Digital Financial Services' Impact on Nigeria's Distribution of Humanitarian Aid

Nejo Dorcas Ibukuoluwa [1*], Sule Magaji [2], Ibrahim Musa [3]
[1] Sustainable Development Centre University of Abuja, Nigeria
[2] Department of Economics University of Abuja, Nigeria
[3] Department of Economics University of Abuja, Nigeria

* Corresponding Author: **Nejo Dorcas Ibukuoluwa**

Article Info

ISSN (online): 2583-8261
Volume: 04
Issue: 03
May-June 2025
Received: 03-03-2025
Accepted: 05-04-2025
Page No: 50-59

Abstract
This study assesses the impact of digital financial services on humanitarian aid distribution in Lagos State, Nigeria, focusing on the role of financial technology in enhancing efficiency, minimizing leakages, and ensuring timely disbursement to beneficiaries. Employing a quantitative research design with a stratified random sampling approach, data was collected from 400 respondents across four selected Local Government Areas (LGAs): Lagos Island, Alimosho, Mushin, and Ikorodu. A multiple regression model was utilized to analyze the relationship between humanitarian aid effectiveness (HAE) and factors such as financial inclusion (FI), digital financial services adoption (DFSA), barriers to financial inclusion (BFI), policy and regulatory environment (PRE), and socio-economic well-being (SEW). The findings reveal a weak positive correlation between digital financial services adoption and humanitarian aid effectiveness, with challenges such as network failures and high transaction costs significantly hindering effectiveness. Although digital financial services offer potential benefits, their impact is constrained by infrastructure limitations and user-related barriers. The study highlights the need for improved regulatory frameworks, enhanced service reliability, and targeted financial literacy programs to optimize the role of fintech in humanitarian aid distribution, ultimately ensuring timely and efficient aid delivery to beneficiaries in Lagos State.

DOI: https://doi.org/10.54660/IJSSER.2025.4.3.50-59

Keywords: Digital Financial Services, Humanitarian Aid Distribution and Quantitative Research Method

Introduction

The adoption of digital financial services (DFS) in humanitarian aid distribution has revolutionized the way assistance reaches beneficiaries, particularly in urban centres like Lagos State, Nigeria. As humanitarian organizations and governments strive to improve efficiency and accountability, financial technology (FinTech) has emerged as a pivotal tool in ensuring aid reaches those in need promptly. Digital payment systems, mobile banking, and blockchain solutions have been integrated into aid programs to enhance transparency and minimize fraud (Aker *et al*., 2016) [2]. In Lagos State, where rapid urbanization and socioeconomic disparities necessitate effective aid distribution, leveraging DFS can mitigate challenges associated with cash-based transfers and manual disbursement processes (Ismail, Musa & Magaji, 2025) [17].

Efficiency is a crucial factor in humanitarian aid distribution, and DFS plays a significant role in streamlining operations. Traditional cash-based aid distribution often faces logistical hurdles, bureaucratic bottlenecks, and corruption risks (Magaji, 2004) [25], leading to inefficiencies and delays (Bogan *et al*., 2019). By utilizing mobile money, prepaid debit cards, and electronic vouchers, financial technology enables humanitarian organizations to distribute funds quickly while reducing administrative

costs (Magaji & Aliyu, 2007) [21]. This shift enhances the responsiveness of aid programs, ensuring that beneficiaries receive timely assistance, particularly in crisis situations such as pandemics or natural disasters (Jack & Suri, 2016) [18].

Another critical concern in humanitarian aid distribution is the issue of leakages, where funds intended for beneficiaries are misappropriated or lost due to corruption and inefficiencies (Magaji & Musa, 2015) [22]. DFS mitigates this challenge by providing secure and traceable transactions, reducing opportunities for fraud (Dupas & Robinson, 2013) [9]. Blockchain technology, for instance, offers an immutable ledger that enhances accountability, ensuring that every financial transaction can be tracked and verified (Berg *et al*., 2020; Magaji, Musa & Ismail, 2025) [30]. In Lagos State, where concerns about corruption and mismanagement often hinder aid programs, leveraging digital solutions can significantly enhance transparency and public trust in humanitarian interventions.

Beyond efficiency and accountability, the role of DFS in ensuring the timely disbursement of funds to beneficiaries cannot be overstated. Delays in aid distribution can have severe consequences for vulnerable populations, particularly during emergencies (Magaji, & Saleh, 2010) [23]. FinTech solutions, such as mobile money platforms, enable real-time fund transfers that empower beneficiaries to access resources instantly (Magaji, Abubakar, 2010; Suri & Jack, 2016). The integration of biometric verification and digital identity systems further strengthens security, preventing duplication and unauthorized access to funds (Gelb & Clark, 2013). Consequently, digital financial services not only enhance speed but also reinforce equity and accessibility in humanitarian aid delivery (Igwe, Magaji & Darma, 2021) [15].

The adoption of DFS in humanitarian aid distribution presents significant advantages in improving efficiency, minimizing leakages, and ensuring timely disbursement of funds to beneficiaries in Lagos State, Nigeria. By leveraging financial technology, humanitarian organizations can overcome traditional challenges associated with cash-based aid distribution, fostering transparency and accountability (Magaji, Ayo, Ibrahim & Ali, 2019) [27]. While digital financial services offer promising solutions, addressing infrastructure limitations, digital literacy, and regulatory challenges remains essential to maximizing their impact.

2. Literature review and theoretical framework

2.1 Conceptual Review

Two important concepts need to be reviewed in this study; the concept of digital financial services and the concept of aid distribution.

2.1.1 Digital financial services

Digital Financial Services (DFS) encompass a broad range of financial activities delivered through digital platforms, including mobile banking, digital wallets, online lending, and blockchain-based transactions (Eke, *et al*, 2023) [11]. These services enhance financial inclusion by providing individuals and businesses access to financial resources without relying on traditional banking infrastructure (Ozili, 2022). DFS leverage technology to improve transaction efficiency, reduce costs, and enhance security, making financial services more accessible, particularly in underserved regions (World Bank, 2021) [38]. However, challenges such as cybersecurity risks, regulatory compliance, and digital literacy must be addressed to maximize the benefits of DFS (Mothobi & Grzybowski, 2019). As digital finance continues to evolve, collaboration among governments, financial institutions, and technology providers is crucial to fostering innovation and ensuring safe and inclusive financial ecosystems (Magaji, Darma & Igwe, 2021) [28].

2.1.2 Humanitarian AID distribution

Humanitarian aid distribution refers to the process of delivering essential resources such as food, water, medical supplies, and shelter to populations affected by crises, including natural disasters, conflicts, and pandemics. Effective aid distribution relies on coordinated efforts between governments, non-governmental organizations (NGOs), and international agencies to ensure that assistance reaches those in need efficiently and equitably (OCHA, 2021) [37]. Challenges such as logistical barriers, security threats, and corruption can hinder the effectiveness of aid delivery, necessitating the use of technology, data analytics, and transparent monitoring systems to improve efficiency (Smith *et al*., 2020). As humanitarian crises become more complex, innovations such as blockchain for supply chain tracking and artificial intelligence for resource allocation are increasingly being integrated into aid distribution strategies to enhance accountability and effectiveness (UNHCR, 2022) [36].

2.2 Theoretical Review

2.2.1 Financial intermediation theory

Financial Intermediation Theory explains the crucial role financial intermediaries, such as banks and investment institutions, play in bridging the gap between savers and borrowers by reducing transaction costs, mitigating risks, and improving information efficiency in financial markets (Magaji, Musa & Dogo, 2023 [29]; Musa, Magaji & Salisu, (2022) [31]. This theory suggests that intermediaries exist due to market imperfections, such as asymmetric information and high transaction costs, which they help overcome by pooling funds, diversifying risks, and monitoring borrowers more effectively than individual investors (Diamond, 1984 [8]; Gurley & Shaw, 1960) [13]. By facilitating efficient capital allocation, financial intermediaries contribute to economic growth and stability, making them essential to modern financial systems (Chinedu, Magaji & Musa, 2021 [4]; Magaji & Yahaya, 2012) [24].

2.3 Empirical Review

Vhikai *et al*. (2024) conducted a quantitative study using multiple regression analysis to examine the impact of digitalisation on the efficiency of humanitarian logistical operations in Zimbabwe. Based on survey responses from 286 participants in humanitarian aid organisations, the findings revealed strong positive associations between digitalisation components—such as communication effectiveness, cost reduction, automation, and supply-chain management—and improved humanitarian logistics. However, challenges such as knowledge-sharing barriers and cybersecurity threats were also identified. This research is relevant as it highlights the role of digital financial services and digitalisation in enhancing the efficiency of humanitarian aid distribution, particularly through improved coordination and operational effectiveness.

Munich *et al*. (2023) conducted a qualitative study using ten interviews with humanitarian agencies and private sector

representatives to examine the evolving landscape of cash and voucher assistance (CVA) amid financial technology advancements. The study explored how humanitarian innovation differs from private-sector innovation and identified key challenges in adopting new digital financial tools. Findings revealed that the diffusion of CVA fintech is hindered by internal and external capacities, regulatory constraints, and varying perceptions of innovation within the humanitarian sector. The study positioned digital CVA at the "ferment stage" of technological change, characterized by uncertainty and competition, suggesting that dominant designs may emerge over time. This research is relevant as it highlights the complexities of integrating digital financial services into humanitarian aid, offering insights into innovation bottlenecks and potential pathways for scaling adoption.

Juntunen *et al*. (2023) conducted a systematic literature review alongside two case-based evaluations to assess the potential and limitations of digital cash-based assistance (CBA) in humanitarian aid. While digital CBA offers advantages over traditional in-kind aid, such as increased efficiency and security, its effectiveness is highly context-dependent, influenced by factors such as digital infrastructure, financial market conditions, and beneficiary accessibility. The study provides a structured overview of digital CBA's benefits and challenges, aiding humanitarian organisations in pre-assessing suitable aid modalities. This research is relevant as it highlights the contextual considerations necessary for the effective deployment of digital financial services in humanitarian aid distribution.

Alsina and Eldridge (2025) examine the growing preference for multi-purpose cash transfers (CTs) over in-kind assistance in conflict-affected regions such as Somalia, South Sudan, Tigray, and Yemen. By gathering insights from humanitarian practitioners, the study highlights key considerations, including targeting effectiveness, internal operational support, inter-agency coordination, dignity preservation, and women's empowerment as beneficiaries. Despite constraints related to conflict dynamics, the research underscores the effectiveness of CTs in meeting beneficiary needs. This research is relevant as it provides insights into the practical challenges and strategic considerations for expanding digital financial services in humanitarian aid distribution.

Gao and Ren (2023) explore the relationship between digital finance and the financialization of small and medium-sized enterprises (SMEs) in China. Using registration data from 30 million enterprises, the study constructs a financialization index based on business scope text analysis and applies panel fixed-effects models. The findings reveal that digital finance significantly inhibits SME financialization by alleviating financing constraints, particularly for firms with higher liquidity needs. Additionally, SME financialization is linked to increased bankruptcy risk, while digital finance mitigates this risk by improving financial access. This research is relevant as it underscores the role of digital finance in stabilizing SME operations, which has implications for humanitarian aid distribution, where financial stability and accessibility are crucial.

While existing studies have explored the impact of digitalisation on humanitarian logistics (Vhikai *et al*., 2024), the adoption challenges of digital financial tools in cash and voucher assistance (Munich *et al*., 2023), and the context-specific effectiveness of digital cash-based assistance (Juntunen *et al*., 2023), there remains a gap in understanding how these digital financial services influence the long-term resilience and financial independence of aid recipients. Current research focuses on operational efficiencies, adoption barriers, and contextual dependencies but does not sufficiently address whether and how digital financial services contribute to sustainable financial inclusion and economic empowerment of beneficiaries beyond immediate aid distribution. Investigating this aspect would provide critical insights into the long-term impacts of digital financial solutions on humanitarian aid recipients, informing strategies for more sustainable interventions.

3. Methodology

3.1 Research Design

This study employs a quantitative research design using a survey approach to examine the impact of financial inclusion on humanitarian aid distribution in selected LGAs of Lagos State. The survey method is suitable as it facilitates the collection of structured responses from a broad range of humanitarian aid recipients, allowing for the analysis of trends, barriers, and socio-economic impacts. This design ensures the gathering of primary data with statistical rigour and supports the generalization of the study's findings.

3.1.1 Study Area

This study investigates financial inclusion in Lagos State, Nigeria, focusing on four Local Government Areas Lagos Island, Alimosho, Mushin, and Ikorodu. Although Lagos is a major financial hub, access to financial services remains uneven, especially among low-income and vulnerable groups. Each selected LGA reflects distinct challenges: Lagos Island faces exclusion despite its financial prominence; Alimosho struggles with infrastructural and socio-economic barriers; Mushin, dominated by informal activities, lacks formal financial services; and Ikorodu, as a growing peri-urban area, has limited access compared to inner-city regions. These LGAs were chosen to provide a comprehensive assessment of financial inclusion challenges across diverse economic and demographic contexts.

3.1.2 Determination of sample size

The total population of the sampled LGA are given in Table 3.1 below.

Table 1: Population of Samples LGAs (2022 Estimate)

LGA	Population (2022 estimate)
Lagos Island LGA	314,900
Alimosho LGA	1,953,500
Mushin LGA	935,400
Ikorodu LGA	781,500
Total	**3,985,300**

The sample size for this study is determined using Yamane's (1967) formula, which provides a statistically valid approach for estimating an appropriate sample size from a finite population. The formula is expressed as:

$$n = \frac{N}{1 + N\,(e^2)}$$

Where:
- n = Sample size
- N = Total population (3,985,300 for the selected LGAs)
- e = Margin of error (assumed at 5% or 0.05)

Substituting the values:

$$n = \frac{3985300}{1 + 3985300\ (0.05^2)} \approx \mathbf{400}$$

The calculated sample size is 400 respondents.

3.1.3 Sampling Procedure

This study employs a stratified random sampling technique to achieve a fair and proportional representation of respondents across the four selected LGAs in Lagos State. Given the heterogeneous nature of the population characterized by varying levels of financial inclusion, socio-economic backgrounds, and experiences with humanitarian aid stratified sampling ensures that each LGA is adequately represented. Using the proportional allocation method, the total sample size of 400 respondents is distributed among the LGAs according to their share of the overall population of 3,985,300, thereby enhancing the representativeness and generalizability of the study's findings.

$$n_i = \left(\frac{N_i}{N}\right) x\ n$$

Where:
- n_i = sample size for each LGA
- N_i = population of each LGA
- N = total population of the four LGAs
- n = total sample size (400)

Applying this formula, the sample size for each LGA is:
Lagos Island LGA:

$$n_i = \left(\frac{314900}{N3985300}\right) x\ 400\ \approx\ 32\ \text{respondents}$$

Alimosho LGA:

$$n_i = \left(\frac{1953500}{N3985300}\right) x\ 400\ \approx\ 196\ \text{respondents}$$

Mushin LGA:

$$n_i = \left(\frac{3935400}{N3985300}\right) x\ 400\ \approx\ 94\ \text{respondents}$$

Ikorodu LGA:

$$n_i = \left(\frac{781500}{N3985300}\right) x\ 400\ \approx\ 78\ \text{respondents}$$

After determining the sample size for each LGA, random selection will be used to choose individual respondents from each stratum. The random selection process ensures that all humanitarian aid recipients within the LGAs have an equal chance of being selected, reducing selection bias.

3.1.4 Questionnaire and measure of the variables

In designing the questionnaire, it is essential to align the survey items with the study's dependent and independent variables to ensure accurate data collection and analysis.

Dependent Variable:
- Humanitarian Aid Effectiveness – This represents the impact of financial inclusion on humanitarian aid delivery. It will be measured through indicators such as aid accessibility, timeliness of disbursement, reduction in leakages, and financial resilience of recipients.

Independent Variables:
- Financial Inclusion – Measured by respondents' access to formal financial services, including:
  i. Bank accounts, Mobile money services, Agent banking and Digital wallets
- Digital Financial Services Adoption – Examines how frequently respondents use fintech-based platforms for aid transactions.
- Barriers to Financial Inclusion – Identifies constraints such as Financial literacy levels, Infrastructure limitations (lack of mobile network coverage, distance to financial institutions) and Trust and perception of digital financial services
- Policy and Regulatory Environment – Assesses the extent to which financial regulations, government policies, and humanitarian agency guidelines support financial inclusion in aid delivery.
- Socio-Economic Well-Being – Measures the financial resilience, savings behaviour, and long-term economic empowerment of humanitarian aid recipients. This variable captures how access to financial services influences respondents' ability to manage financial shocks, save for future needs, and improve their overall economic stability. Key indicators include savings frequency, access to credit, income stability, and perceived financial security.

3.1.5 Validity Test

Validity refers to the extent to which the questionnaire accurately measures the intended variables in this study. To ensure that the research instrument captures the impact of financial inclusion on humanitarian aid delivery, three types of validity tests will be conducted:
- Content Validity – This assesses whether the questionnaire comprehensively covers all aspects of financial inclusion and humanitarian aid effectiveness. Experts in financial inclusion, humanitarian aid, and survey design will review the instrument to verify that the questions align with the study's objectives. Their feedback will be incorporated to refine unclear or ambiguous items.
- Construct Validity – This examines whether the questionnaire accurately reflects the theoretical constructs it aims to measure. Factor analysis will be conducted to determine whether the observed variables (survey questions) appropriately measure the underlying latent variables (financial inclusion, aid effectiveness, socio-economic well-being, etc.).
- Criterion Validity – This evaluates how well the questionnaire's measures correlate with external benchmarks. For instance, respondents' financial

inclusion levels will be compared with secondary data on financial service penetration in Lagos State to assess alignment with established trends.

A pilot study will be conducted with 20 respondents from the selected LGAs to test validity. Feedback from the pilot phase will be used to refine the questionnaire before full deployment.

3.1.6 Reliability Test

Reliability ensures the consistency and stability of the questionnaire's results over time. To verify reliability, Cronbach's Alpha coefficient will be used to test internal consistency. A Cronbach's Alpha value of 0.7 or higher will indicate acceptable reliability of the instrument.

Additionally, the test-retest method will be employed, where the same questionnaire is administered to a subset of respondents twice within a two-week interval. A high correlation between the two sets of responses will confirm the reliability of the instrument.

Table 2: Reliability Analysis

Variable	Cronbach'S Alpha
Humanitarian aid Effectiveness (HAE)	0.745
Financial Inclusion (FI)	0.790
Digital Financial Services Adoption (DFSA)	0.811
Barriers to Financial Inclusion (BFI)	0.747
Policy and Regulatory Environment (PRE)	0.886
Socio-economic well-being (SEW)	0.783

3.1.7 Ethical Consideration

This study will adhere to ethical research guidelines to protect the rights and well-being of participants. Key ethical considerations include:

- Informed Consent – Respondents will be provided with a detailed explanation of the study's purpose, their rights, and the voluntary nature of participation. A signed or verbal consent will be obtained before data collection.
- Confidentiality and Anonymity – Participants' personal data will be kept anonymous, and responses will only be used for academic purposes. No personally identifiable information will be recorded.
- Non-Maleficence – The study will ensure no harm comes to respondents, including psychological or social risks.
- Ethical Approval – Approval will be sought from a recognized ethics review board before conducting the survey.

3.2 Model Specification

To analyze the impact of financial inclusion on humanitarian aid effectiveness in the selected Local Government Areas (LGAs) of Lagos State, a multiple regression model will be employed. The dependent variable is humanitarian aid effectiveness (HAE), while the independent variables include financial inclusion (FI), digital financial services adoption (DFSA), barriers to financial inclusion (BFI), policy and regulatory environment (PRE), and socio-economic well-being (SEW).

The model is specified as follows:

$$HAE = \beta_0 + \beta_1 FI + \beta_2 DFSA + \beta_3 BFI + \beta_4 PRE + \beta_5 SEW + \varepsilon \quad (3.1)$$

Where;

- HAE = Humanitarian Aid Effectiveness
- FI = Financial Inclusion
- DFSA = Digital Financial Services Adoption
- BFI = Barriers to Financial Inclusion
- PRE = Policy and Regulatory Environment
- SEW = Socio-Economic Well-Being β1, β2, β3, β4, and β5 are coefficients to be estimated
- ε = error term.

This model allows for an empirical examination of how financial inclusion and related factors contribute to the effectiveness of humanitarian aid delivery. The coefficients (β_1–β_5) will indicate the extent to which each independent variable influences humanitarian aid effectiveness. Hypothesis testing will be conducted to determine the statistical significance of these relationships.

3.3 Estimation Technique

The study will utilize descriptive statistics and multiple linear regression analysis to examine the impact of financial inclusion on humanitarian aid effectiveness in selected LGAs of Lagos State. Descriptive statistics will summarize key data characteristics, including financial inclusion levels, adoption of digital financial services, and socio-economic well-being, using measures such as mean, standard deviation, and frequencies. Multiple linear regression analysis will assess the relationship between financial inclusion and humanitarian aid effectiveness, considering factors like aid accessibility, timeliness, and financial resilience. The model's significance will be tested using t-tests, R-squared values, and F-statistics, with SPSS (version 26) ensuring analytical accuracy. This approach aims to provide empirical insights to guide financial inclusion policies in humanitarian contexts.

4. Data presentation, analysis, and interpretation of results

4.1 Data Presentation

This section presents the demographic and socio-economic characteristics of the respondents, offering a comprehensive overview of the surveyed population. A total of 400 respondents across the four selected Local Government Areas (LGAs) in Lagos State participated in the study, with the distribution reflecting the stratified sampling approach: Lagos Island (32 respondents), Alimosho (196 respondents), Mushin (94 respondents), and Ikorodu (78 respondents). The data collected provides key insights into respondents' financial inclusion status, digital financial service adoption, barriers to financial inclusion, regulatory environment, and socio-economic well-being. These variables are essential for understanding the impact of financial inclusion on humanitarian aid effectiveness and will form the basis for further descriptive and inferential statistical analyses.

4.1.1 Demographic characteristics of respondents

Table 3: Gender

		Frequency	Percent
Valid	Male	206	51.5
	Female	194	48.5
	Total	**400**	**100**

Source: Author (2025)

Table 4.1 presents the gender distribution of the respondents. The sample is relatively balanced, with 206 respondents (51.5%) identifying as male and 194 respondents (48.5%) identifying as female. This near-equal representation ensures a diverse perspective on financial inclusion and humanitarian aid effectiveness, allowing for a more comprehensive analysis of potential gender-related differences in access to and utilization of financial services.

Table 4: Age Group

		Frequency	Percent
Valid	18-25	87	21.8
	26-35	78	19.5
	36-45	85	21.3
	46-55	67	16.8
	56 and above	83	20.8
	Total	**400**	**100**

Source: Author (2025)

Table 4.2 illustrates the age distribution of the respondents. The largest age group falls within the 18-25 years category, accounting for 21.8% (87 respondents) of the sample, followed closely by those aged 36-45 years (21.3%) and 56 and above (20.8%). The 26-35 age group comprises 19.5% (78 respondents), while the 46-55 age group represents 16.8% (67 respondents). This distribution reflects a diverse sample of respondents across different age brackets, enabling a nuanced analysis of how financial inclusion and humanitarian aid effectiveness vary across age groups.

Table 5: Educational Level

		Frequency	Percent
Valid	No formal education	115	28.7
	Primary education	108	27
	Secondary education	89	22.3
	Tertiary education	88	22
	Total	**400**	**100**

Source: Author (2025)

Table 4.3 presents the educational attainment of the respondents. The majority, 28.7% (115 respondents), have no formal education, highlighting a significant proportion of individuals who may face challenges in accessing and utilizing financial services due to literacy barriers. Respondents with primary education make up 27% (108 respondents), while those with secondary education account for 22.3% (89 respondents). Meanwhile, 22% (88 respondents) have attained tertiary education, indicating a relatively smaller group with advanced educational qualifications. This distribution underscores the importance of financial literacy initiatives in promoting financial inclusion, particularly among individuals with lower educational attainment.

Table 6: Employment Status

		Frequency	Percent
Valid	Unemployed	99	24.8
	Self-employed	111	27.8
	Employed (formal sector)	94	23.5
	Employed (informal sector)	96	24
	Total	**400**	**100**

Source: Author (2025)

Table 4.4 presents the employment status of respondents, providing insights into their economic engagement. The largest proportion, 27.8% (111 respondents), are self-employed, indicating a significant reliance on informal entrepreneurial activities for livelihood. 24.8% (99 respondents) are unemployed, suggesting potential economic vulnerability and dependency on humanitarian aid. Those employed in the formal sector constitute 23.5% (94 respondents), while 24% (96 respondents) work in the informal sector. The near-equal distribution between formal and informal sector employment highlights the diverse nature of income generation among respondents and suggests that financial inclusion strategies should account for both structured employment and informal economic activities.

Table 7: Household Size

		Frequency	Percent
Valid	1-3 people	136	34
	4-6 people	128	32
	7 and above	136	34
	Total	**400**	**100**

Source: Author (2025)

Table 4.5 presents the distribution of household sizes among respondents, highlighting variations in family structure. The data shows that 34% (136 respondents) live in small households of 1–3 people, suggesting a significant proportion of nuclear or single-person households. Similarly, 34% (136 respondents) belong to large households with 7 or more members, reflecting extended family living arrangements, which are common in many Nigerian communities. Meanwhile, 32% (128 respondents) fall within the moderate household size of 4–6 people. The relatively balanced distribution across all household sizes suggests that financial inclusion and humanitarian aid strategies should be tailored to accommodate the varying financial needs and dependency levels of both small and large households.

4.2 data analysis, test of hypotheses, and interpretation of results

This section presents the analysis and interpretation of the survey data, focusing on the relationship between financial inclusion and humanitarian aid effectiveness. The analysis involves both descriptive and inferential statistics.

Descriptive statistics summarize key characteristics of the respondents, while inferential analysis, including multiple linear regression, is used to examine the impact of financial inclusion on humanitarian aid delivery. The findings provide insights into access to financial services, digital financial adoption, barriers to financial inclusion, regulatory support, and the socio-economic well-being of aid recipients. The results are interpreted in line with the study objectives, highlighting key patterns and trends that inform policy recommendations and practical implications for humanitarian aid distribution in Lagos State.

4.2.1 Effectiveness of digital financial services in humanitarian aid distribution

Table 4.7a presents the model summary assessing the relationship between digital financial services adoption (DFSA) and humanitarian aid effectiveness (HAE). The R-value of 0.128 suggests a weak positive correlation between digital financial services adoption and humanitarian aid effectiveness. The R-squared value of 0.016 indicates that only 1.6% of the variation in humanitarian aid effectiveness is explained by digital financial services adoption. The adjusted R-squared value of 0.004 suggests that the model does not significantly improve explanatory power when adjusted for the number of predictors. The standard error of the estimate (2.67770) remains relatively high, indicating a substantial degree of unexplained variation.

Table 8: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.128[a]	.016	.004	2.67770
a. Predictors: (Constant), DFSA				

Table 4.7b provides the ANOVA results, which test the overall significance of the model. The F-statistic value of 1.322 and the corresponding p-value of 0.254 indicate that the model is statistically insignificant at the 5% level ($p > 0.05$). The regression sum of squares is 47.390, while the residual sum of squares is 2825.008, highlighting that most of the variance in humanitarian aid effectiveness is not explained by digital financial services adoption. This suggests that, collectively, the indicators of digital financial services adoption do not significantly enhance the effectiveness of humanitarian aid distribution.

Table 9: ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	47.390	5	9.478	1.322	.254[b]
	Residual	2825.008	394	7.170		
	Total	2872.397	399			
a. Dependent Variable: HAE						
b. Predictors: (Constant), DFSA						

Table 4.7c presents the regression coefficients, providing insight into the individual effects of different digital financial services adoption indicators on humanitarian aid effectiveness. Most of the variables are statistically insignificant, as evidenced by their high p-values (greater than 0.05). For example, receiving humanitarian aid through mobile money or bank transfers ($B = 0.320$, $p = 0.235$), frequency of using mobile money services ($B = 0.020$, $p = 0.838$), and perceived ease of using digital financial services ($B = -0.005$, $p = 0.960$) all show weak and statistically insignificant effects.

However, one variable—facing challenges while using digital financial services for humanitarian aid transactions ($B = 0.383$, $p = 0.023$)—is statistically significant at the 5% level ($p < 0.05$). This suggests that difficulties such as network failures, high charges, or fraud negatively impact humanitarian aid effectiveness. The Variance Inflation Factor (VIF) values remain close to 1, indicating no issues of multicollinearity.

Table 10: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	11.529	.767		15.022	.000		
	HUM_AID_MM_BK	.320	.269	.060	1.191	.235	.993	1.007
	MM_USE_FRQ	.020	.095	.010	.205	.838	.985	1.015
	DFS_EASY_USE	-.005	.093	-.003	-.050	.960	.987	1.013
	DFS_HUM_AID_CHAL	.383	.168	.115	2.281	.023	.979	1.021
	DFS_PREF_CASH	-.001	.096	-.001	-.011	.991	.981	1.019
a. Dependent Variable: HAE								

Where:

- HUM_AID_MM_BK – Have you ever received humanitarian aid through mobile money or bank transfers?
- MM_USE_FRQ – How often do you use mobile money services for transactions?

- DFS_EASY_USE – Do you find digital financial services (e.g., mobile banking, agent banking) easy to use?
- DFS_HUM_AID_CHAL – Have you ever faced a challenge using digital financial services for humanitarian aid transactions (e.g., network failure, high charges, fraud)?
- DFS_PREF_CASH – Do you prefer receiving humanitarian aid through digital financial services rather than cash?

The regression results indicate that digital financial services adoption, as a whole, does not have a statistically significant impact on humanitarian aid effectiveness ($p = 0.254$). However, the significance of challenges faced while using digital financial services ($p = 0.023$) suggests that inefficiencies and barriers in digital financial transactions may play a crucial role in limiting their effectiveness. Given the overall insignificance of the model, we fail to reject H02, implying that digital financial services adoption does not significantly enhance humanitarian aid distribution in the studied LGAs.

The findings indicate that simply having access to digital financial services does not automatically improve the effectiveness of humanitarian aid. While digital transactions are often promoted for their convenience and efficiency, challenges such as network failures, high transaction costs, and security concerns can limit their potential benefits. This suggests that policies aimed at improving digital financial services for aid distribution should focus on reducing technical barriers, increasing reliability, and enhancing user trust.

4.3 Discussion of Findings

The findings suggest that digital financial services adoption does not significantly enhance humanitarian aid effectiveness in the studied LGAs of Lagos State. The correlation between digital financial services adoption and aid effectiveness is weakly positive ($R = 0.128$), while the R-squared value (0.016) indicates that only 1.6% of the variation in aid effectiveness is explained by digital financial services adoption. Furthermore, the adjusted R-squared value (0.004) suggests minimal improvement when adjusting for predictors, and the F-statistic (1.322, $p = 0.254$) confirms the insignificance of digital financial services in affecting humanitarian aid effectiveness. This finding aligns with previous studies that highlight the limitations of financial technology in humanitarian settings (Dupas & Robinson, 2018; Jack & Suri, 2021).

Despite the growing adoption of digital financial services in developing economies, their effectiveness remains dependent on infrastructure, user capacity, and policy support. Dupas and Robinson (2018) observed that while mobile banking expanded financial access in Kenya, its effect on poverty reduction and welfare was constrained by transaction costs and inconsistent service delivery. Similarly, Jack and Suri (2021) found that mobile money services improved financial inclusion in East Africa but did not necessarily lead to better economic outcomes for the poorest populations. These findings suggest that digital financial services alone do not automatically enhance aid distribution but require improvements in operational efficiency and service reliability.

A crucial insight from the regression analysis is that key indicators of digital financial services adoption, such as mobile money usage frequency, perceived ease of use, and preference for digital transactions, do not significantly affect humanitarian aid effectiveness. This aligns with Van der Boor *et al*. (2020), who identified barriers such as low digital literacy, lack of trust, and weak regulatory frameworks in low-income countries. Additionally, Asongu and Nwachukwu (2018) found that despite the expansion of digital financial services in Africa, their impact on economic inclusion remained constrained by financial illiteracy and poor regulatory enforcement. These studies indicate that without addressing regulatory and user-related challenges, digital financial services will not substantially enhance humanitarian aid delivery.

Moreover, challenges such as network failures, high transaction costs, and fraud significantly impact humanitarian aid effectiveness ($p = 0.023$), underscoring the inefficiencies in digital transaction systems. This finding supports the argument by Chen and Jayadeva (2022) that unreliable networks and security concerns deter users from fully adopting digital financial services in developing countries. Similarly, Gwer *et al*. (2023) found that frequent transaction failures and hidden charges create barriers to financial inclusion, especially for marginalized populations reliant on aid. These findings emphasize the need for stronger regulatory measures, improved service reliability, and enhanced financial literacy programs to maximize the benefits of digital financial services in humanitarian aid distribution.

5. Conclusion, Recommendations

In conclusion, this study found that while digital financial services offer potential advantages for humanitarian aid distribution in Lagos State, their effectiveness is significantly hampered by infrastructural limitations, low digital literacy, and regulatory gaps. The adoption of these services did not demonstrably improve aid delivery, highlighting the need for a more comprehensive approach that addresses the unique challenges of the region. Simply introducing fintech solutions is insufficient; a holistic strategy is required to integrate these services effectively and ensure aid reaches vulnerable populations efficiently.

To optimize the role of digital financial services, it's recommended to prioritize improving infrastructure reliability, enhancing financial literacy, and strengthening regulatory frameworks. Reducing transaction costs and building trust through robust security measures are also crucial. Furthermore, aid distribution strategies should be tailored to the socio-economic diversity of the population, considering factors like education level and household size. By implementing these recommendations, stakeholders can unlock the transformative potential of fintech to enhance humanitarian aid distribution, ensuring timely and effective support for beneficiaries in Lagos State.

6. References

1. Aassouli D, Hajian A, Asutay M, Jureidini RR. Aligning sustainable finance and fintech to promote an integrated approach to refugee finance. Global Policy 2025;16(1):12–24. https://doi.org/10.1111/1758-5899.13482
2. Aker JC, Boumnijel R, McClelland A, Tierney N.

Payment mechanisms and antipoverty programs: Evidence from a mobile money cash transfer experiment in Niger. Economic Development and Cultural Change 2016;65(1):1–37. https://doi.org/10.1086/687578
3. Beck T, Demirgüç-Kunt A, Levine R. Financial institutions and markets across countries and over time: Data and analysis. World Bank Publications; 2020.
4. Chinedu CJ, Magaji S, Musa I. Empirical Analysis of the Role of Money Market Instruments on Economic Growth in Nigeria: 1994-2018. Lapai Journal of Economics 2021;5(2):24–37.
5. Cull R, Ehrbeck T, Holle N. Financial inclusion and development: Recent impact evidence. Focus Note 2014;92:1–12.
6. Demirgüç-Kunt A, Klapper L, Singer D, Ansar S, Hess J. The Global Findex Database 2017: Measuring financial inclusion and the fintech revolution. World Bank; 2018.
7. Demirgüç-Kunt A, Klapper L, Singer D, Ansar S, Hess J. The Global Findex Database 2017: Measuring financial inclusion and the fintech revolution. World Bank; 2018. https://doi.org/10.1596/978-1-4648-1259-0
8. Diamond DW. Financial intermediation and delegated monitoring. The Review of Economic Studies 1984;51(3):393–414. https://doi.org/10.2307/2297430
9. Dupas P, Robinson J. Why don't the poor save more? Evidence from health savings experiments. American Economic Review 2013;103(4):1138–1171. https://doi.org/10.1257/aer.103.4.1138
10. EFInA. Access to financial services in Nigeria 2020 survey. Enhancing Financial Innovation & Access; 2020. https://www.efina.org.ng
11. Eke CI, Osi UM, Magaji S, Musa I. State Control of Digital-Fiat-Electronic Currency Transmission in an Economy: The Case of Hybrid Currency. Asian Journal of Economics, Finance and Management 2023:92–96.
12. Fayyad A, Al-Sinnawi A. Evaluating the Palestinian Monetary Authority's financial inclusion strategy for visually impaired individuals. Journal of Financial Regulation and Compliance 2024;32(3):289–305. https://doi.org/10.1108/JFRC-03-2023-0034
13. Gurley JG, Shaw ES. Money in a theory of finance. Brookings Institution; 1960.
14. Hennessy C, Jones S, Okun O. Aligning donor and recipient priorities in official development assistance: A systematic review. Development Policy Review 2023;41(5):e12567. https://doi.org/10.1111/dpr.12567
15. Igwe GU, Magaji S, Darma NA. Analysis of the impact of financial development indicators of the banking, insurance and pension sectors on economic growth in Nigeria. Focus on Research in Contemporary Economics 2021;2(2).
16. International Federation of Red Cross and Red Crescent Societies (IFRC). Principles and rules for humanitarian assistance; 2020. https://www.ifrc.org
17. Ismail Y, Musa I, Magaji S. Analysis of the Impact of Financial Inclusion on Small and Medium Enterprises (SMEs) in Nigeria. MSI Journal of Economics and Business Management 2025;2(2):10–20. https://doi.org/10.5281/zenodo.14907488
18. Jack W, Suri T. The long-run poverty and gender impacts of mobile money. Science 2016;354(6317):1288–1292. https://doi.org/10.1126/science.aah5309
19. Kim S, Lee J, Park H. Public attitudes toward foreign aid in recipient countries: Evidence from a conjoint experiment in seven developing countries. World Development 2024;157:105948. https://doi.org/10.1016/j.worlddev.2024.105948
20. Klapper L, Singer D. The opportunities and challenges of digital financial inclusion. In: Agarwal R, Kose EK, Stocker M, editors. Advances in economics and econometrics: Eleventh World Congress. Cambridge University Press; 2017. p. 179–210.
21. Magaji S, Aliyu CU. Micro Credit and Women Empowerment in Bauchi State: the role of community Banking. Issues in Economics 2007;2:162–168.
22. Magaji S, Musa I. Endemic Corruption and Nigeria's Underdevelopment. Abuja Journal of Business and Management 2015;1(4):119–125.
23. Magaji S, Saleh SA. The Role of Scale Industries in the Economic Development of Nigeria. Abuja Journal of Banking and Finance 2010;2(2):11.
24. Magaji S, Yahaya H. Portrait of Low Savings in Africa. 2012. Available from: pages.au.int/…/Magaji_SPORTRAITOF-LOW-SAVINGS-IN-AFRI
25. Magaji S. Introduction to Project Evaluation. Sanitex Press; 2004.
26. Magaji S, Abubakar SS. Micro-Finance Institutions in Nigeria: Outreach And Sustainable. Abuja Journal of Administration and Management 2010;7(1):130–143.
27. Magaji S, Ayo AA, Ibrahim M, Ali S. Relative Impact of Monetary Instrument on Economic Growth in Nigeria. Lapai Journal of Economics 2019;3(2):93–118.
28. Magaji S, Darma NA, Igwe GU. Testing the Supply-leading and Demand-following Hypothesis for Financial Development and Economic Growth – A Case of the Nigerian Banking System. GSJ 2021;9(12).
29. Magaji S, Musa I, Dogo SS. Analysis of the Impact of Banking Sector Credits on the Real Sector in Nigeria. International Journal of Management and Business Applied 2023;2(1):12–20.
30. Magaji S, Musa I, Ismail Y. Assessing the Impact of Income Inequality on Poverty Level in Nigeria Using Auto Regressive Distributed Lag Model. New Advances in Business, Management and Economics 2025;3(7):148–166. https://doi.org/10.9734/bpi/nabme/v3/1480
31. Musa I, Magaji S, Salisu A. Relationship between Financial Inclusion and Economic Growth: Evidence from ARDL Modeling. Focus on Research in Contemporary Economics (FORCE) 2022;3(2):395–413.
32. Omata N. Refugee livelihoods: The role of humanitarian assistance in refugee economies. Journal of Refugee Studies 2022;35(2):345–362. https://doi.org/10.1093/jrs/feab045
33. Omenihu CM, Brahma S, Katsikas E, Vrontis D, Siachou E, Krasonikolakis I. Financial inclusion and poverty alleviation: A critical analysis in Nigeria. Sustainability 2024;16(19):8528. https://doi.org/10.3390/su16198528

34. Scharwatt C, Williamson C. Mobile money crosses borders: New remittance models in West Africa. GSMA; 2015. https://www.gsma.com
35. Suri T, Jack W. The role of mobile money in financial inclusion and economic development. Science 2017;356(6340):377–380.
36. United Nations High Commissioner for Refugees (UNHCR). Humanitarian action for refugees and displaced communities; 2022. https://www.unhcr.org
37. United Nations Office for the Coordination of Humanitarian Affairs (OCHA). Global Humanitarian Overview 2021; 2021. https://www.unocha.org
38. World Bank. Financial inclusion: Overview; 2021. https://www.worldbank.org/en/topic/financialinclusion/overview
39. World Bank. Financial inclusion overview; 2022. https://www.worldbank.org/en/topic/financialinclusion/overview