 5.3% in 2019, as opposed to 3.3% and 3.4% for all of Africa. During the COVID-19 epidemic, East Africa was the only region in Africa to have escaped a recession throughout the pandemic. Despite this achievement, the region lags behind on matters of inclusive growth. Notably, there is a huge gap between urban and rural areas in terms of utilities like housing, health care, education, power, and water and sanitation, which exacerbates inequality and leaves a sizable portion of the people behind. According to Walker et al. (2022), prior to the COVID-19 outbreak, the average East African nation lagged behind North African and Southern African nations in the fight against inequality by 33% and 30%, respectively.

The East Africa region has the third-highest commitment to reduce inequality, as measured by the Commitment to Reduce Inequality Index (2018). This commitment has been well manifested in the policy facilitation of the adoption of financial technology like M-Pesa, which has a high capacity for reducing the percentage of the excluded and, as a result, promoting economic equality. According to the World Bank population records, Africa's population has been expanding at a rate of 2.42% each year, which is driving up demand for financial services and endangering inequality in the continent. As a result, it is important to consider how much the use of financial services and products promotes equitable growth in East Africa. This study seeks to advance scholarship by determining the extent of financial inclusion in the East African region, exploring the relationship between financial inclusion and inclusive growth, and formulating policy recommendations based on the most recent financial inclusion statistics.

Financial Inclusion and Inclusive Growth

Financial inclusion is intended to help the underprivileged who do not use official financial services, according to Aduda and Kalunda (2012). At least 80% of adults in developing nations lack access to basic financial services, compared to a global average of 50% and 8% for affluent countries (Allen et al., 2014). This represents a significant fraction of the population and

households in the developing world. Even while financial inclusion is critical for driving growth and economic equality, this is still the case. Cull et al. (2012) state that despite the relatively strong returns on investments in emerging countries, growth in such countries is still slow, and poverty and income inequality are still prevalent. This is because of the low rates of financial inclusion in those countries.

According to Ommen (2011), inclusive growth provides the vast majority of the nation's working-age population with chances for gainful employment and lowers poverty. Rao (2009) says inclusive growth pushes the government to invest in disadvantaged groups, small enterprises, and outlying areas; to promote economic dynamism; to construct inclusive labor markets; and to implement innovative policies. It also urges the creation of inclusive institutions and asks for genuinely inclusive and participatory policymaking. Collins et al. (2009) noted in their study that financial inclusion can help to lessen poverty and inequality by facilitating future investments, regulating consumption, and controlling risk. Julie (2013) goes on to note that in order to empower the underprivileged groups, our efforts to promote inclusive growth must also entail providing the poor and vulnerable communities with access to financing.

Theoretical Foundations

The problems of financial inclusion and inclusive growth are discussed in a number of theories. Public good theory and special agent theory are both used in this study.

Public Good Theory

According to the public good principle, formal financial service provision ought to be seen as a public good. The idea is that formal financial services should be made accessible to everyone as a public good for everyone's benefit. Since formal financial services are considered a public good, one person's usage of them has no bearing on other people's access to them. The destitute and the general population can thus be incorporated into the established financial system. This point of view argues that financial inclusion helps the entire population, ensures that no one is left out, and calls for the provision of financial services to all individuals, regardless of their location, level of education, sex, or socioeconomic status. The hypothesis is in line with the rationale that inclusive growth depends on all socioeconomic groups using financial services and goods (Peterson, 2021). According to the argument, the government should help cover the expense of offering formal financial services and actively work to reduce financial exclusion.

Special Agent Theory

The formal financial services should be supplied to excluded persons by special agents, in accordance with the special agent theory of financial inclusion. Offering formal financial services to unbanked individuals can be difficult depending on the characteristics of remote communities, the locals, or the topography. Due to this, professional agents must be hired to offer formal financial services to people of excluded communities (Peterson, 2021). The government, which serves as the principal, is responsible to financial institutions and technology, which operate as special agents. The emergence of digital banking platforms like "Mpesa" in East Africa has had a great impact on the utilization of. This is because the specialty of this product is that it is easy to use and accessible to many. With just a mobile account, one can be able to save money, send money, make payments, transfer money globally, and also use digital overdraft services in "Mpesa" (Ndung'u, 2018). This kind of special agent product has the capacity to bridge the financial exclusion gap as well as promote inclusive growth.

EMPIRICAL LITERATURE

A number of studies have tried to uncover the relationship between financial inclusion and inclusive growth. For instance, Park and Mercado (2018) discovered that a wide variety of people's use of financial services reduced poverty. According to Swamy's (2012) research in India, inclusive growth and sustained economic development depend on the poor having access to financing, which is a requirement for reducing poverty. In China, digital money has helped increase household income, especially in rural areas, according to Xun et al. (2020), who compared the index of digital financial inclusion with data from the China Family Panel Studies. As a result, digital finance has helped China's inclusive growth by closing regional and urban-rural divides.

Bruhn and Love (2014) claim that improved access to financial services increases income for low-income people. Asongu (2015) reveals that mobile phone penetration lowers inequality levels in Africa and the same results were arrived at by Asongu and Nwachukwu (2016).

According to findings from Mohammed et al.'s (2017) treatment effect model and propensity score matching method, those financially included in the lowest wealth quintile benefit more from net wealth and welfare than those who are not financially included. According to evidence gathered by Sarpong and Nketiah (2022), using financial services has a quantitative and perceptible impact on inclusive growth in sub-Saharan Africa. Abor et al. (2018) found that widespread mobile use and financial inclusion both significantly reduce the risk that a household will become impoverished and increase per capita consumption of both food and non-food goods in Ghana. Furthermore, research in Kenya has demonstrated that the introduction of mobile money transfers has enhanced women's economic empowerment in rural regions by making it simpler for women to ask their husbands who have relocated to urban areas for work for remittances (Pickens & Olga, 2009). Access to a wide range of financial services is a key factor in inclusive growth, according to almost all of the literature. Despite this, the underlying theories of the various investigations differ significantly. There is no question that the majority of research is descriptive in character and country-specific, while the few studies that are regional at the level of the entire African continent concentrate on other parts of Africa. Consequently, it is necessary to investigate how the use of financial services and products affects inclusive growth in East Africa.

Methods, Variables, and Sources of Data

This study adopts the Driscoll and Kraay (1998) augmented fixed effects method of estimation to examine the effects of financial inclusion on inclusive growth in the East African sub-region. The data cover the period 2011–2021 across five selected countries in East Africa, comprising the Congo Democratic Republic, Kenya, Rwanda, Tanzania, and Uganda. These countries were selected based on the availability of data on what constitutes financial inclusion and inclusive growth indicators. The dependent variable in this study is inclusive growth, which the researcher measured using a composite index constructed on a weighing system. The study follows the examples of Ramos et al. (2013) as cited in Sarpong and Nketiah- Amponsah (2022) and Khan et al. (2016) by including economic participation as measured by labor force participation rate, human capital investment, and economic growth as measures of inclusive growth. However, this study differs slightly from the existing literature by using the human

development index to capture human capital investment and economic well-being.

Similar to that, the financial inclusion index serves as the main independent variable in this study and is quantified using a weighing method and a created composite index. The variables that make up the financial inclusion index were carefully chosen to reflect the more comprehensive facets of inclusivity and financial inclusion. Debit or credit card ownership, sending or receiving digital payments, saving money at a formal financial institution, making a withdrawal from a formal financial institution, and account ownership at a financial institution or with a mobile money service provider by the income poorest 40% and income richest 60% make up the composite financial inclusion index.

It is worth stating that both the financial inclusion and inclusive growth indexes were constructed using principal component analysis in Stata, which automatically assigns weights to each variable in the index based on its significance.

In addition, the current study separately evaluated the effects of female and male account ownership at a financial institution or mobile money service provider on inclusive growth performance in the East African sub-region in order to capture the gender dimension of financial inclusion. In order to account for their potential confounding effects on inclusive growth in the area, the study additionally included four control variables: trade openness, inflation, domestic lending from banks to the private sector (access to finance), and gross fixed capital creation (domestic investment). The variables, their descriptions, and the data sources are listed in Table 1.

Table 1: Variables, Descriptions, and Data Sources

Inclusive Growth Indicators		
Variable	**Description**	**Source**
HDI	Human Development Index	https://hdr.undp.org/sites/default/files/2021- 22_HDR/HDR21-22_Statistical_Annex_HDI_Table.xlsx
LFPR	Labor force participation rate	https://databank.worldbank.org/source/world-development-indicators

Financial inclusion Indicators		
Variable	**Description**	**Source**
ACC_In4	Account, income poorest 40% (% age 15+)	
ACC_In6	Account, income richest 60% (% age 15+)	
BFFI	Borrowed from a financial institution for business or farm (% age 15+)	https://www.worldbank.org/en/publication/globalfindex

ODCC	Owns a debit or credit card (% age 15+)	
MRDP	Made or received digital payment (% age 15+)	
SFI	Save from a formal financial institution (% age 15+)	
WFI	Made a withdrawal from a formal financial institution (% age 15+)	
Other Variables		
Variable	**Description**	**Source**
ACC_M	Account, male (% age 15+)	https://www.worldbank.org/en/publication/globalfindex
ACC_F	Account, female (% age 15+)	
Trade	Trade (% of GDP)	https://databank.worldbank.org/source/world- development-indicators
DCPS	Domestic credit to the private sector	
GFCF	Gross fixed capital formation (% of GDP)	
INF	Inflation, consumer price index (annual %)	

Source: Author's Compilation

Estimation Strategy

To determine the impact of financial inclusion on inclusive growth in the East African sub-region, this study uses the Driscoll and Kraay (1998) augmented fixed effects estimating technique. This method of estimation was selected based on the model characteristics and the underlying dataset. Based on preliminary tests, the underlying datasets exhibit the presence of autocorrelation and cross-sectional dependence. As such, the static panel models of the pooled ordinary least squares (OLS), random effects, and fixed effects will produce cross-sectionally dependent residuals and undermine the efficiency of the estimated parameters (Hoechle, 2007). Additionally, Driscoll and Kraay (1998) show that by relying on large T asymptotic, as in the case of this study (T > N), the standard nonparametric time series covariance matrix estimator can be modified such that it is robust and consistent with very general forms of cross-sectional and temporal dependence.

The Driscoll and Kraay (1998) augmented fixed effects method of estimation aligns with the standard fixed effects method except that it implements an additional layer to solve cross-sectional dependence, counter heteroskedasticity and autocorrelation, and produce robust estimates. Therefore, the underlying fixed effect model specification is shown in Equation 1 as follows:

$$Y_{it} = \alpha_i + \beta X'_{it} + \varepsilon_{it} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (1)$$

Where Yit is the dependent variable and in this study, the measure of inclusive growth of country i at time t, αi is the cross-country heterogeneous effects, $X'it$ is the vector of independent variables, which could be (financial inclusion index, the disaggregated components of financial inclusion index, domestic credit to the private sector, trade openness, inflation, and gross fixed capital formation), β are the common slope coefficients of the independent variables and $\square_{it}$ is the idiosyncratic disturbance term.

Empirical Results

The descriptive statistics and preliminary tests, including heteroskedasticity and autocorrelation are presented in this part. These findings support the selection of the Driscoll and Kraay (1998) augmented fixed effects estimating technique in this investigation. The results of the given models and the Hausman test, which suggests the use of fixed effects rather than random effects for estimate, are then presented and discussed.

Descriptive Statistics

The factors under consideration in this study were subjected to a descriptive analysis from 2011 to 2021. The study looks at the variables' means, standard deviations, and lowest and maximum values. The average value of the HDI is 0.525, with a standard deviation of 0.038; the mean value of the LFPR is 52.047, with a standard deviation of 31.29; the average value of trade openness is 36.579, with a standard deviation of 23.706. DCPS has a mean of 14.603 with a standard deviation of 9.682; GFCF has a mean of 23.456 with a standard deviation of (9.682); ACC has a mean of 40.728 with a standard deviation of (25.37). WFI has a mean of 56.496 and standard deviation of 12.428. SFI has a mean of 12.593 and standard deviation of 8.079; ACC_M has a mean of 37.908 and standard deviation of 23.167; ACC_F has a mean of 48 and standard deviation of 22.452. ACC_In4 has a mean of 27.789 and standard deviation of 19.649. ACC_In6 has a mean of 48.737 and standard deviation of 26.01. BFFI has a mean of 9.316 and standard deviation of 6.464. ODCC has a mean of 14.842 and standard deviation of 10.787, while MRDP has a mean of 40.143 and standard deviation of 25.413. The lower standard deviations of these variables below their true mean suggest that less variation exists across East African nations in terms of how well they do on these variables. It also suggests that throughout the studied period, East African nations shared similar traits in terms of these variables. The financial inclusion index (FIN), on the one hand, has a mean of 0 and a standard deviation of 1.93; the inclusive growth index, on the other hand, has a mean of 0 and a standard deviation of 1.04; while inflation has a standard deviation of 4.464 and a mean of 4.691. It is evident that the ING, FIN, and inflation standard deviations are significantly higher than their average values, indicating that the performance of East African countries in terms of inclusive growth, financial inclusion, and inflation is highly heterogeneous.in terms of their performance in terms of the levels of inclusive growth, financial inclusion, and rates of inflation.

Table 2: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
ING	55	0	1.04	-2.235	1.955
FIN	13	0	1.93	-2.727	2.995
HDI	55	0.525	0.038	0.438	0.59
LFPR	55	52.047	31.29	6.46	85.751
Inflation	50	4.691	4.464	-.391	16.56
Trade	55	36.579	23.706	.314	85.2
DCPS	54	14.603	9.357	2.326	36.648
GFCF	55	23.457	9.682	2.34	43.218
WFI	13	56.496	12.428	39.216	81.259
SFI	20	12.593	8.079	1.495	26.784
ACC_M	19	37.908	23.167	2	78
ACC_F	19	48	22.452	5	86
ACC_In4	19	27.789	19.649	1	67
ACC_In6	19	48.737	26.01	5	89
BFFI	19	9.316	6.464	1	22
ODCC	19	14.842	10.787	2	38
MRDP	14	40.143	25.413	4	79

Source: Author's Computation Using Stata 17

Autocorrelation Test

Table 3 shows the bias-corrected Born and Breitung (2016) panel test for autocorrelation among the variables over the study period. The alternative hypothesis, that there is serial autocorrelation up to a specific lag order (p), is opposite to the alternative hypothesis, that there is serial correlation. The null hypothesis is that there is no serial autocorrelation. The findings, as given in Table 3, indicate that the majority of the variables' error variances or residuals are linked with their lag values. The fact that the variables (ING, HDI, inflation, trade, SFI, ACC_M, ACC_In4, ACC_In6) are statistically significant at the conventional 5% or 10% significance level is evidence of this. Because of these findings, estimating the models using the customary static panel models of random and fixed effects may produce false regression results that are inappropriate for use in making policy. Hence, the study adopted the Driscoll and Kraay (1998) augmented fixed effects estimation technique to counteract the effects of autocorrelation, heteroskedasticity, and possible cross-sectional (and temporal) dependence.

Table 3: Born and Breitung (2016) Q(p)-Test for Autocorrelation

Variable	Q(p) – stat	p-value	N	Max	Balance?
ING	28.31	0.000	5	11	Balanced
HDI	19.66	0.000	5	11	Balanced
LFPR	3.39	0.184	5	11	Balanced
Inflation	119.39	0.000	5	11	Unbalanced
Trade	4.87	0.088	5	11	Balanced
DCPS	3.44	0.179	5	11	Unbalanced
GFCF	2.17	0.338	5	11	Balanced
SFI	2.63	0.011	5	4	Balanced
ACC_F	31.75	0.269	5	4	Unbalanced
ACC_M	17.91	0.000	5	4	Unbalanced
ACC_In4	6.93	0.000	5	4	Unbalanced
ACC_In6	10.40	0.031	5	4	Unbalanced
BFFI	2.89	0.236	5	4	Unbalanced
ODCC	0.26	0.878	5	4	Unbalanced

Source: *Author's Computation using Stata 17*

Heteroskedasticity Test

This study performs White's test and the Breusch-Pagan test for heteroskedasticity to determine whether the residuals in the specified models have constant variance. This is because in the presence of heteroskedasticity, the variance, standard errors, and t-statistics of the estimated parameters are inflated, thereby undermining the efficiency and consistency of the estimates. The null hypothesis surrounding both White's test and the Breusch-Pagan test for heteroskedasticity is that there is homoscedastic or constant variance in the residual of estimated parameters (Gujarati & Porter, 2009). However, based on the results presented in Table 4, we failed to reject the null hypothesis of homoscedasticity as the P-values of all the estimated models were greater than the 5% critical values.

Table 4: White's and Breusch-Pagan test for Heteroskedasticity

White's test					
	(1)	(2)	(3)	(4)	(5)
Chi-square test value	11.00	16.00	16.00	16.00	16.00
P-value	0.3575	0.3821	0.3821	0.3821	0.3821
Breusch–Pagan/Cook–Weisberg test					
Chi-square test value	0.89	0.03	0.01	0.05	0.02
P-value	0.3450	0.8662	0.9337	0.8218	0.8902

Source: Author's Computation using Stata 17

Effects of Financial Inclusion on Inclusive Growth in East Africa

The aggregate financial inclusion index has a positive but statistically negligible impact on inclusive growth in East Africa, according to the findings based on the Driscoll and Kraay augmented fixed effects estimate technique, as shown in Table 5. Similar to the above, the results indicate that account ownership at financial institutions or with mobile money service providers by the 40% of East Africans with the lowest incomes and the 60% with the highest incomes positively influence inclusive growth, though the effects of account ownership by the latter group are not statistically significant. These results demonstrate that access to and use of financial services are influenced by wealth ownership. Because of this, the population's poorest quintile relies on unstructured financial services from informal providers, rendering them more financially excluded.

The results also show that gender differences in account ownership have a positive and statistically significant impact on inclusive growth in East Africa. On average, a percentage increase in female account ownership and male account ownership will lead to a 0.025% and 0.024% increase in inclusive growth, respectively. This implies that the financial inclusion of men and women gives them a chance to rely on their own financial capacities to make financial decisions that can benefit them at a personal level. This way, they will be able to improve their economic levels by saving and borrowing funds from financial institutions at favorable terms. They can use the funds to improve their level of education, start a business, afford quality health services, and access balanced diet food.

In addition, the results indicate that higher inflation rates and domestic investment negatively and statistically significantly affect the degree of inclusive growth in East Africa based on the control factors. Ceteris paribus, an increase of 1% in the inflation rate and the amount of domestic investment (GFCF), will respectively result in a 0.83% and a 0.047% decline in the rate of inclusive growth in East Africa. Contrarily, the results show that trade openness and private persons' access to finance (domestic bank loans to the private sector) statistically considerably improve East African inclusive growth performance. Specifically, a 1% increase in the level of openness to trade and access to finance by private enterprises will enhance the level of inclusive growth in East Africa by about 0.12% and 0.02%, respectively.

Domestic credit to the private sector by banks enables financial service providers to access funds to develop technology and other mechanisms for offering financial services to rural

communities. Overall, the within-group R-square demonstrates that alterations in the independent variables across the stated models may account for roughly 53% to 92% of the variations in the rates of inclusive development. As a result, the models are optimally fitted, and the conclusions are reliable enough for use in policy. The conclusions of Mohammed et al. (2017), Sarpong and Nketiah (2022), and Abor et al. (2018) are comparable to these ones.

Table 5: Driscoll and Kraay Augmented Fixed Effects Estimates – Effects of Financial Inclusion on Inclusive Growth in East Africa

VARIABLES	(1) Ing	(2) Ing	(3) Ing	(4) ing	(5) ing
Inflation	-3.895***	-0.0585***	-0.0589**	-0.0542***	-0.0607***
	(0.174)	(0.0100)	(0.0102)	(0.00362)	(0.00841)
Trade	0.526***	0.0149***	0.0135**	0.0189***	0.0206**
	(0.0268)	(0.00218)	(0.00262)	(0.00297)	(0.00404)
DCPS	0.0331**	0.0242**	0.0124**	0.0159**	0.0154*
	(0.00416)	(0.00521)	(0.00341)	(0.00469)	(0.00505)
GFCF	-0.124***	-0.0189**	-0.0278*	-0.0333**	-0.0343**
	(0.00754)	(0.00370)	(0.00995)	(0.00852)	(0.00954)
FIN	0.00844				
	(0.0245)				
ACC_In4		0.0119*			
		(0.00447)			
ACC_In6			0.0106		
			(0.00722)		
ACC_F				0.0247*	
				(0.00808)	
ACC_M					0.0239*
					(0.00992)
Constant	3.890***	-0.373	-0.159	-0.701**	-0.867
	(0.183)	(0.190)	(0.184)	(0.205)	(0.390)
Observations	11	16	16	16	16
within R-squared	0.9247	0.5894	0.5291	0.6935	0.6037
Number of groups	5	5	5	5	5

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Author's Computation using Stata 17

Effects of Financial Inclusion on the Different Dimensions of Inclusive Growth in East Africa

To check for the robustness of the results, we decided to further examine the effects of financial inclusion on the different dimensions of inclusive growth. The results presented in Table 6 show that financial inclusion positively and statistically significantly impacted both labor force participation and human development in East Africa over the period under study. Precisely, the results show that a unit increase in financial inclusion will result in a 9.76 and 0.015 increase in labor force participation and human development, respectively, hinting that financial inclusion has the capacity to create employment and improve population welfare needs. However, while higher inflation undermines labor force participation, it enhances human development in East Africa. Likewise, trade openness stimulates labor force participation but retards human development in East Africa.

Moreover, access to finance facilitates labor force participation but obstructs human development in East Africa. Lastly, domestic investment significantly limits labor force participation but enhances human development in East Africa. Besides, the coefficients of determination of the two models suggest that about 97% to 98% of the variations in labor force participation and human development are explained by changes in the regressors. Hence, the models are best suited for analysis and policy recommendations. This finding is similar to those of Pickens & Olga (2009) and Swamy (2012).

Table 6: Driscoll and Kraay Augmented Fixed Effects Estimates – Effects of Financial Inclusion on the Different Dimensions of Inclusive Growth in East Africa

VARIABLES	(1) LFPR	(2) HDI
Inflation	-156.8***	0.0702***
	(5.345)	(0.00359)
Trade	22.04***	-0.00864***
	(0.822)	(0.000520)
DCPS	1.283***	-0.000382
	(0.128)	(0.000168)
GFCF	-5.521***	0.00140**
	(0.231)	(0.000209)
FIN	9.767***	0.0148***
	(0.751)	(0.00121)
Constant	212.9***	0.460***
	(5.618)	(0.00631)
Observations	11	11
R-square	0.9683	0.9754
Number of groups	5	5

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Author's Computation using Stata 17

Hausman Test

The Hausman test was used in the study to compare the fixed effects model and the random effects model for estimate. The random effect is appropriate, according to the null hypothesis surrounding the Hausman test, as opposed to the alternative hypothesis that the fixed effects model is appropriate. Given that all of the estimated models in Tables 5 and 6 have P-values that are less than the 0.05 level of significance, we reject the null hypothesis based on the Hausman test results shown in Tables 7 and 8, respectively. For the two estimated models in Tables 7 and 8, it is obvious that the null hypothesis cannot be accepted at any recognized level of significance. Thus, we draw the conclusion that the fixed effects model is the most appropriate model for the estimation.

Table 7: Hausman (1978) specification test for the models specified in Table 5

	(1)	(2)	(3)	(4)	(5)
Chi-square test value	315.175	504.796	19.664	66.86	216.335
P-value	0.000	0.000	0.001	0.000	0.000

Source: Author's Computation using Stata 17

Table 8: Hausman (1978) specification test for the models specified in Table 6

	(1)	(2)
Chi-square test value	1396.949	2150000
P-value	0.000	0.000

Source: Author's Computation using Stata 17

CONCLUSION AND RECOMMENDATIONS

Using the Driscoll and Kraay augmented fixed effects estimating method, this study looked at the connection between financial inclusion and inclusive growth. The study's findings show that access to financial services and usage of such services with regard to wealth quintile and gender have a strong positive impact on inclusive growth in the region. These results show that if the economies of the areas are to experience meaningful welfare benefits from financial inclusion, businesses and individuals must increasingly utilize the various financial services accessible to them. As formal financial services are a public good, the governments in these areas should keep fostering the conditions that make them available to and usable by the underprivileged and women. Thus, it is important to promote the creation of special agents' tools to provide financial services to the underprivileged and in areas where commercial financial institutions are less likely to operate. Policymakers and financial institutions in the East Africa area then need to provide innovative, sustainable, and inclusive financial services in order to appropriately share welfare benefits. To enhance adult population access to and

utilization of financial services, they can start by financial institutions putting in place programs to raise financial literacy levels in that group. Focus should also be placed on encouraging the use of financial services by the least educated and the development of user-friendly financial services.

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