Effect of Financial Exclusion on Consumption Inequality across Settlement and Employment Types in an Emerging Economy

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Article Information

Abstract

In the quest to reduce inequality in its various forms, researchers, policymakers, and industry players have embarked on efforts to uncover empirical evidence that could inform policy-driven recommendations. However, few studies have analysed how financial exclusion may influence consumption inequality. This study employed the Ordinary Least Squares (OLS) method to model the relationship between financial exclusion and consumption inequality using the 7th wave of the Ghana Living Standards Survey (GLSS7). Financial exclusion significantly contributes to consumption inequality, with notable variations across different employment types and settlement areas. Non-digital and digital financial exclusion have a more pronounced influence on consumption inequality in rural areas than in urban areas. Additionally, households led by public sector workers and the unemployed experienced greater levels of consumption inequality due to financial exclusion, compared to those led by self-employed or privately employed individuals. This study highlights the role of financial inclusion in addressing consumption inequality and stresses the importance of reducing both digital and non-digital financial exclusion to create a more equitable society. To this end, the study recommends that the National Commission for Civic Education (NCCE) implement financial literacy programmes in local languages, particularly targeting rural areas. The novelty of this study lies in its focus on the employment sector of household heads and its examination of both digital and non-digital financial exclusion, providing a unique perspective on how these forms of exclusion affect consumption inequality across varied demographics.

Introduction

The need to reduce income inequality and poverty is a fundamental focus of the Sustainable Development Goals (SDGs). Three of the 17 goals are dedicated to addressing income inequality, eradicating poverty, and promoting inclusive growth (Krysovatyy et al., 2024). Researchers have identified factors such as unfair redistribution of resources and poor management and allocation as key drivers of poverty (Law & Tan, 2009; Usman et al., 2021; Perugini & Tekin, 2022). According to Perugini and Tekin (2022), a country's level of financial development is closely linked to its rate of financial

exclusion. Thus, high levels of financial development typically result in greater access to financial services and products, which, in turn, reduce financial exclusion (Baiardi & Morana, 2018; Perugini & Tekin, 2022). Financial exclusion refers to the inability of individuals or populations to access basic financial services such as savings accounts, loans, cashless transactions, credit, and other traditional banking services (FINCA International, 2021). According to FINCA International, it can be broadly categorised into digital and non-digital forms. Digital financial exclusion (DFE) involves the lack of access to services such as e-zwich accounts, e-banking, mobile money, and other electronic payment systems. In contrast, non-digital financial exclusion (NDFE) refers to exclusion from essential financial services like account ownership, access to credit, and insurance (FINCA International, 2021).

Several empirical studies suggest that financial exclusion can influence multidimensional poverty and consumption inequality (Attanasio & Pistaferri, 2016; Corrado & Corrado, 2017). Blundell et al. (2008) noted that exclusion from insurance – an important indicator of financial exclusion – can affect consumption levels in society. Similarly, Bartiaux (2021) found that financial exclusion is linked to varying levels of consumption. Bartiaux further observed that individuals from medium and upper social classes tend to have greater access to financial resources than those in lower social classes. Moreover, drawing on the individualistic theory of poverty, Saidu and Marafa (2020) argued that individuals who are either unable or unwilling to engage in economic activities that promote financial inclusion may face significant challenges, such as insufficient funds and difficulties in meeting daily consumption needs. This indicates that high levels of financial exclusion contribute to a widening consumption gap. In line with this, Li et al. (2020) asserted that exclusion from digital financial products negatively affects household consumption in critical areas, including food, clothing, housing, healthcare, education, and entertainment.

While the link between financial exclusion and consumption inequality is crucial (Bartiaux, 2021; Li et al., 2020), as it highlights how limited access to financial services exacerbates disparities in living standards, there is limited empirical research on this relationship in the context of sub-Saharan Africa (SSA), where poverty is relatively high and the financial sector underdeveloped – stifling financial intermediation and the equitable allocation of resources to the poor (IMF, 2020; World Bank, 2020). The majority of extant studies on consumption inequality do not directly evaluate its association with financial exclusion (Park & Mercado, 2018; Bartiaux, 2021; Luo & Li, 2022). Those that are closely related mention financial exclusion only passively, without analysing how the two concepts are empirically connected (Corrado & Corrado, 2017; Li et al., 2020). Moreover, researchers are yet to assess how DFE and NDFE individually and separately influence consumption inequality, limiting a comprehensive understanding of their distinct impacts. This gap in the literature makes it difficult to determine whether digital or non-digital financial exclusion plays a more critical role in widening consumption disparities. Without such insights, the development of targeted interventions to promote financial inclusion and mitigate consumption inequality remains challenging (Inoue, 2019; Zahonogo, 2017). Tsatsou (2022) suggest that studies are needed to explore these dimensions, as addressing both forms of exclusion may require tailored strategies that reflect the unique needs and circumstances of different population groups.

Furthermore, although the literature suggests that the relationship between financial inclusion and consumption inequality may vary across different settlement and employment types (Li, 2023; Ozili, 2021), these dynamics remain underexplored. Settlement types – such as urban, peri-urban, and rural areas – offer differing levels of access to financial services, infrastructure, and economic opportunities, which shape consumption patterns in distinct ways. Similarly, employment types – such as formal, informal, or self-employment – can influence individuals' income stability and access to credit and savings, further affecting their capacity to manage consumption effectively. Understanding these nuances is essential for designing context-specific policies that address the unique financial challenges faced by diverse communities and employment groups. This paper, therefore, examines the effect of financial exclusion (DFE and NDFE) on consumption inequality in an emerging sub-Saharan African (SSA)

economy, Ghana, using the most recent Ghana Living Standards Survey (GLSS7) data from the Ghana Statistical Service. Specifically, the paper first tests the effect of financial exclusion (DFE and NDFE) on consumption inequality. Second, it analyses the influence of financial exclusion on consumption inequality across different settlement types (urban and rural areas). Finally, it assesses the relationship between financial exclusion and consumption inequality across employment types (public employment, private employment, self-employment, and unemployment).

Overall, this study makes a significant contribution to the existing body of knowledge on consumption and financial exclusion, as it is, to the best of the researcher's knowledge, the first to comprehensively analyse how different dimensions of financial exclusion influence consumption inequality across settlement and employment types within an emerging sub-Saharan African context. It is, therefore, of great relevance to scholars and academics, both experienced and emerging, as well as policymakers, economists, governments, financial institutions, investors, policy think tanks, and international financial and economic agencies.

The remainder of the paper is organised as follows: Section 2 reviews the relevant literature on the subject, while Sections 3, 4, and 5 present the methodology, results, and discussion and conclusions, respectively.

Literature Review

Theoretical background

The McKinnon conduit Effect Theory suggests that financial development reduces poverty and inequality by improving access to financial services, particularly for the poor in developing economies (McKinnon, 1973; Boukhatem, 2016). According to the theory, financial deepening enables savings to be channelled into productive investments, which raises consumption per capita, promotes economic growth, and reduces consumption and income inequality (Dauda & Makinde, 2014; Seven & Coskun, 2016). However, in economies with underdeveloped financial systems – where formal financial markets and institutions are lacking – financial exclusion occurs (Boukhatem, 2016; Sehrawat & Giri, 2016). Financial exclusion limits the ability of marginalised groups, such as rural residents or those in informal employment, to access savings, credit, and other financial services. Consequently, these groups are more vulnerable to poverty and face higher levels of consumption inequality (Abdin, 2016). In contexts like sub-Saharan Africa (SSA) and Ghana, the theory suggests that financial exclusion worsens consumption inequality across different settlement types and employment types (Jeanneney & Kpodar, 2011). Rural populations and informal workers, who typically have limited access to formal financial services, are more likely to experience restricted economic opportunities. This deepens disparities in consumption and economic welfare compared to urban and formally employed counterparts who benefit more from financial development (Inoue, 2019; Mohieldin et al., 2019). Thus, reducing financial exclusion is crucial for narrowing inequality gaps, as access to financial services allows marginalised groups to save, invest, and improve their consumption levels (Dauda & Makinde, 2014).

Hypotheses development

The relationship between financial exclusion – both digital financial exclusion (DFE) and non-digital financial exclusion (NDFE) – and consumption inequality appears to be a relatively new area of study, with limited empirical research available. Most prior studies focus either on consumption inequality without linking it directly to financial exclusion, or on financial exclusion while examining

variables other than consumption inequality. Blundell, Pistaferri and Preston (2008) explored the connection between consumption inequality and partial insurance, revealing that while there is some insurance against permanent shocks, income and consumption inequality do not move together. Although financial exclusion was not the central focus, exclusion from insurance – one dimension of financial exclusion – can still relate to consumption inequality. Similarly, Bartiaux (2021) discussed financial disparities across social classes and suggested that individuals from higher social classes have greater access to financial resources than those from lower social classes, which influences consumption patterns. However, this study did not empirically assess the effect of financial exclusion on consumption inequality, relying instead on descriptive analyses.

Li, Wu and Xiao (2020) found that digital financial inclusion promotes household consumption, particularly in areas such as food, housing, healthcare, and education. Conversely, those excluded from digital finance may struggle to cover essential expenditures, which could exacerbate consumption inequality. However, their study did not specifically address whether financial exclusion (either digital or non-digital) predicts consumption inequality. Corrado and Corrado (2017) emphasised that equitable access to financial services promotes consumption equality, while exclusion from financial services contributes to unequal consumption patterns and hinders economic development. Although the authors inferred a relationship between financial exclusion and consumption inequality, they did not directly measure the effect of financial exclusion on consumption inequality. Other studies (Park & Mercado, 2018; Luo & Li, 2022; Pal & Pal, 2014) have explored related themes. For instance, Park and Mercado (2015) found that financial inclusion reduces poverty and income inequality in developing Asia, while Luo and Li (2022) highlighted that the intensive use of financial products lowers consumption inequality. Pal and Pal (2012) noted a connection between income inequality and disparities in financial inclusion. While these studies provide valuable insights, they fall short of empirically analysing the direct effect of financial exclusion on consumption inequality.

Other studies (Tiwari, Goli, Siddiqui, & Salve, 2022; Aguiar & Bils, 2015) explored the links between wealth inequality, financial exclusion, and consumption inequality. Tiwari et al. (2022) argued that reducing poverty and distributing wealth fairly could decrease financial exclusion by enabling access to formal and informal financial services. Aguiar and Bils (2015) reported that consumption inequality closely mirrors income inequality, potentially implying a link to financial exclusion, as also suggested by Russell, Maître and Donnelly (2011). From the review, it is evident that most prior studies did not focus specifically on the effect of financial exclusion – particularly digital and non-digital exclusion – on consumption inequality. Moreover, existing research has not sufficiently addressed the variation in this relationship across settlement types (urban vs. rural) or employment types (public, private, self-employed, and unemployed). The gaps in the literature suggest a need for further investigation. This study, therefore, hypothesised that:

H1: Financial exclusion (DFE and NDFE) significantly and positively influences consumption inequality.
H2: The effect of financial exclusion on consumption inequality differs across settlement types (urban and rural areas).
H3: The relationship between financial exclusion and consumption inequality varies across employment types (public employment, private employment, self-employment, and unemployment).

Research Methods

Following prior studies, the researcher employed a quantitative approach using an explanatory research design, as the study seeks to use survey data to determine the relationship between financial exclusion and consumption inequality (Bartiaux, 2021; Luo & Li, 2022; Tiwari et al., 2022). Data were sourced from the Ghana Statistical Service's most recent Ghana Living Standards Survey (GLSS7). The

GLSS is a multi-purpose household survey that collects data on a wide range of living conditions, including employment, education, health, and household expenditures on both food and non-food items. For this study, the relevant sections of the dataset include Household level – poverty file, Section 2 on education, Section 7 on household characteristics, and Section 12 on household financial transactions. The key variables of interest from GLSS7 were financial exclusion and consumption inequality. Additional covariates used from the GLSS7 dataset include age, sex, household size, settlement type, educational level, marital status, employment type, religion, and area.

Consumption inequality was the dependent variable in this empirical analysis, measured using the Gini coefficient. The Gini coefficient was generated from household consumption expenditure data, with each individual's contribution within districts or subgroups to the total household inequality (Noghanibehambari, & Rahnamamoghadam, 2020; Mookodi, 2021). The Gini index can be decomposed as follows (Allen, 2022):

$$I= \underbrace{\sum_{g=1}^{G} \phi_g \, \varphi_g \, I_g}_{Between} + \underset{Within}{\overline{I_g}} \quad + \underset{Overlap}{R}$$

(1)

Where:

ϕ_g is the household share of group g

φ_g the consumption shares of g

$\overline{I_g}$ is the between group inequality

R_g is the residue implied by the group consumption overlap

The main independent variable was financial exclusion, measured using a multidimensional approach. This included indicators such as account ownership, access to credit, ownership of insurance, and the use of financial products (ATM, E-zwich, E-banking, mobile money). The study employed two financial exclusion metrics: Non-digital financial exclusion – a composite measure of account ownership, credit access, and health insurance utilisation, and digital financial exclusion – a combination of ATM, E-zwich, E-banking, and mobile money account usage (GSS, 2017). The Ordinary Least Square (OLS) estimation method was used for examining the relationship between financial exclusion and consumption inequality. The application of OLS is subject to the assumptions underlying the Classical Linear Regression Models (CLRM) (Cameron & Trivedi, 2005). OLS deals with the relation between the dependent variable Y_i (consumption inequality) and the independent variable X_i, financial exclusion, such that the conditional mean function is specified as:

$$E\left(^{y_i}/_{X_{ai}}\right)= \acute{X}\beta$$

(2)

And the resultant estimator ($\hat{\beta}$), which must satisfy the basic assumption underlying the classical regression model is given below:

$$\hat{\beta}= min \sum_{i=1}^{n} \left(\left(E\left(^{y_i}/_{X_i}\right) - \acute{X}\beta\right)^2\right)$$

(3)

Where: $\hat{\beta}$ is the estimator under OLS that minimises the conditional mean function. The estimator, which is the sum of the error squared, is assumed Best Linear Unbiased Estimator (BLUE) under the Classical Linear Regression Model (CLRM) (Cameron & Trivedi, 2005). Under such an assumption it is important to ensure that the model is not only linear in parameters but also with an error term that is both serially uncorrelated and homoscedastic. The estimable linear regression equation is specified as:

$GINI_i = \beta_0 + \beta_1 NDFE_i + \beta_2 DFE_i + \beta_3 Urban_i + \beta_5 PrivateEmpi_i + \beta_6 SelfEmpi_i + \beta_7 Unemployed_i + \beta_8 Age_i + \beta_9 Sex_i + \beta_{10} Education_i + \beta_{11} HHSize_i + \beta_{12} MaritalStatus_i + \varepsilon_i$

(4)

Table 1 summarises the definitions of the variables used in the study.

Table 1: Definition and Measurement of Variables

Variable	Definition	Measurement	A prior sign
Consumption inequality	The consumption inequality that exist within a household	Index, computed as I= $\underbrace{\sum_{g=1}^{G} \phi_g\, \varphi_g\, I_g}_{Between}$ + $\underbrace{\overline{I_g}}_{Within}$ + $\underbrace{R}_{Overlap}$ (Allen, 2022)	
Financial exclusion	*Non-digital* and *digital financial exclusion* of a household head	• NDFE is a composite measure of account ownership, credit access, and health insurance utilisation [(GLSS7, GSS(2017)] • DFE is a composite measure of ATM, E-zwich, E-banking, and mobile money account usage[(GLSS7, GSS(2017)]	+
Education	The highest educational level of a household head	Categorical dummy, with k-1 dummy variables [1 if university, 0 otherwise; 1 if basic, 0 otherwise; 1 if senior high, 0 otherwise; 1 if training college, 0 otherwise; 1 if polytechnic, 0 otherwise. *None (or no formal education)* is the baseline category]	+
Sex	The gender of a household head	Binary dummy; male = 1; female = 0	+
Age	Age of a household head	Number of years	+
Marital status	Marital status of a household head	Binary; married = 1; otherwise = 0	-+
Household size	The number of people belonging to a household	Number of people in a household	+
Settlement type	The locality of the household head	Binary dummy [1 if urban, 0 otherwise (rural)]	-+
Employment	Measures the employment status of the household head	Categorical dummy [1 if private, 0 otherwise; 1 if self-employed, 0 otherwise; 1 if unemployed, 0 otherwise. The reference category is *public employment*]	-+

Source: Author's construct (2024)

Empirical Results

This section analyses the effect of financial exclusion (digital and non-digital) on consumption inequality. It is organised into four subsections. The first subsection presents the summary statistics, highlighting the distribution of data across non-digital financial exclusion, digital exclusion, consumption inequality, and respondents' demographic characteristics, using measures such as the mean, standard deviation, minimum, and maximum. District level consumption inequality is also captured. The second subsection provides inferential statistics to examine the effect of financial exclusion on consumption inequality across settlement types (rural and urban). Finally, the effect of financial exclusion on

consumption inequality is analysed by considering the employment type of household heads – public, private, self-employed, and unemployed.

Summary statistics

This section presents summary statistics for non-digital financial exclusion, digital exclusion, consumption inequality (Gini), and respondents' demographic characteristics, using mean, standard deviation, minimum, and maximum scores, as displayed in Table 2.

Table 2: Summary Statistics of Variables

Variable	Mean	Std. dev.	Min	Max
NDFE	0.4152	0.4928	0	1
DFE	0.4152	0.4928	0	1
Gini	0.3747	0.0744	0.208	0.635
Age	46.5426	16.0313	15	99
Male	0.6819	0.4658	0	1
Hhsize	4.1263	2.8741	1	28
Married	0.5411	0.4983	0	1
Urban	0.4278	0.4948	0	1
Education				
None	0.2939	0.4556	0	1
Basic	0.4874	0.4999	0	1
SHS	0.0995	0.2994	0	1
Training college	0.0486	0.2150	0	1
Polytechnic	0.0195	0.1383	0	1
University	0.0512	0.2204	0	1

Notes:
- *Observations = 12,974*
- *NDFE = Non-digital finance exclusion; DFE = Digital financial exclusion; Gini = Consumption inequality score; Hhsize = Household size; SHS = Senior High School*

Source: Author's computations (2024)

The results presented in Table 2 reveal that non-digital and digital financial exclusion rates were identical across respondents, with approximately 41.5 percent of respondents excluded from both digital and non-digital financial services and access. Additionally, consumption inequality averaged nearly 37.5 percent, peaking at 63.5 percent. Demographically, the average respondent age was about 47 years, with the oldest at 99 years. Males comprised about 68.2 percent of the sample, while females accounted for approximately 31.8 percent, with an average household size of four members. Regarding marital status, 54.1 percent of respondents were married. Most respondents resided in rural areas, with only 42.8 percent in urban centres. Educational attainment varied, with 29.4 percent lacking formal education, 48.7 percent having completed only basic schooling, approximately 10 percent attaining senior high school, and smaller proportions reaching training college (4.9 percent), polytechnic (2.0 percent), and university (5.1 percent).

Financial exclusion and consumption inequality

This section presents an analysis of the effect of financial exclusion on consumption inequality. Two sets of models are displayed in Table 3. The first model shows the relationship between non-digital financial exclusion and consumption inequality, controlling for demographic factors, while the second model illustrates the effect of digital financial exclusion on consumption inequality, also controlling for demographic factors.

Table 3: Effect of Financial Exclusion on Consumption Inequality

Variables	(1) Consumption inequality	(2) Consumption inequality
NDFE	0.0058***(0.0014)	
DFE		0.0097***(0.0015)
Age	-0.0003***(0.0000)	-0.0004***(0.0000)
Male	0.0036**(0.0016)	0.0039**(0.0015)
Married	0.0105***(0.0015)	0.0104***(0.0015)
Education		
Basic	-0.0274***(0.0015)	-0.0281***(0.0015)
SHS	-0.0212***(0.0024)	-0.0221***(0.0023)
Poly	-0.0170***(0.0031)	-0.0173***(0.0031)
University	-0.0178***(0.0042)	-0.0172***(0.0042)
Employment		
Private	-0.0164***(0.0030)	-0.0170***(0.0030)
Self	-0.0110***(0.0029)	-0.0122***(0.0029)
Unemployed	0.0077**(0.0031)	0.0062**(0.0031)
Household size	0.0011***(0.0003)	0.0011***(0.0003)
Urban	-0.0217***(0.0013)	-0.0218***(0.0013)
Constant	0.4087***(0.0038)	0.4062***(0.0038)
Observations	12,974	13,086
R-squared	0.0951	0.0966

Note:
- *Robust standard errors are in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$*
- *NDFE = Non-digital financial exclusion, DFE = Digital financial exclusion, SHS = Senior High School*

Source: Author's computations (2024)

Several key observations can be made from the results in Table 3. First, all the covariates in Model 1 show a negative correlation with consumption inequality and are statistically significant at the 1% level, except for gender and unemployment, which are also significant at the 5% level. Notably, older individuals tend to fare better, as consumption inequality decreases with age (-0.0003). Households headed by females appear to experience lower levels of consumption inequality compared to those headed by males (0.0036). Additionally, households headed by individuals with education, regardless of level, experience lower consumption inequality compared to those with no formal education (Table 2, Column 2, Rows 7-10). Interestingly, consumption inequality is significantly lower among individuals employed in sectors outside the public sector, whereas unemployed individuals experience notably higher inequality (0.0077). Larger households also experience higher levels of consumption inequality (0.0011). Moreover, households in urban centres fare better in terms of consumption inequality compared to those in rural areas (-0.0217), holding other factors constant. The directions and significance levels of these covariates' effects on consumption inequality remain consistent in Model 2. Particularly, while the

effect of household size (0.0011) remains unchanged between the two models, the magnitudes of the other covariates' effects vary, showing a mix of increases and decreases.

Turning to the main relationship under study, the results indicate that financial exclusion – both non-digital (0.0058) and digital (0.0097) – positively influences consumption inequality. Importantly, the effects of both types of financial exclusion are statistically significant at the 1% level. Model 1 explains approximately 9.5% of the total variation in consumption inequality, while model 2 explains around 9.7%. This suggests that financial exclusion is a significant determinant of consumption inequality in Ghana. Specifically, holding all other factors constant, a unit change in non-digital financial exclusion would result in a 0.0058 change in consumption inequality levels. Similarly, a unit change in digital financial exclusion would lead to a 0.0097 change in consumption inequality levels. In other words, an increase in non-digital financial exclusion would cause a 0.0058 increase in consumption inequality, while an increase in digital financial exclusion would lead to a 0.0097 increase in consumption inequality, all other factors being equal. This suggests that both non-digital and digital financial exclusion are directly associated with consumption inequality, indicating that reducing exclusion rates or increasing inclusion rates may help close the consumption inequality gap.

Financial exclusion and consumption inequality across settlement types

Table 4 displays the results on the effect of financial exclusion on consumption inequality, across settlement types – urban and rural. From Table 4, it can be observed that, except for the male group and private employment, all other demographic variables showed significant effects on consumption inequality across all models. Specifically, the magnitude of age on consumption inequality remained consistent across Models 1 and 2 (-0.0004) and showed similar consistency in Models 3 and 4 (-0.0003). However, the significance level of the effect of university education decreased from 5 percent in Models 1 and 2 to 10 percent in Models 3 and 4.

Table 4: Effect of Financial Exclusion on Consumption Inequality: Settlement Types

	(1)	(2)	(3)	(4)
Variables	Rural		Urban	
Age	-0.0004***(0.0001)	-0.0004***(0.0001)	-0.0003***(0.0001)	-0.0003***(0.0001)
Male	0.0036(0.0024)	0.0042*(0.0023)	0.0036*(0.0020)	0.0037*(0.0020)
Married	0.0137***(0.0023)	0.0135***(0.0022)	0.0059***(0.0020)	0.0061***(0.0020)
Education				
Basic	-0.0335***(0.0020)	-0.0339***(0.0020)	-0.0149***(0.0022)	-0.0155***(0.0022)
SHS	-0.0219***(0.0041)	-0.0227***(0.0040)	-0.0138***(0.0030)	-0.0145***(0.0029)
Polytechnic	-0.0183***(0.0055)	-0.0174***(0.0056)	-0.0081**(0.0038)	-0.0088**(0.0037)
University	-0.0206**(0.0088)	-0.0204**(0.0087)	-0.0095*(0.0048)	-0.0088*(0.0048)
Employment				
Private	-0.0087(0.0056)	-0.0093*(0.0056)	-0.0218***(0.0035)	-0.0224***(0.0035)
Self	-0.0027(0.0051)	-0.0040(0.0051)	-0.0151***(0.0034)	-0.0160***(0.0034)
Unemployed	0.0254***(0.0055)	0.0241***(0.0055)	-0.0111***(0.0038)	-0.0129***(0.0038)
Household size	0.0009***(0.0003)	0.0009***(0.0003)	0.0012***(0.0004)	0.0011***(0.0004)
NDFE	0.0073***(0.0019)		0.0022(0.0019)	
DFE		0.0135***(0.0024)		0.0059***(0.0018)
Constant	0.4028***(0.0059)	0.3978***(0.0059)	0.3843***(0.0047)	0.3832***(0.0047)
Observations	7,424	7,481	5,550	5,605
R-squared	0.0858	0.0869	0.0310	0.0324

Note:
- *Dependent variable is consumption inequality*
- *Robust standard errors are in parentheses; *** p < 0.01, ** p < 0.05, * p < 0.1*
- *NDFE = Non-digital financial exclusion, DFE = Digital financial exclusion, SHS = Senior High School*

Source: Author's computations (2024)

Additionally, the significance level of private sector employment improved from 10 percent in Model 2 to 1 percent in Models 3 and 4. Regarding non-digital financial exclusion, results revealed that an increase in its level would lead to a significant increase in consumption inequality among households in rural areas (0.0073). Likewise, as digital financial exclusion rises, consumption inequality among rural dwellers is exacerbated (0.0135). Digital financial exclusion also showed a significant positive effect on consumption inequality among urban residents (0.0059). In contrast, the relationship between non-digital financial exclusion and consumption inequality among urban dwellers was statistically insignificant (β = 0.0022, SE = 0.0019). Another notable observation is that the effect of digital financial exclusion on consumption inequality among urban dwellers was lower by 0.0076 compared to rural dwellers, decreasing from 0.0135 to 0.0059. Comparatively, this suggests that households in rural areas are more likely to experience higher levels of consumption inequality than their urban counterparts when faced with digital financial exclusion.

Financial exclusion and consumption inequality across employment types

Table 5 presents the effect of financial exclusion on consumption inequality, with respect to the employment sector of household heads. From the results displayed in Table 5, it is observed that in only Models 5 and 6 were all demographic characteristics found to have significant effects on consumption inequality. Most of these characteristics showed a negative relationship with consumption inequality, suggesting that households headed by self-employed individuals are more likely to experience lower consumption inequality as the level of these characteristics increases.

Table 5: Effect of Financial Exclusion on Consumption Inequality across Employment types

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Public employee		Private employee		Self employed		Unemployed	
Age	-0.0004	-0.0003	-0.0001	-0.0002	-0.0003***	-0.0003***	-0.0005***	-0.0005***
	(0.0003)	(0.0003)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Male	-0.0089	-0.0099	-0.0006	0.0000	0.0060***	0.0066***	0.0056	0.0049
	(0.0064)	(0.0065)	(0.0038)	(0.0038)	(0.0020)	(0.0020)	(0.0037)	(0.0036)
Married	0.0064	0.0056	0.0091***	0.0094***	0.0094***	0.0092***	0.0135***	0.0134***
	(0.0059)	(0.0060)	(0.0034)	(0.0034)	(0.0020)	(0.0020)	(0.0039)	(0.0039)
Education								
Basic	-0.0100	-0.0111	-0.0178***	-0.0184***	-0.0283***	-0.0281***	-0.0363***	-0.0373***
	(0.0069)	(0.0072)	(0.0039)	(0.0039)	(0.0020)	(0.0019)	(0.0034)	(0.0034)
SHS	-0.0124	-0.0120	-0.0134***	-0.0138***	-0.0216***	-0.0215***	-0.0303***	-0.0326***
	(0.0083)	(0.0082)	(0.0046)	(0.0046)	(0.0034)	(0.0034)	(0.0063)	(0.0062)
Polytechnic	0.0063	0.0056	-0.0197***	-0.0199***	-0.0272***	-0.0258***	-0.0149**	-0.0188***
	(0.0068)	(0.0068)	(0.0067)	(0.0066)	(0.0047)	(0.0048)	(0.0075)	(0.0073)
University	0.0175*	0.0176*	-0.0135*	-0.0129*	-0.0247***	-0.0230***	-0.0379***	-0.0394***
	(0.0101)	(0.0101)	(0.0075)	(0.0074)	(0.0075)	(0.0074)	(0.0084)	(0.0083)
Household size	-0.0002	-0.0003	0.0013*	0.0012	0.0008**	0.0008***	0.0017***	0.0016***
	(0.0012)	(0.0012)	(0.0007)	(0.0007)	(0.0003)	(0.0003)	(0.0006)	(0.0006)
Urban	-0.0084	-0.0083	-0.0186***	-0.0183***	-0.0166***	-0.0160***	-0.0382***	-0.0396***

Table 5 Cond.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	(0.0054)	(0.0056)	(0.0032)	(0.0032)	(0.0017)	(0.0017)	(0.0032)	(0.0031)
NDFE	0.0504**		0.0029		0.0032*		0.0102***	
	(0.0235)		(0.0032)		(0.0017)		(0.0031)	
DFE		0.0095*		0.0076***		0.0104***		0.0070*
		(0.0054)		(0.0028)		(0.0020)		(0.0041)
Constant	0.4047***	0.4021***	0.3803***	0.3775***	0.3951***	0.3889***	0.4317***	0.4328***
	(0.0121)	(0.0121)	(0.0068)	(0.0068)	(0.0042)	(0.0042)	(0.0069)	(0.0073)
Observations	912	916	2,180	2,199	7,238	7,281	2,644	2,690
R-squared	0.0299	0.0242	0.0405	0.0436	0.0739	0.0768	0.1696	0.1675

Note:
- *Dependent variable is consumption inequality*
- *Robust standard errors are in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$*
- *NDFE = Non-digital financial exclusion, DFE = Digital financial exclusion, SHS = Senior High School*

Source: Author's computations (2024)

Additionally, both digital financial exclusion (0.0504) and non-digital financial exclusion (0.0095) were significantly correlated with consumption inequality among households whose heads are employed in the public sector. Similarly, among households headed by self-employed individuals, consumption inequality increased as both digital (0.0104) and non-digital (0.0032) financial exclusion levels rose. For households with unemployed heads, consumption inequality increased as non-digital (0.0102) and digital (0.0070) financial exclusion levels rose, holding all other factors constant. Furthermore, no significant effect of non-digital financial exclusion was observed on consumption inequality among households with heads employed in the private sector. However, digital financial exclusion was positively associated with consumption inequality in these households. Notably, non-digitally excluded households with public sector-employed heads experienced the highest rate of consumption inequality (0.0504), compared to those with self-employed (0.0032) and unemployed (0.0102) heads. For digital financial exclusion, households with self-employed heads had the highest rate of consumption inequality (0.0104), relative to those with unemployed (0.0070), privately employed (0.0076), or publicly employed (0.0095) heads. Thus, the extent of the relationship between financial exclusion and consumption inequality varies across employment types.

Discussion of Results

This study aimed to examine the effect of financial exclusion on consumption inequality, focusing specifically on the impacts of non-digital and digital financial exclusion across different settlement and employment types. The results indicated that high levels of both non-digital financial exclusion (NDFE) and digital financial exclusion (DFE) contribute to consumption inequality, aligning with the McKinnon conduit effect theory (Dauda & Makinde, 2014). The positive relationships between DFE and consumption inequality, as well as between NDFE and consumption inequality, supported the study's first hypothesis (H1). Similarly, the differing effects of DFE and NDFE on consumption inequality across urban and rural settlement types validated the second hypothesis (H2). The third hypothesis (H3) was confirmed by the varying effects of DFE and NDFE on consumption inequality across different employment types.

The relationship between financial exclusion and consumption inequality suggests that societies with a significant proportion of financially excluded individuals are likely to experience higher levels of consumption inequality. Engaging in both digital and non-digital financial transactions may help

improve the financial situation of these individuals, enabling them to spend on essentials such as food, clothing, housing, healthcare, education, and entertainment, thereby potentially reducing consumption inequality. Financially excluded individuals are also more likely to experience poverty compared to those who are financially included (Adewale, 2014). This is partly because financially excluded individuals may struggle to access loan facilities (Ofeh & Thalut, 2018), limiting their ability to purchase basic goods and services and thus widening the consumption gap. These findings align with Bartiaux (2021) and Li et al. (2020). Bartiaux (2021) argues that financial exclusion is associated with consumption levels within society, noting that individuals from middle and upper social classes have greater access to financial resources than those in lower social classes. In other words, as the rate of financial exclusion rises, so too may consumption inequality, exacerbating difficulties in accessing various financial products. Li et al. (2020) also found a link between digital inclusive finance and household consumption, suggesting that financial exclusion may indeed influence consumption inequality. Corrado and Corrado (2017) similarly indicate that unequal consumption can be attributed to financial exclusion. Previous studies have further associated financial exclusion with income inequality, which often mirrors consumption inequality (Luo & Li, 2022; Pal & Pal, 2014).

Considering the influence of financial exclusion on consumption inequality in different settlement types, findings reveal that consumption inequality tends to be higher among financially excluded individuals in rural areas compared to those in urban centres. This supports the notion that rural areas often lack sufficient access to financial institutions, products, and services (Li et al., 2020), making it challenging for rural residents to conduct digital transactions or access essential credit to manage household expenses (Altunba̧s et al., 2007). As a result, many rural dwellers rely on individual money-lenders, payday loans, and pawnshops, which often charge exorbitant interest rates, further deepening poverty and, consequently, increasing consumption inequality in rural areas (Gunarsih et al., 2018). Supporting this finding, Jaber (2017) observes that rural residents are less likely to have access to bank accounts, savings, and credit facilities, which widens the consumption inequality gap between rural and urban populations. Similarly, Joassart-Marcelli and Stephens (2010) report that access to financial institutions, such as bank branches and ATMs, is significantly higher in urban areas than in rural regions, resulting in higher levels of consumption inequality among rural residents. Ofeh and Thalut (2018) also note that rising levels of financial exclusion contribute to inequality, especially in rural and peri-urban areas.

Regarding the impact of financial exclusion on consumption inequality based on the employment sector of the household head, findings indicate that households led by public sector workers or unemployed individuals are more susceptible to consumption inequality when both non-digital and digital financial exclusion are present. In contrast, financial exclusion among households led by self-employed or privately employed individuals results in only a moderate increase in consumption inequality. This supports the notion that self-employed and privately employed individuals generally have more autonomy over their financial decisions (Tiwari et al., 2022), making them more likely to achieve financial inclusion, which may lead to only modest consumption inequality. Currently, there is limited literature specifically examining the effect of financial exclusion on consumption inequality with respect to the employment sector of household heads. Nonetheless, as noted, any form of increased financial exclusion can elevate consumption inequality across various groups (Jabir, 2015; Joassart-Marcelli & Stephens, 2010). Overall, this discussion reinforces that financial exclusion significantly contributes to consumption inequality, and as rates of financial exclusion rise, so too are consumption inequality rates likely to increase.

Conclusion

The study concludes that non-digital financial exclusion exerts a stronger influence on consumption inequality in rural areas compared to urban areas, while digital financial exclusion significantly affects consumption inequality in both urban and rural settings. Households led by public sector workers or unemployed individuals experience greater consumption inequality with higher rates of financial exclusion. Overall, both non-digital and digital financial exclusion are contributors to increased consumption inequality. To bridge this consumption inequality gap, reducing financial exclusion in all forms among households is essential. It is recommended that the Government of Ghana, through the Ministry of Finance, create an environment conducive to inclusive finance by mandating account ownership for household heads in economic transactions. This measure would enable household heads to access a broader range of financial products, including loans and insurance, reducing instances where those without bank accounts are denied loans. Furthermore, both formal and informal workers should be educated on the advantages of using digital financial platforms for business, purchases, and savings, as these improve financial inclusion and subsequently reduce consumption inequality. The National Commission for Civic Education (NCCE) should introduce adult education programmes in various local languages on TV, radio, and social media, with a focus on rural communities. Additionally, post offices could play a role by accepting savings and facilitating other financial transactions, particularly in rural areas where financial services are limited.

While this study makes a significant contribution to theory, practice, and policy and corroborates findings from prior research, certain limitations should be acknowledged, as is the case with many studies. It focused on a specific country, Ghana, which may limit applicability to other socioeconomic contexts with different financial infrastructures. Additionally, it examines households led by a narrow range of employment types, potentially missing insights from other demographics, such as retirees or dual-income households. The cross-sectional design further limits the study by capturing data at a single point in time, preventing an understanding of how consumption inequality and financial exclusion evolve over time. Future research could address these gaps by conducting cross-country comparisons, incorporating additional dimensions, exploring a broader range of household types, and using longitudinal approaches to track trends over time.

Disclosure Statement

The author declares no competing interests.

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Data Availability

The data supporting this study will be made available upon reasonable request.

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