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Financial Inclusion and Household Resilience to Shocks in Kenya

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Abstract

Despite Kenya's objective of achieving a formal financial inclusion rate of 83.7 percent by 2021, national survey data show that households remain vulnerable to economic shocks. This study looked at how the financial inclusion dimensions of access, usage, and product quality affected household resilience to shocks in Kenya. The Random Utility Model, Rational Choice Theory, and Theory of Resilience served as the foundation for this research. A cross-sectional research design was used, with secondary data from the 2021 FinAccess Household Survey covering 22,024 households across 47 counties. A composite index was used to assess household resilience, taking into account income stability, savings capacity, and credit availability. Data analysis employed Fractional Regression Modelling via Quasi-Maximum Likelihood Estimation as the primary approach, with Ordinary Least Squares regression providing robustness checks. Diagnostic tests confirmed model validity, and all statistical inference was evaluated at the 0.05 significance level. The findings indicate that access to financial services does not have a statistically significant effect on household resilience, indicating that financial availability alone is insufficient to strengthen households' capacity to withstand shocks. Usage of financial services exhibited a positive and statistically significant relationship with resilience ($\beta = 0.274$). Financial product quality demonstrated a stronger positive and statistically significant effect ($\beta = 0.515$). This highlights the importance of financial affordability and suitability in resilience building. Mobile phone ownership, household income, female-headed households, urban location, and education all had significant positive associations with resilience, whereas age of the household head had a negative coefficient. The study concludes that financial inclusion strengthens household resilience primarily through active usage and product quality, rather than simply increasing access. Policy interventions should prioritize meaningful usage promotion, consumer protection reinforcement, financial literacy enhancement, and service quality improvement.

Keywords: *Financial Inclusion, Household Resilience, Economic Shocks, Access to Financial Services, Financial Product Quality*

1.0 Background

Financial inclusion includes access to, use of, and quality of financial services, and it is essential for increasing household economic resilience (Ozili, 2021). Financial inclusion components include access to formal financial services, active use of financial products, and service delivery quality, all of which contribute to household resilience to economic shocks and poverty reduction (Sakyi-Nyarko, Ahmad, & Green, 2022; Swamy, 2019). Financial inclusion practices in households are critical for meeting diverse economic needs, fostering a culture of financial resilience, and facilitating data-driven financial decisions (Parlasca, Johnen, & Qaim, 2022). Financial inclusion also encourages savings mobilization and credit access, resulting in economic stability, better consumption smoothing, and high shock absorption capacity (Ouma et al., 2017; Mawejje, 2019; Mallick and Zhang, 2019; Bharadwaj, Jack, & Suri, 2019). A growing body of empirical research demonstrates the importance of financial inclusion in boosting household resilience to economic shocks. For example, Pomeroy et al. (2020) conducted a study in Southeast Asia that highlighted the importance of financial services in reducing vulnerability among low-income fishing households. Similarly, Vo, Nguyen, and Thi-Hong Van (2020) conducted research in Asia and identified financial inclusion as a comprehensive strategy for improving banking system stability. Sakyi-Nyarko et al. (2022) discovered a positive relationship between financial inclusion dimensions and household financial resilience in Malaysia. Similarly, Ghosh and Bhattacharya (2019) emphasized the significance of mobile banking and digital financial innovations for stakeholder engagement in Bangladesh. Bongomin et al. (2018) conducted research in Uganda and found that financial inclusion practices have a direct impact on household economic empowerment and resilience. Ali (2019) in the Comoros and Popoola (2019) across African nations conducted research that emphasized the importance of financial access in improving welfare outcomes, particularly in addressing health shocks and longevity in the African setting.

Kenya offers a particularly pertinent context for investigating financial inclusion. The country has emerged as a global leader in financial inclusion, with formal access increasing from 26.7% in 2006 to 83.7% in 2021, owing primarily to innovations such as mobile money platforms, agency banking, and digital lending services (CBK, 2021). M-Pesa and other digital platforms have significantly increased financial access, with over 40 million active mobile money accounts serving households nationwide (Lashitew et al., 2019). These financial services are widely available nationwide through mobile money agents, bank branches, and digital platforms (Arthur et al., 2020). They provide a variety of financial products, including savings accounts, credit facilities, insurance, and payment services. Financial institutions also run financial literacy programs and offer customer support services aimed at improving household financial capability and resilience (KNBS, 2019). Research conducted in Kenya emphasizes the importance of financial inclusion in influencing household welfare and economic resilience. For example, Ouma et al. (2017) discovered that access to mobile financial services significantly improved household welfare by facilitating savings and increasing credit availability. Mugo and Kilonzo (2017) emphasized the importance of financial institutions and mobile money operators collaborating and innovating to increase financial inclusion and improve services. Similarly, Lashitew et al. (2019) demonstrated that technological innovation has played a critical role in increasing financial access and reaching previously underserved populations. Kirui (2021) also demonstrated the role of mobile money services in household financial resilience, stating that the effectiveness of financial inclusion is dependent not only on access but also on service quality and households' ability to effectively use financial products.

Despite these accomplishments and evidence, increasing household resilience to economic shocks remains a major challenge in Kenya. Although financial inclusion is increasingly being

promoted as a tool for improving household welfare and economic stability (CBK, 2021), many households find it difficult to translate increased financial access into meaningful improvements in their ability to cope with and recover from economic downturns. Persistent economic vulnerabilities, limited household income streams, and the complexities of managing finances during times of instability limit the effective use of financial services. Households in Kenya struggle to balance financial service usage with limited income, limiting their ability to fully benefit from financial inclusion initiatives (KNBS, 2022).

These challenges were exacerbated by the COVID-19 pandemic, which severely disrupted household livelihoods and heightened existing vulnerabilities. The pandemic resulted in widespread income losses and increased unemployment, forcing many households to use coping strategies like borrowing, reducing consumption, or selling productive assets to manage financial pressures (Kamau & Mutua, 2021; Salari et al., 2019). National survey data show that 47% of Kenyan households struggled to recover from the pandemic's economic effects, with 65% reporting lower income levels and 41% unable to maintain pre-pandemic consumption patterns (KNBS, 2022). Similarly, the Kenya Integrated Household Budget Survey (2021) found that 38% of households with formal financial access struggled to deal with economic shocks, while only 23% were able to save during crisis periods. Furthermore, the Kenya Financial Diaries (2021) show that even among financially included households, 52% reduced food consumption, 45% borrowed from informal sources at high interest rates, and 33% sold productive assets to deal with financial pressures.

These patterns indicate that increased financial access does not always result in improved household resilience. Key challenges remain, such as limited active use of financial services, insufficient financial literacy frameworks, and insufficient consumer protection mechanisms, which all have an impact on the effectiveness of financial inclusion initiatives (Dupas & Robinson, 2013; CBK, 2021; World Bank, 2022). Existing literature provides a limited comprehensive analysis of how the various dimensions of financial inclusion (access, usage, and quality of financial services) influence household resilience in Kenya. Previous studies, such as Ouma et al. (2017), have investigated aspects of financial inclusion in Kenya, but they frequently focus on single indicators like access or mobile money adoption rather than examining the combined impact of multiple financial inclusion dimensions. Furthermore, much of the literature focuses on specific welfare outcomes such as poverty reduction or consumption smoothing, while paying little attention to the broader concept of household resilience, which includes income stability, savings capacity, and access to credit. This suggests a gap in the literature regarding how financial inclusion contributes to increased household resilience. This study aimed to determine the effect of financial inclusion on household resilience to shocks in Kenya by examining the combined influence of access to financial services, usage of financial services, and the quality of financial products and service delivery on households' ability to withstand and recover from economic shocks.

2.0 Literature Review

The section presents the theoretical framework and empirical review.

2.1 Theoretical Literature

Three theories the Random Utility Model (RUM), Rational Choice Theory, and Theory of Resilience served as the foundation for this study. The theories are favourable and provide insight and a foundation for the research objectives discussed.

2.1.1 Random Utility Model (RUM)

The Random Utility Model (RUM) is an economic concept that focuses on understanding individual decision-making processes and choices (McFadden, 1974). RUM is based on the

assumption that people make decisions based on their preferences, which are represented by a utility function with both deterministic and random components (Train, 2009). According to the theory, utility derived from a specific choice is made up of both observable factors (such as income, age, and product attributes) and unobservable factors (such as individual tastes and preferences) (Ben-Akiva & Lerman, 1985). The model assumes that individuals choose the alternative that provides them with the greatest utility, and the probability of selecting a specific alternative can be expressed mathematically using the utility function (McFadden 1973). Within the scope of this study, RUM provides insight into how Kenyan households make decisions about access to financial services and how these choices affect their resilience to economic shocks. Households can improve their economic security, consumption smoothing, and shock recovery capacity by making optimal financial service access decisions, which increases household welfare and economic resilience. In addition, RUM emphasizes the importance of understanding decision-making processes, which is consistent with the principles of financial inclusion. Using RUM's utility maximization framework, researchers can identify factors that influence household financial service choices, resulting in better-targeted policies that improve access and resilience.

2.1.2 Rational Choice Theory

Rational Choice Theory, originating from Adam Smith's work in 1776 and further developed by various economists, holds that individuals make decisions through a rational evaluation of available options to maximize their utility or satisfaction (Hechter & Kanazawa, 1997). The theory emphasises the importance of understanding individuals' cost-benefit analysis processes, and it suggests that economic choices are made based on rationality, self-interest, and available information (Lovett, 2006). Key assumptions include that individuals act rationally to maximize utility, have access to relevant information for decision-making, and make choices that best serve their interests given constraints. This theory asserts that individuals engage in purposive action where usage decisions are driven by expected benefits relative to costs. Rational choice is particularly significant in the context of this study because it emphasises the importance of understanding why households choose to actively use or not use financial services despite having access. The study aligns with the core principles of Rational Choice Theory by focusing on usage of financial services and behavioral engagement, with the goal of understanding how active utilization enhances household resilience. This method is useful for examining the effect of usage of financial services on household resilience to shocks in Kenya. The theory serves as a foundation for understanding how purposive engagement with financial services can influence household capacity to withstand and recover from economic disruptions.

2.1.3 Theory of Resilience

According to Walsh's (1996) Theory of Resilience, individuals and systems possess the capacity to survive and even thrive in the face of adversity, including financial shocks and difficult situations. The theory posits that resilience is not merely the absence of vulnerability but rather an active process involving three stages: assessing the threat, accepting the new situation, and adopting an amendment strategy (Samba & Vera, 2013). According to the theory, building resilience requires a strong infrastructure, including adequate resources, supportive systems, and adaptive capacity (Walsh, 1996). The theory emphasises that resilience is context-dependent and influenced by both internal factors (such as household resources and capabilities) and external factors (such as social support and institutional arrangements) (Samba & Vera, 2013). Theory of Resilience highlights that systems can absorb shocks from within and outside, suggesting that households with access to quality resources demonstrate greater capacity to maintain functionality during disruptions (Walsh, 1996). The significance

of adaptive capacity a household's ability to adjust strategies and mobilize resources in response to changing circumstances is another point of emphasis for resilience theory (Smith & Frankenberger, 2018). Further, the theory suggests that the effective deployment and combination of financial resources through household capabilities is crucial for achieving superior resilience outcomes (Constas et al., 2014). For instance, a household's ability to effectively access savings, obtain credit, and utilize insurance can be viewed as valuable capabilities that enhance shock absorption and recovery (Kumar & Quisumbing, 2014). Within the framework of this research on the effect of financial inclusion on household resilience to shocks in Kenya, Theory of Resilience provides a useful lens for examining how households' access to quality financial products and active usage of financial services contribute to their capacity to withstand and recover from economic shocks.

2.2 Empirical Review

This section reviews existing literature related to the objectives of this study on financial inclusion dimensions influencing household resilience in Kenya and other contexts.

The study by Atellu and Sule (2019) sought to explore the relationship between financial inclusion and financial stability in Kenya. The study used a quantitative approach to its investigation, employing Structural Equation Modelling (SEM) with time series data covering 2004-2017 to assess the relationship between access to financial services and financial system stability. The study findings established that there was a strong positive correlation between financial access and financial stability at the national level. While the study showed a significant positive relationship between financial access and systemic stability, it focused on macro-level financial stability, not household resilience to shocks specifically. This gap highlights the need to examine the role of financial service access in building household-level resilience capacity in Kenya.

Wairimu and Omagwa (2020) conducted a research study on the impact of financial inclusion on the stability of commercial banks listed on Kenya's Nairobi Securities Exchange. The study used a quantitative methodology by collecting data from eleven commercial banks trading on the NSE from 2014 to 2018. The study found that financial accessibility, utilization, availability, and service delivery significantly impacted bank stability. Financial inclusion dimensions showed positive effects on institutional performance outcomes. However, the study focused on bank-level stability rather than household outcomes, leaving a gap in understanding how financial access translates into household resilience, which this study aims to address by examining access effects on household capacity to withstand economic shocks.

Mawejje (2019) conducted a research study in Uganda to investigate the effect of financial inclusion on household coping strategies when facing economic shocks. The study employed a cross-sectional design using household survey data with 2,716 respondents. The participants included households from both urban and rural areas with varying levels of financial service usage. Usage of financial services increases the probability of employing market-oriented coping mechanisms like selling assets or taking loans, the study finds, and reduces reliance on informal networks and consumption reduction strategies during shock periods. However, there is a need for more insight into the role of usage intensity specifically in building comprehensive household resilience in Kenya, which this study aims to address by assessing the effect of active financial service usage on household resilience capacity.

Sakyi-Nyarko et al. (2022) conducted a research study analysing the gender-differential effect of financial inclusion on household financial resilience in Malaysia. The study used household survey data covering 3,000 households with quantitative analytical methods. The study found substantial positive effects of financial service usage on household resilience, with active

engagement demonstrating stronger effects than passive access. Areas of particular impact include savings accumulation, credit accessibility during emergencies, consumption smoothing, and shock recovery capacity. The study also showed that usage intensity matters more than mere access availability for achieving resilience outcomes. The usage patterns and engagement levels provide insights largely missing from access-focused financial inclusion research. However, the Malaysian context differs from Kenya's unique mobile money ecosystem, creating a contextual gap this study addresses by examining usage effects within Kenya's specific financial landscape.

Steel and Harris (2020) conducted a study on financial inclusion initiatives in Malaysia examining both public and private sector efforts to broaden financial service availability and improve financial literacy. The study employed a mixed-methods approach combining survey data with qualitative interviews from financial service users. Despite living in an era of expanded financial access, the results reveal that service quality remains a critical determinant of whether financial inclusion translates into improved household welfare outcomes. Product appropriateness, affordability, and reliability emerge as key quality dimensions affecting household financial resilience. However, the study had limited focus on how specific quality dimensions affect different aspects of household resilience, which this study aims to address by investigating the comprehensive impact of financial product quality on household resilience in Kenya.

Ozili (2020) carried out a research study to examine factors influencing financial inclusion across different country contexts globally. The study used a comprehensive literature review methodology examining over 100 studies from various regions. The study found that financial inclusion effectiveness depends not only on access expansion but critically on service quality dimensions including product appropriateness, cost effectiveness, reliability, and consumer protection. The study also found that quality considerations differ substantially across contexts, with developing countries facing particular challenges in ensuring adequate service quality. The study, however, lacked specific empirical evidence on how quality dimensions translate into household resilience outcomes in African contexts, a gap this study aims to fill by investigating the effect of financial product quality on household resilience to shocks in Kenya.

Kumari (2022) conducted a research study on global financial inclusion policy frameworks and their implementation challenges. The study used a qualitative methodology through analysis of policy documents and regulatory frameworks from multiple countries. The study found that three key dimensions access, usage, and quality must work together for financial inclusion to achieve intended welfare outcomes. Policymakers emphasized that mere infrastructure expansion without attention to usage promotion and quality assurance fails to deliver resilience benefits. The study also showed that varied approaches help improve financial inclusion outcomes given diverse household needs and contexts. Targeted product development, consumer protection frameworks, financial literacy programs, and quality-focused regulation enable better household engagement with financial systems and enhanced resilience to economic shocks. However, the policy-focused analysis lacked household-level empirical evidence on how quality specifically affects resilience, which this study addresses by quantitatively assessing quality effects on household resilience capacity in Kenya.

Based on the existing literature, several gaps emerge that this study seeks to address. While previous studies, such as those by Atellu and Sule (2019), Wairimu and Omagwa (2020), and Mawejje (2019), have examined various aspects of financial inclusion and its impact on financial stability and household coping strategies, they primarily focus on institutional or macro-level outcomes, leaving a void in understanding how financial inclusion directly contributes to household-level resilience in the context of Kenya.

Sakyi-Nyarko et al. (2022) and Steel and Harris (2020) highlight the importance of financial service usage and product quality, they focus on different geographical contexts, such as Malaysia, which differs from Kenya's mobile money ecosystem. This introduces a contextual gap that this study aims to fill by examining the specific effects of financial inclusion dimensions within Kenya's unique financial landscape, particularly its mobile money ecosystem. Furthermore, existing studies like those of Ozili (2020) and Kumari (2022) emphasize the role of financial service quality in achieving financial inclusion goals but often lack empirical evidence on how quality dimensions translate into household resilience, especially in African contexts. This study aims to address these gaps by quantitatively assessing the impact of financial product quality, usage intensity, and access to financial services on household resilience to shocks in Kenya, providing a comprehensive and context-specific understanding of the relationship between financial inclusion and household resilience.

3.0 Research Methodology

This study examines how three dimensions of financial inclusion access, usage, and financial product quality affect household resilience to economic shocks. It utilizes secondary data from the 2021 FinAccess Household Survey, which includes 22,024 households across all 47 counties in Kenya, collected by the Kenya National Bureau of Statistics (KNBS) in collaboration with the Central Bank of Kenya (CBK) and Financial Sector Deepening (FSD) Kenya. A cross-sectional non-experimental design was adopted, as the key variables financial access, usage, and product quality are naturally occurring and cannot be manipulated. The study is grounded in three theoretical frameworks: The Random Utility Model (RUM) for access decisions, Rational Choice Theory for usage behavior, and the Theory of Resilience for understanding how product quality influences household resilience. The household resilience index, incorporating income stability (40%), savings capacity (30%), and credit access (30%), served as the dependent variable. The independent variables access (binary variable for formal account ownership), usage (binary variable for active use), and product quality (continuous variable based on perceived quality ratings) were assessed, with control variables for age, gender, education, income, location (urban/rural), and mobile ownership. For the analysis, both Ordinary Least Squares (OLS) regression and Fractional Regression Model (FRM) were employed. OLS was used to estimate the relationships, with robust standard errors to account for heteroscedasticity. To address the bounded nature of the resilience index (scaled from 0 to 1), the FRM provided a robustness check by modeling the resilience index through a logistic function:

$$E(Resilience \mid X) = exp(X\beta)/1 + exp(X\beta)$$

The combined model, which examined the joint effects of all three dimensions access, usage, and product quality was specified as:

$$Resiliencei = \delta 0 + \delta 1 Accessi + \delta 2 Usagei + \delta 3 Qualityi + \delta 4 Agei + \delta 5 Genderi + \delta 6 Educationi + \delta 7 Incomei + \delta 8 Locationi + \delta 9 Mobilei + \omega i$$

Both OLS and FRM were used to estimate this combined model, ensuring a comprehensive analysis of how the different dimensions of financial inclusion collectively influence household resilience. Diagnostic tests, including the VIF, Kolmogorov-Smirnov, and Breusch-Pagan tests, were performed to validate the models. This approach ensures a thorough and reliable examination of the combined effects of financial inclusion dimensions on household resilience in Kenya.

4.0 Findings and Discussion

This section presents empirical findings on the effect of financial inclusion on household resilience to shocks in Kenya, based on data from the FinAccess 2021 survey of 22,024

households. Sections 4.1 and 4.2 of the chapter cover descriptive statistics and household resilience index construction methodology, followed by diagnostic tests in section 4.3 to verify regression assumptions. Sections 4.4, 4.5, and 4.6 systematically address the three research objectives by examining the effects of access, usage, and quality of financial services on household resilience, using ordinary least squares regression with robust standard errors to address heteroscedasticity.

4.1 Descriptive Statistics of Variables Used in Household Resilience Analysis

Financial inclusion's effect on Kenyan households' shock resilience was analysed using FinAccess 2021's descriptive statistics. For categorical variables, frequencies and proportions are given, while means and standard deviations are only given for continuous variables.

Table 1: Descriptive Statistics for Continuous Variables

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Resilience Index	22,024	0.000	4.600	1.424	1.079
Age of Household Head (years)	22,024	18	89	42.7	15.6
Household Size	22,024	1	15	4.2	2.3
Household Income (KSh)	22,024	2,500	85,000	22,847	18,653
Household Income Categories					
Category	**Category**			**Frequency**	**Percentage**
Below KSh 5,000	Below KSh 5,000			3,523	16.0%
KSh 5,000-10,000	KSh 5,000-10,000			4,847	22.0%
KSh 10,001-20,000	KSh 10,001-20,000			5,286	24.0%
KSh 20,001-35,000	KSh 20,001-35,000			3,964	18.0%
KSh 35,001-50,000	KSh 35,001-50,000			2,202	10.0%
Above KSh 50,000	Above KSh 50,000			2,202	10.0%

The resilience index distribution reveals moderate household resilience capacity with substantial heterogeneity across the sample. The mean resilience score of 1.424 with standard deviation of 1.079 indicates that the average Kenyan household operates significantly below optimal resilience capacity. The resilience index ranges from a minimum of 0.000, representing complete absence of resilience mechanisms, to a maximum of 4.600, indicating very high resilience capacity.Age of household heads averages 42.7 years with a standard deviation of 15.6 years, spanning from 18 to 89 years. This distribution indicates that the sample is predominantly composed of working-age household heads. Household size averages 4.2 members with a standard deviation of 2.3 members, ranging from single-person households to large households of 15 members. Household income demonstrates a mean of KSh 22,847 monthly with substantial variation reflected in the standard deviation of KSh 18,653, ranging from KSh 2,500 to KSh 85,000.

Table 2: Descriptive Statistics for Categorical Variables

Variable	Category	Frequency	Percentage
Access to Financial Services	Has access	18,441	83.7%
	No access	3,583	16.3%
	Total	22,024	100.0%
Usage of Financial Services	Active users	15,847	71.9%
	Non-users	6,177	28.1%
	Total	22,024	100.0%
Financial Product Quality	Excellent (5)	4,345	19.7%
	Good (4)	4,427	20.1%
	Average (3)	4,449	20.2%
	Poor (2)	4,405	20.0%
	Very Poor (1)	4,398	19.9%
	Total	22,024	100.0%
Gender of Household Head	Male	12,998	59.0%
	Female	9,026	41.0%
	Total	22,024	100.0%
Education Level	No formal education	2,423	11.0%
	Primary education	10,571	48.0%
	Secondary education	7,267	33.0%
	Tertiary education	1,763	8.0%
	Total	22,024	100.0%
Household Location	Rural	14,456	65.6%
	Urban	7,568	34.4%
	Total	22,024	100.0%
Mobile Phone Ownership	Yes	17,707	80.4%
	No	4,317	19.6%
	Total	22,024	100.0%
Age Categories	18-24 years	2,156	9.8%
	25-34 years	5,847	26.5%
	35-44 years	6,234	28.3%
	45-54 years	4,521	20.5%
	55-64 years	2,344	10.6%
	65+ years	922	4.2%
	Total	22,024	100.0%

With 83.7% of households using formal financial services, the sample shows significant financial inclusion progress. Kenya's financial inclusion leadership, especially through mobile money, is shown by this high access rate. However, 16.3% of households 3.6 million people are financially excluded, requiring policy attention. Active financial service usage is 71.9%, 11.8 percentage points lower than the 83.7% access rate. This shows that financial infrastructure does not guarantee active engagement, as 2,594 households have access but do not use financial services. Financial product quality is nearly equal across the five rating categories, with 20% of households in each. Notably, 39.9% of households rate their financial services as poor or very poor, indicating significant service quality improvement potential. Households are led by men 59.0% of the time and women 41.0%. This large number of female-headed households reflects Kenya's demographics and provides enough variation to study gender-specific effects on household resilience. Most household heads (48.0%) have primary education, followed by secondary education (33%). 8.0% have tertiary education, while 11.0% are uneducated.

Kenya's predominantly rural population is reflected in its 65.6% rural and 34.4% urban households. This distribution ensures rural-urban resilience pattern analysis takes into account both geographic contexts. Kenya leads the world in mobile technology adoption with 80.4% mobile phone ownership. The importance of mobile phones in accessing financial services like M-Pesa makes this high adoption rate crucial. With 24.0% earning between KSh 10,001-20,000

monthly, income distribution is diverse. Notably, 38.0% of households earn below KSh 10,000 monthly, indicating a large representation of low-income households crucial for understanding resilience challenges in vulnerable populations. In their prime working years, 54.8% of household heads are 25–44. At 28.3%, 35-44 years is Kenya's largest age group, reflecting its young population while providing enough variation for analysis.

4.2 Household Resilience Index Construction and Analysis

This section provides detailed analysis of the household resilience index construction methodology and examines how resilience varies across key demographic and socioeconomic characteristics to understand factors influencing household capacity to withstand economic shocks.

4.2.1 Resilience Index Construction Methodology

The household resilience index was constructed following established resilience measurement frameworks in development economics. The index combines three key components reflecting different dimensions of household resilience capacity.

Table 3: Resilience Index Components and Weights

Component	Description	Weight	Measurement
Income Stability	Consistency and reliability of household income sources	40%	Measured through income source diversification, employment stability, and seasonal income variation from FinAccess survey questions on income regularity and number of income sources
Savings Capacity	Ability to accumulate and maintain emergency savings	30%	Captured through formal savings in banks and informal savings through groups (chamas), measured using FinAccess questions on savings account ownership and savings amounts
Credit Access	Availability of credit during emergencies	30%	Measured through access to formal credit from banks, informal credit from social networks, and mobile money lending services based on FinAccess credit access and borrowing questions

The formula for the resilience index is:

Resilience Index = (Income Stability × 0.4) + (Savings Capacity × 0.3) + (Credit Access × 0.3)

Income stability the foundation of household economic security is weighted 40% highest. Stable, predictable income streams help households plan for and recover from economic shocks. Income source diversification, employment stability, and seasonal income variation are measured here. Savings capacity is weighted 30% and measures households' emergency funds. This component includes bank and informal savings through groups (chamas) or other mechanisms. Higher savings capacity means better shock absorption. Credit access is weighted 30% and measures households' ability to get emergency credit during economic shocks. Banks, social networks, and mobile money lenders offer formal and informal credit. Credit reliability helps households maintain consumption during income disruptions. Before weighting, each component was standardized to a 0-1 scale for comparability across measurement scales. Higher values indicate greater household resilience to economic shocks. The index ranges from 0 to 4.600. The weighting scheme was based on development economics literature, with income stability being the most important because it affects shock absorption.

4.2.2 Resilience Index Distribution and Variation

The resilience index distribution reveals moderate household resilience capacity with substantial heterogeneity across the sample. The mean resilience score of 1.424 with standard deviation of 1.079 indicates that the average Kenyan household operates significantly below optimal resilience capacity. The median score of 1.300 being lower than the mean, combined with positive skewness of 0.89, indicates that most households cluster toward the lower end of the resilience scale, with a smaller number of households achieving high resilience scores. The resilience index ranges from a minimum of 0.000, representing complete absence of resilience mechanisms, to a maximum of 4.600, indicating very high resilience capacity. The kurtosis value of 3.47 suggests a slightly platykurtic distribution, indicating fewer extreme values than would be expected in a normal distribution.

Table 4: Household Resilience Index by Demographic Characteristics

Characteristic	Category	N	Mean	Std. Dev	Min	Max	t-statistic
Overall		22,024	1.424	1.079	0.000	4.600	
Gender	Male-headed	12,998	1.389	1.063	0.000	4.600	-5.33
	Female-headed	9,026	1.471	1.098	0.000	4.500	
Location	Rural	14,456	1.356	1.045	0.000	4.600	-14.03
	Urban	7,568	1.543	1.126	0.000	4.500	

Female-headed households demonstrate significantly higher resilience compared to male-headed households, with mean scores of 1.471 versus 1.389 respectively. This statistically significant difference suggests that women may employ more effective financial management strategies and maintain stronger social support networks that enhance resilience capacity. Urban households exhibit significantly higher resilience than rural households, with mean scores of 1.543 versus 1.356 respectively. This substantial difference reflects urban advantages in terms of diversified economic opportunities, better infrastructure, and enhanced access to quality financial services.

4.3 Regression Analysis

To assess the effect of financial inclusion on household resilience, we used a joint model that controls for key household characteristics and evaluates the combined effects of access, usage, and product quality. This method lets us determine which financial inclusion dimensions remain statistically significant after accounting for overlaps. To account for the bounded household resilience index, normalized to a 0–1 scale, Fractional Regression Modeling (FRM) was the main estimation method. Robustness checks used OLS regression with robust standard errors. In both models, the household resilience index was the dependent variable and the independent variables were access to financial services (binary variable indicating formal account ownership), active usage, and financial product quality. Control variables included household head age, gender, education, income, urban/rural location, and mobile phone ownership.

Table 5: Joint Regression Results

Variable	FRM Coefficient (standard error)	P-value	OLS Coefficient (standard error)	P-value
Financial Access	0.039 (0.028)	0.164	0.014 (0.010)	0.162
Financial Usage	0.274 (0.023)	0.000	0.098 (0.008)	0.000
Financial Product Quality	0.515 (0.026)	0.000	0.184 (0.009)	0.000
Age of Household Head	-0.006 (0.003)	0.050	-0.002 (0.001)	0.052
Gender (Female = 1)	0.171 (0.045)	0.000	0.061 (0.016)	0.000
Education Level	0.132 (0.031)	0.000	0.047 (0.011)	0.000
Household Income	0.333 (0.020)	0.000	0.119 (0.007)	0.000
Location (Urban = 1)	0.163 (0.053)	0.002	0.058 (0.019)	0.002
Mobile Phone Ownership	0.454 (0.062)	0.000	0.162 (0.022)	0.000

Model Fit Statistics:

Pseudo R-squared (FRM): 0.318

R-squared (OLS): 0.381

Adjusted R-squared (OLS): 0.380

F-statistic (OLS): 1,520.8 ($p < 0.05$)

Log-likelihood (FRM): -8,491.3

Number of Observations: 22,024

The findings from both the FRM and OLS models reveal important insights into the impact of financial inclusion on household resilience. Financial Access: Both the FRM and OLS results show that financial access has no statistically significant effect on household resilience ($\beta = 0.039$, $p = 0.164$ for FRM; $\beta = 0.014$, $p = 0.162$ for OLS). This suggests that mere access to financial services, without active usage, does not significantly improve household resilience. The non-significance of financial access aligns with the argument that accessibility alone does not necessarily enhance resilience, as it may not lead to effective engagement with financial services (World Bank, 2022). Financial Usage: Both models show that financial usage has a statistically significant positive effect on household resilience. The FRM estimate ($\beta = 0.274$) indicates a strong positive relationship, and the OLS estimate ($\beta = 0.098$) also supports this finding. These results confirm that households actively engaging with financial services exhibit higher resilience to shocks, particularly through the use of savings, credit, and insurance services. This is consistent with studies that emphasize the importance of active usage in translating financial inclusion into tangible benefits (Suri, Bharadwaj & Jack, 2021). Financial Product Quality: Financial product quality exhibits the most substantial positive effect on household resilience across both models. The FRM estimate ($\beta = 0.515$) and the OLS estimate ($\beta = 0.184$) show that households with access to reliable, affordable, and suitable financial products are better positioned to manage and recover from economic shocks. This finding underscores the critical role of high-quality financial products in building resilience, supporting arguments that quality considerations are essential for ensuring that financial services contribute effectively to household welfare (Ozili, 2021).

Control Variables: Among the control variables, mobile phone ownership shows the strongest positive effect (β = 0.454 for FRM; β = 0.162 for OLS), reflecting the significant role of mobile money platforms like M-Pesa in enabling financial inclusion and resilience. Household income (β = 0.333 for FRM; β = 0.119 for OLS) also significantly contributes to resilience, as wealthier households have more resources to withstand shocks. Gender (β = 0.171 for FRM; β = 0.061 for OLS), education (β = 0.132 for FRM; β = 0.047 for OLS), and urban location (β = 0.163 for FRM; β = 0.058 for OLS) also show positive and significant relationships with resilience, suggesting that demographic and contextual factors play important roles in determining a household's ability to cope with and recover from shocks. Age of Household Head: The FRM and OLS models both indicate that the age of the household head has a negative effect on resilience (β = -0.006 for FRM; β = -0.002 for OLS). Older household heads, particularly in rural areas or informal employment, are more vulnerable to shocks, as they often have fewer financial buffers.

5.0 Conclusion

This study concludes that financial inclusion enhances household resilience in Kenya through active usage and product quality rather than mere access to financial services. Access alone does not significantly influence resilience, suggesting that infrastructure availability is a necessary but insufficient condition. Active engagement with financial services through savings, credit, and insurance improves households' ability to cope with economic shocks. Financial product quality emerges as the most important factor, indicating that reliable, affordable, and well-designed products are crucial for effective risk management. Mobile phone ownership, female-headed households, urban location, and household income show strong associations with resilience, reflecting the importance of demographic and contextual characteristics. The study concludes that policy interventions should prioritize promoting active usage and improving product quality rather than expanding access infrastructure. Targeted support for vulnerable groups including older-headed households, rural populations, and lower-income households is essential to enhance their resilience capacity.

6.0 Recommendations

Based on the research findings, policymakers should shift emphasis from expanding financial access infrastructure to promoting active usage and ensuring service quality. The Central Bank of Kenya and Financial Sector Deepening Kenya should develop strategies that incentivize engagement through financial literacy programs, simplified products, and removal of hidden costs. Regulatory frameworks must prioritize product quality and consumer protection by strengthening enforcement of Digital Credit Provider Regulations and expanding consumer protection beyond digital lending. Financial institutions should develop shock-absorption products including flexible emergency credit, drought-indexed savings, and affordable microinsurance. Financial literacy initiatives should target rural populations and lower-education households through programs covering budgeting, emergency savings, and strategic credit use. Gender-responsive strategies should leverage the higher resilience of female-headed households through women-focused savings groups and flexible credit facilities. Addressing rural-urban disparities requires investment in rural financial infrastructure, agent banking networks, and agricultural-specific products.

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