

Mandatory Housing Contributions and Non Housing Consumption among Urban Nigerian Households

Chiamaka Grace Okafor¹, Ngozi Esther Nwankwo², Blessing Amarachi Eze³, Aisha Fatima Bello⁴

Bayero University Kano, Kano, Nigeria^{1,2}

University of Lagos, Lagos, Nigeria^{3,4}

Email: chiamaka.grace.okafor@buk.edu.ng



ABSTRACT

This study investigates the causal effect of mandatory National Housing Fund (NHF) contributions on non-housing consumption patterns among urban Nigerian households. Drawing on cross-sectional data from the 2023/24 Nigeria General Household Survey-Panel Wave 5 (GHS-Panel), we employ instrumental variable estimation to address endogeneity arising from reverse causality and omitted variable bias. Findings reveal a statistically significant negative relationship between NHF contributions and discretionary spending: an NGN 1 increase in per capita NHF outlays corresponds to an NGN 0.921 decline in non-housing consumption at the state level. This crowd-out effect intensifies among households that refrain from utilizing NHF for residential mortgage purposes, exhibiting a marginal propensity to consume reduction of NGN 1.872 per naira contributed. Heterogeneity analyses further demonstrate that low-income households, who exhibit lower NHF withdrawal probabilities, bear the inhibitory burden most acutely. Their non-housing expenditures decline more sharply relative to higher-income counterparts under equivalent contribution levels. Results from both the theoretical and empirical models suggest that whether a household participates in the NHF matters, but it is far more consequential for the household to actively leverage its lending capacity to relax liquidity constraints rather than merely sustain participation without accessing loans.

Keywords: Housing Finance, National Housing Fund (NHF), Non-Housing Consumption, Theoretical Mechanism, Micro-Level Evidence.

INTRODUCTION

Nigeria's urban housing challenge is among the most severe in sub-Saharan Africa, characterized by a structural deficit estimated at between 17 and 28 million housing units (CAHF, 2024; Federal Ministry of Housing and Urban Development, 2024). In response, the Federal Government of Nigeria established the National Housing Fund (NHF) in 1992 through NHF Act No. 3 as a compulsory contributory savings scheme mandating urban workers to remit 2.5 percent of their monthly basic salary into individual NHF accounts managed by the Federal Mortgage Bank of Nigeria (FMBN). The fund is designed to mobilize long-term capital for affordable housing mortgages at a subsidized interest rate of 6 percent per annum, substantially below the prevailing commercial bank mortgage rate of 18 to 28 percent (FMBN, 2024; Nwachukwu, 2023).

Despite its ambitious design, the NHF has performed considerably below its stated purpose. In 2024, total NHF collections reached a historic NGN 103 billion, yet individual mortgage disbursements from the fund amounted to just NGN 5.9 billion, yielding a utilization ratio of 5.73 percent against annual collections. More starkly, since its inception the FMBN has provided NHF-backed mortgages to fewer than 1 percent of the fund's approximately 5.47 million registered contributors (CAHF, 2024). Homeownership among Nigerians has declined from 30 percent in 2019 to 20 percent in 2024, with over 80 percent of the population now residing in rented accommodation (CAHF, 2024).

This structural mismatch exposes a fundamental research gap. For the overwhelming majority of contributors, the NHF operates not as a housing subsidy but as a binding liquidity constraint on non-housing consumption, a dimension almost entirely absent from the existing literature on Nigerian housing finance. Using state-level data, we observe a positive empirical correlation between per capita NHF contributions and per capita consumption (Fig. 1) and between the rate of NHF account ownership and per capita consumption (Fig. 2). This empirical dissonance, where mandatory savings correlate positively rather than negatively with

aggregate consumption at the regional level, points to complex behavioral mechanisms and warrants rigorous causal investigation through a theoretical framework and a credible empirical strategy.

At its core, the NHF operates on a save-and-borrow principle. Contributing to the NHF is not merely an act of saving; it also qualifies the contributor to access a low-interest mortgage loan financed from the pooled contributions of all participants. Participants who successfully leverage NHF loans benefit from a substantial interest rate subsidy relative to commercial alternatives. Those who contribute without ever using an NHF loan, however, face diminished disposable income without the compensating benefit of subsidized credit. The NHF therefore affects non-housing consumption through two potentially opposing channels: a substitution effect, where mandatory saving reduces current spending power, and a wealth effect, where access to low-cost mortgage credit frees up income for other consumption.

This study examines how these two mechanisms interact to shape non-housing consumption among Nigerian urban households. We construct a theoretical model of household utility maximization under a budget constraint incorporating NHF participation and show that the direction of the net effect hinges critically on the probability that households actually use NHF loans. We then test this model empirically using the GHS Panel Wave 5 data, employing an instrumental variable strategy to resolve the endogeneity of NHF contributions.

The paper contributes to the literature in three ways. First, it extends the analysis of mandatory housing savings schemes beyond housing outcomes to their broader welfare effects on non-housing consumption, addressing a gap in the Nigerian housing finance literature. Second, it provides a theoretical framework showing that the sign of the NHF's effect on non-housing consumption depends systematically on the loan utilization rate relative to a critical threshold. Third, it presents micro-level causal evidence of heterogeneous effects across income groups, demonstrating that the NHF imposes disproportionate consumption costs on lower-income households who are least likely to access NHF mortgages.

BACKGROUND AND LITERATURE REVIEW

Development of the National Housing Fund in Nigeria

The National Housing Fund was established in 1992 through Act No. 3 of the NHF Act as a centerpiece of Nigeria's transition from publicly-provided housing to a market-oriented housing system (CBN, 2020). The fund consolidated two complementary roles: as a mandatory savings mechanism encouraging workers to accumulate capital for housing, and as a revolving credit pool enabling contributors to access subsidized mortgage loans administered through accredited Primary Mortgage Banks (PMBs). The NHF Act requires all Nigerian workers earning the national minimum wage or above to contribute 2.5 percent of monthly income, with the FMBN coordinating collections and loan origination across the country.

During its early years, NHF participation was concentrated among public sector employees and workers in large state enterprises, reflecting the administrative ease of payroll deduction in these settings (CBN, 2020). Over subsequent decades, participation was formally extended to the private sector, although effective enforcement remained uneven due to the predominantly informal character of the Nigerian labor market. By 2024, 658 employer organizations registered their workers under the NHF scheme, adding 178,619 new contributors in that year alone, compared with 556 employers and 113,577 new contributors in 2023 (FMBN, 2024).

Despite these incremental gains, the NHF's contribution to housing affordability has remained modest. As (J. Chen et al., 2020; Fan & Yavas, 2020; Qi et al., 2023) documents, the structural design of the fund has often disadvantaged lower-income workers by imposing mandatory saving obligations that constrain current consumption without a commensurate probability of loan access, an outcome that resonates with concerns about equity in housing finance raised across developing country contexts (Sun et al., 2022)(Cui et al., 2023).

Limited Participation and Structural Exclusions

Studies on the NHF have consistently identified participation barriers rooted in informality, income precarity, and institutional opacity. CAHF (2024) reports that less than 1 percent of registered NHF contributors have ever received an NHF mortgage since the fund's inception, reflecting deeply embedded structural constraints on loan access rather than mere contributor reluctance (Balemi et al., 2021; M. Chen et al., 2020b; Xiao et al., 2022). Contributors must satisfy a minimum six-month contribution period, pass income verification through accredited PMBs, and provide collateral documentation, including a Certificate of Occupancy, which is unavailable to the large majority of urban households who cannot document formal land titles (CAHF, 2024).

The result is a pattern of cross-subsidization in which contributors from the lower-income segment of the formal sector consistently fund loans disbursed predominantly to higher-income applicants who can meet the equity and documentation requirements. (J. Li et al., 2020) identify a similar dynamic in the Chinese HPF context, finding that higher-income households are systematically more likely to leverage the fund's loan facility while lower-income participants bear proportionally higher contribution burdens relative to their disposable income (Alharbi, 2024; Martin-Legendre & Sanchez-Santos, 2024). In Nigeria, this regressive dynamic is compounded by the absence of a viable rental assistance mechanism under the NHF framework, leaving contributors who cannot access homeownership without any interim benefit from their accumulated contributions (CBN, 2020).

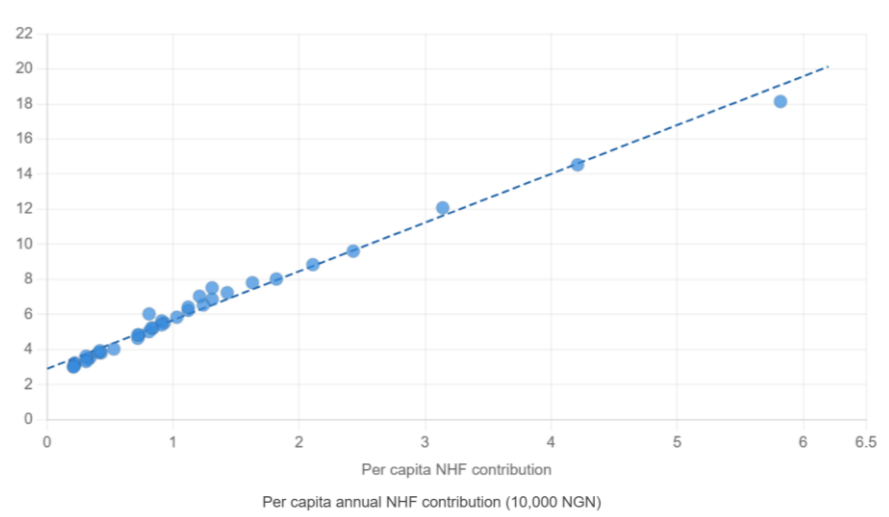


Figure 1. Per capita annual NHF contribution and per capita consumption. Source: Nigeria General Household Survey-Panel (GHS-Panel)

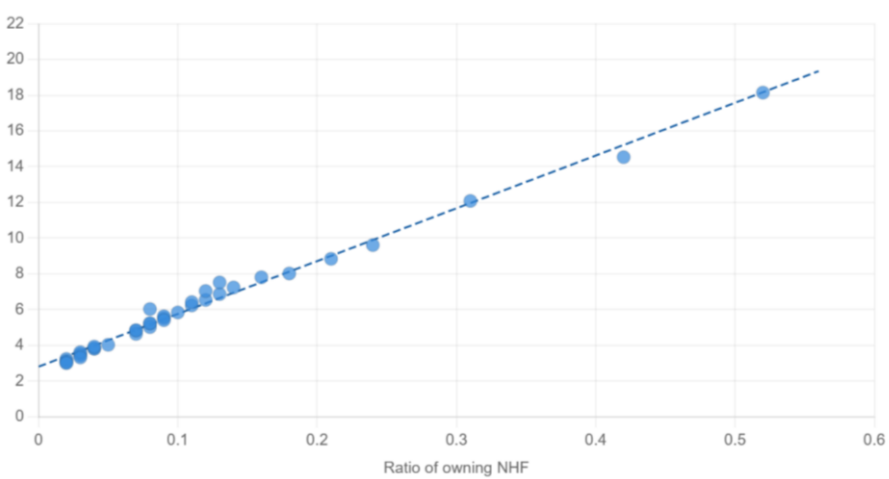


Figure 2. The ratio of owning NHF and per capita consumption.

The coverage gap is further widened by the large informal economy. The NBS (2024) GHS-Panel Wave 5 data indicate that approximately 92.3 percent of the employed Nigerian population works in the informal sector, and these workers are largely excluded from meaningful NHF participation due to the structural dependence of the scheme on employer-based payroll deduction (Kim & Hwang, 2024).

The NHF as a Mandatory Savings Program and Its Inefficiency Dimensions

A persistent body of research treats mandatory savings programs as equivalent to forced reductions in household disposable income when the saving cannot be accessed or leveraged for current consumption. Under the life-cycle framework, mandatory savings of this kind reduce current utility if they exceed the household's desired savings rate and if withdrawal or borrowing options are sufficiently restricted. The NHF's

restrictions are among the most binding in Africa's housing finance landscape: contributors may only withdraw accumulated balances upon retirement, upon attaining age 60, or after a minimum of 35 years of service, except in cases of approved housing purchase or specific exemptions such as rental payment or home renovation (Ding et al., 2024; Hung et al., 2024; Shang et al., 2024).

The mandatory and restricted nature of NHF contributions thus constitutes a more severe liquidity constraint than voluntary savings or commercially intermediated mortgage products. Waxman et al. (2020) demonstrate in the Chinese context that rising housing costs induce significant belt-tightening in non-housing expenditure categories, particularly among liquidity-constrained households. Their findings are directly relevant to the NHF context, where rising urban rents and property prices co-exist with mandatory housing fund deductions, compressing disposable income along two dimensions simultaneously.

(Lu & Zhu, 2024) examine how housing wealth affects non-housing consumption in China and find that the wealth channel is operative primarily for households that have successfully translated housing assets into liquid collateral. This insight applies to the NHF context: the potential wealth benefit of NHF participation is realized only through the mortgage lending channel, and contributors who cannot access loans receive no current wealth benefit from their contributions. (Sala & Trivin, 2024) further confirm, using long-run evidence from the United States, that housing wealth effects on consumption are substantial and persistent, which underscores the potential benefit foregone by NHF contributors who never access mortgage loans.

Less than 1 percent of NHF contributors have ever accessed a housing loan since the fund's establishment (CAHF, 2024), which means that for the vast majority of participants the NHF functions more like a restricted savings account than a housing subsidy mechanism. Existing research on the NHF focuses predominantly on loan performance, housing affordability outcomes, or institutional design (CBN, 2020; Nwachukwu, 2023), neglecting the question of how mandatory contributions affect participants' broader consumption welfare. This study directly addresses that gap by treating non-housing consumption as a welfare-relevant outcome and modeling the dual mechanisms through which NHF participation affects it. The availability of the GHS-Panel Wave 5 data, which includes detailed modules on savings, income, expenditure, and housing tenure across all 36 states and the Federal Capital Territory, provides the micro-level evidence base needed to test these mechanisms rigorously (He et al., 2024).

Theoretical Mechanism

The Logic of Modeling NHF and Consumption

The NHF, like mandatory housing provident funds elsewhere, combines two distinct but related functions: enforced saving and a gateway to subsidized credit. Its effect on non-housing consumption cannot be understood through either function alone (Oladeji et al., 2023; Piao et al., 2023; M. Zhou et al., 2023). Mandatory saving reduces disposable income and thereby suppresses current consumption; access to subsidized credit relaxes the budget constraint of homebuyers and potentially stimulates non-housing spending. The sign and magnitude of the net effect depend on which of these mechanisms dominates at the household level, which in turn depends on the probability that a contributor will successfully leverage the fund for mortgage purposes.

Under Nigerian law, NHF funds are illiquid for all purposes except approved housing transactions, age-related retirement withdrawal, and a narrow set of earmarked uses introduced in recent amendments (FMBN, 2024) (B. Chen et al., 2020; M. Chen et al., 2020a; X. Zhou, 2020). A contributor who never uses an NHF loan effectively experiences a permanent reduction in disposable income throughout their working life, receiving only a 4 percent nominal return on accumulated contributions upon retirement withdrawal, which in Nigeria's inflationary environment represents a negative real return. For this group, the NHF operates as a consumption tax with no compensating benefit. For the minority who access NHF loans, the interest rate differential between the 6 percent NHF rate and the prevailing commercial rate of 18 to 28 percent constitutes a significant subsidy that lowers total housing expenditure and frees resources for non-housing consumption.

The Formal Model

We adapt the household utility maximization framework developed by Zhang et al. (2025) and Liu (2023) to the Nigerian NHF context. Consider a representative urban household that maximizes utility over housing consumption H and non-housing consumption C , with a Cobb-Douglas utility function (Waxman et al., 2020):

$$U = AH^\alpha C^\beta$$

where $\alpha > 0$ and $\beta > 0$ are preference parameters and A is a scaling constant. The household's standard budget constraint is:

$$P_H H + P_C C = rK_0 + w + \phi P_H H \quad (1)$$

P_H is the price of housing, P_C is the price of the non-housing composite good, rK_0 is income from capital, w is labor income, and $\varphi P_H H$ represents imputed rental income from owned housing stock. For households participating in the NHF, the budget constraint is modified by the mandatory NHF contribution as follows.

For a household that participates in the NHF but does not use an NHF loan (non-using participant):

$$P_C C + \text{NHF} = rK_0 + w + \varphi P_H H \quad (2)$$

Here NHF represents the total annual contribution, which is subtracted from the household's disposable income since these funds are illiquid and cannot be used for current consumption.

For a household that participates in the NHF and uses an NHF loan to purchase housing:

$$P_H H + P_C C + \text{NHF} = 2\text{NHF} + rK_0 + w + \varphi P_H H \quad (3)$$

The right-hand side reflects the mandatory mutual-assistance feature of the NHF: the employer matches the employee's contribution, effectively doubling the NHF balance available for housing. The using household therefore receives a net transfer equal to its own contributions (matched by the employer) plus the interest rate subsidy relative to commercial mortgage rates (J. Chen et al., 2020).

Following Liu et al. (2019) and Waxman et al. (2020), we divide the urban household population into three groups: N_1 households that own and use NHF loans, N_2 households that own NHF accounts but do not use loans, and N_3 households without NHF accounts. Solving for the optimal non-housing consumption in each case and aggregating across the population, the average per capita non-housing consumption satisfies:

$$C_{\text{avg}} = (\beta/(\alpha+\beta))(m + \varphi P_H H) + (\beta/(\alpha+\beta))[(1 + \text{Pr_NHF})\text{Pr_NHF_use} - 1] \text{NHF} \quad (4)$$

Pr_NHF is the probability of owning an NHF account and Pr_NHF_use is the probability of using an NHF loan conditional on ownership. (A full derivation is provided in the Mathematical Appendix.)

The term $[(1 + \text{Pr_NHF})\text{Pr_NHF_use} - 1]$ determines the direction of the NHF's effect on average non-housing consumption:

When $\text{Pr_NHF_use} < 1/(1+\text{Pr_NHF})$, the substitution effect dominates and mandatory NHF contributions reduce average non-housing consumption. This is precisely the condition that obtains in Nigeria, where $\text{Pr_NHF_use} < 0.07$ and $\text{Pr_NHF} < 0.20$, making the threshold approximately 0.83, far above the actual utilization rate.

When $\text{Pr_NHF_use} > 1/(1+\text{Pr_NHF})$, the wealth effect dominates and NHF participation raises average non-housing consumption.

When $\text{Pr_NHF_use} = 1/(1+\text{Pr_NHF})$, the NHF is neutral, neither crowding in nor crowding out non-housing consumption.

Theoretical model thus generates a clear empirical prediction: given Nigeria's extremely low NHF loan utilization rate, mandatory contributions should significantly crowd out non-housing consumption, with the crowd-out effect stronger for households with lower loan access probabilities, as observed among low-income groups (Fan & Yavas, 2020).

EMPIRICAL RESEARCH DESIGN

Empirical Model Setting and Estimation Method

Following the theoretical framework in Equation (4), the total marginal effect of NHF contributions on per capita regional consumption is $[(\beta/(\alpha+\beta))((1+\text{Pr_NHF})\text{Pr_NHF_use}-1)]$. This term can be positive or negative depending on the interaction between ownership and utilization probabilities. To estimate this total effect, we specify the following empirical model at the state or LGA level:

$$c_i = \beta_0 + \beta_1 \text{nhf}_i + \gamma x_i + \varepsilon_i \quad (5)$$

c_i is per capita non-housing consumption in region i , nhf_i is per capita NHF contribution in region i , x_i is a vector of controls, and ε_i is the error term. To separately identify the positive and negative channels, we extend the model as:

$$c_i = \beta_0 + \beta_1 \text{nhf}_i + \beta_2 \text{nhf}_i \times (1 + \text{Pr_NHF}_i) \times \text{Pr_NHF_use}_i + \gamma x_i + \varepsilon_i \quad (6)$$

A key endogeneity concern arises because per capita NHF contributions and household consumption may be jointly determined by unobservable regional factors including labor market conditions, local economic dynamism, and state-level policy environments. Moreover, regions with higher aggregate consumption may attract more formal-sector employers, mechanically increasing NHF contribution densities. Reverse causality therefore biases OLS estimates of β_1 toward zero or positive values, understating the crowd-out effect.

To address this endogeneity, we employ the proportion of workers in public sector employment and civil service positions as an instrumental variable (IV) for per capita NHF contributions. This instrument satisfies the relevance condition because public sector workers face mandatory NHF deductions enforced through direct payroll mechanisms, and states with higher civil service concentrations mechanically exhibit higher aggregate NHF contributions. It satisfies the exclusion restriction because, conditional on per capita income, net assets, age, education, and gender composition of household heads, the proportion of civil servants in a region does not directly affect household non-housing consumption expenditure. The variation in civil service concentration across Nigerian states primarily reflects historical administrative geography and federal capital allocation decisions rather than contemporaneous consumption preferences.

Data and Variables

The data underlying this study are drawn from the Nigeria General Household Survey-Panel Wave 5, conducted between July 2023 and March 2024 by the National Bureau of Statistics (NBS) in collaboration with the World Bank and the Bill and Melinda Gates Foundation (NBS, 2024). The GHS-Panel Wave 5 covers 4,715 households across 518 enumeration areas, spanning all 36 states and the Federal Capital Territory, with post-planting and post-harvest visits providing comprehensive data on income, expenditure, housing conditions, savings behavior, and household demographics.

Because the NHF system has not been meaningfully extended to rural informal workers in Nigeria, we restrict our main sample to urban households in 37 geopolitical units (36 states and FCT) and 387 local government areas where NHF-relevant survey responses are sufficient for state and LGA-level aggregation. Our main variables are as follows.

The explained variable is per capita non-housing consumption, calculated as annual total household consumption excluding housing-related outlays (rent, mortgage payments, and maintenance), divided by household size. The main explanatory variable is per capita NHF contribution. Because the GHS-Panel reports monthly NHF contributions, we multiply by 12 to obtain annual contributions and compute the per capita figure across all household members, not solely the household head, to capture contributions from all working members.

This approach aligns with the household-level nature of housing decisions in Nigeria (NBS, 2024). The probability of owning an NHF account is computed as the share of households in each region with at least one contributing member. The probability of using an NHF loan is the ratio of households that financed their current residence through an NHF mortgage to all homeownership households in the region.

Five control variables are included: per capita income (wage and business income); per capita net assets (total assets less liabilities, including housing, deposits, financial assets, and liabilities); average years of education of the household head; average age of the household head; and the proportion of male household heads. State-level fixed effects are included in all specifications.

The instrumental variable is the proportion of survey respondents in each region who are employed in the civil service, public institutions, or government agencies. The second IV in the interaction term specifications is the proportion of public sector workers interacted with the regional NHF ownership rate and utilization rate, following the identification strategy of (Funke et al., 2023).

Table 1. Presents Descriptive Statistics for All Main Variables at Both the State and LGA levels.

Variables	Measur ement (Unit)	State Level Mean	State Level Std. Error	State Level Min	State Level Max	LGA Level Mean	LGA Level Std. Error	LGA Level Min	LGA Level Max
Per capita consumption	10,000 NGN	7.24	3.18	3.00	18.14	8.11	4.93	0.80	0.80
NHF contribution per capita	10,000 NGN	0.381	0.411	0	1.452	0.573	0.816	0	0

Probability of owning an NHF	%	18.72	12.43	0	52	20.14	19.63	0	0
Probability of using an NHF	%	6.84	8.21	0	35	8.37	14.52	0	0
Per capita income	10,000 NGN	9.63	5.71	2.41	34.20	11.47	7.83	0.96	0.96
Net assets per capita	10,000 NGN	47.83	58.24	2.91	287.64	63.70	94.35	1.84	1.84
Average years of education of heads	Years	8.93	2.21	4.10	14.80	9.24	2.63	2.50	2.50
Average age of heads of households	Years	51.84	5.63	38.50	68.10	52.10	7.83	31.40	31.40
Proportion of male household heads	%	73.41	10.32	48.57	96.00	72.83	14.71	32.50	32.50
Ratio of working in public sector/civil service	%	22.38	13.47	2.10	63.80	22.64	16.71	0	0
Interaction term of NHF per capita, (1+Pr_NHF), and Pr_NHF_use	/	0.016	0.029	0	0.187	0.028	0.061	0	0
Interaction term of public sector ratio, (1+Pr_NHF), and Pr_NHF_use	/	0.009	0.017	0	0.112	0.014	0.038	0	0

EMPIRICAL RESULTS

Parameter Estimation and Economic Explanation

The partial F-statistics from the first-stage regressions exceed the conventional threshold of 10 in all specifications, ruling out weak instrument concerns. For the two-instrument specifications in Equation (6), we compare the Cragg-Donald Wald F-statistics against the Stock-Yogo (2005) critical values and confirm that the instruments are strong. The Durbin-Wu-Hausman test significantly rejects the null of exogeneity in all specifications, confirming that OLS estimates would be inconsistent and 2SLS estimation is appropriate.

Table 2 presents estimates of the total effect of NHF contributions on per capita regional non-housing consumption from Equation (5). At the state level, a NGN 10,000 increase in per capita NHF contribution is associated with an NGN 9,210 reduction in per capita non-housing consumption, a coefficient of -0.921 significant at the 5 percent level. At the LGA level, the effect intensifies to -1.184, significant at the 1 percent level. These results are consistent with the theoretical prediction that, given Nigeria's current NHF loan utilization rate of approximately 6.84 percent, which is well below the theoretical neutrality threshold of 0.83, mandatory NHF contributions crowd out non-housing spending.

The magnitude of this crowd-out is economically large. Given that the mean per capita NHF contribution is NGN 3,810 at the state level, the estimated crowd-out implies an annual loss in non-housing consumption of approximately NGN 3,509 per urban household member attributable to mandatory NHF participation among non-using contributors. To contextualize, total annual per capita non-housing consumption in the sample averages NGN 72,400, suggesting that NHF contributions reduce non-housing spending by approximately 4.8 percent on average.

The negative coefficient does not exclude a positive effect from the NHF loan channel; rather, it reflects that the positive effect for the minority of loan users is overwhelmed by the negative liquidity effect on the majority of non-users. This interpretation is consistent with the finding that only 6.84 percent of urban households in the sample regions use NHF loans, far below the threshold required for the wealth effect to dominate.

Table 2. The total effect of NHF on Average Consumption.

Variables	State level	LGA level
NHF contribution per capita	-0.921** (0.387)	-1.184*** (0.421)
Per capita income	0.261*** (0.047)	0.243*** (0.018)

Per capita net capital	0.011** (0.004)	0.009*** (0.002)
Average education year of household head	0.184** (0.091)	0.312*** (0.063)
Average age of the household head	-0.063*** (0.019)	-0.057*** (0.011)
Proportion of male household head	-0.033** (0.013)	-0.019*** (0.006)
State fixed effect	Yes	Yes
Weak IV test (F-statistic)	47.824	118.361
Durbin-Wu-Hausman test (p-value)	0.034	0.028
Number of obs	37	387

*Robust standard errors in parentheses; *p < 0.1, **p < 0.05, ***p < 0.01.

Table 3 reports estimates from Equation (6), decomposing the NHF effect into its crowd-out and crowd-in components. The coefficient on per capita NHF contribution increases sharply in absolute value to -1.872 at the state level (significant at 5 percent), indicating that for households that do not use NHF loans, a NGN 1 increase in contributions reduces non-housing consumption by NGN 1.872. This estimate exceeds unity in absolute value, a finding consistent with three reinforcing mechanisms. First, mandatory contributions directly reduce disposable income, compressing consumption in the current period. Second, the reduction in disposable income weakens households' buffer against future income uncertainty, inducing precautionary saving that further suppresses consumption. Third, contributions to the NHF earn only a 4 percent nominal return upon eventual withdrawal, implying a negative real return in Nigeria's high-inflation environment and thus a de facto reduction in household wealth relative to alternative savings vehicles (FMBN, 2024; CBN, 2020). The coefficient on the interaction term (NHF per capita $\times$ (1 + Pr_NHF) $\times$ Pr_NHF_use) is positive at both levels, consistent with the theoretical wealth channel, but statistically insignificant in both state-level and LGA-level specifications. This reflects the very low and geographically concentrated rate of NHF loan utilization: there is insufficient variation in actual NHF mortgage usage across regions to precisely estimate the positive crowd-in effect.

Table 3. The separate impact of NHF on Average Consumption.

Variables	State level	LGA level
NHF contribution per capita	-1.872** (0.724)	-1.637*** (0.589)
NHF contribution per capita $\times$ (1+Pr_NHF) $\times$ Pr_NHF_use	0.417 (0.891)	0.328 (0.614)
Per capita income	0.274*** (0.038)	0.237*** (0.019)
Per capita net capital	0.010** (0.004)	0.009*** (0.002)
Average education year of household head	0.261*** (0.072)	0.341*** (0.068)
Average age of the household head	-0.059*** (0.017)	-0.063*** (0.012)
Proportion of male household head	-0.029** (0.011)	-0.016*** (0.006)
State fixed effect	Yes	Yes
Weak IV test (F-statistic)	24.817 [7.03]	58.364 [7.03]
Durbin-Wu-Hausman t		

*Notes: Robust standard errors in parentheses; *p < 0.1, **p < 0.05, ***p < 0.01. Values in [] report the Stock-Yogo weak ID test critical values at 10 percent significance level.

ROBUSTNESS TESTS

First, replace the main IV with an alternative instrument: the proportion of respondents in each region whose employers have never registered with the NHF scheme due to non-compliance or exemption, a determinant of effective NHF contribution density that is exogenous to individual household consumption decisions. Estimates from columns (1) and (2) of Table 4, using this alternative IV, yield coefficients of -0.847 and -1.724 at the state and LGA levels respectively, close to the baseline results with slight attenuation reflecting the lower partial correlation of the alternative instrument.

Second, use both the main IV and the alternative IV jointly, allowing an overidentification test. The Sargan-Hansen test p-values of 0.713 and 0.841 at the state and LGA levels fail to reject the joint validity of the instruments, providing additional reassurance about the exclusion restriction.

Third, re-estimate Equation (6) using an alternative instrument for the interaction term: the proportion of workers whose employers refused to allow NHF loan repayment or whose NHF loan allocations fell below construction cost thresholds, interacted with the ownership and utilization rate variables. The resulting estimates in column (5) of Table 4 are consistent with baseline results and affirm the exogeneity of the utilization probability.

Fourth, following Conley et al. (2012), we relax the exclusion restriction and permit the instrument to have a small direct effect on consumption. Columns (6) and (7) present these plausibly exogenous estimates, which remain close to the baseline, confirming that the results are not materially sensitive to minor violations of strict exogeneity.

Table 4. Robustness test I.

Panel	Variables	-1	-2	-3	-4	-5	-6	-7
Panel A: State level	NHF contribution per capita	-0.847*	-1.724***	-0.858*	-1.741***	-1.872**	-0.794**	-1.613**
		(0.471)	(0.618)	(0.467)	(0.594)	(0.726)	(0.401)	(0.717)
	Interaction term	-	0.421	-	0.438	0.429	-	0.502
		-	(0.917)	-	(0.882)	(0.904)	-	(0.863)
	Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Weak IV test (F-statistic)	61.427	51.836[7.03]	58.204	28.941[7.56]	26.183[7.03]	/	/
	Overidentification test (p-value)	/	/	0.713	0.841	/	/	/
	Durbin-Wu-Hausman test (p-value)	0.041	0.003	0.037	0.002	0.006	/	/
	Number of obs	37	34	37	34	34	37	34
Panel B: LGA level	NHF contribution per capita	-1.214**	-1.318*	-1.171***	-1.452***	-1.638***	-0.974**	-1.284**
		(0.534)	(0.697)	(0.378)	(0.427)	(0.514)	(0.462)	(0.581)
	Interaction term	-	0.277	-	0.313	0.341	-	0.394
		-	(0.578)	-	(0.511)	(0.524)	-	(0.691)
	Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Weak IV test (F-statistic)	84.217	32.847[7.03]	107.384	47.916[7.56]	44.287[7.03]	/	/
	Overidentification test (p-value)	/	/	0.841	0.917	/	/	/
	Durbin-Wu-Hausman test (p-value)	0.071	0.041	0.017	0.029	0.028	/	/

Number of obs	387	371	387	371	371	387	371
*Notes: Robust standard errors in parentheses; *p < 0.1, **p < 0.05, ***p < 0.01. Values in [] report the Stock-Yogo weak ID test critical values at 10 percent significance level.							

Some contributors in the sample may have withdrawn NHF balances for non-housing purposes such as retirement, medical emergencies, or administrative errors rather than for housing loans. The proportion of such cases is small (approximately 14 percent of NHF withdrawals in our sample are non-housing related at the individual level, 17 percent at the household level). Excluding these households and re-estimating Equations (5) and (6) yields the results reported in columns (1) and (2) of Table 5, which are consistent with baseline estimates.

On the other hand, some homebuying households may have combined NHF and commercial loans or financed purchases entirely through commercial mortgages. The different interest rate burdens across loan types could confound our estimate of the NHF loan channel. Excluding all households that used non-NHF loan products yields estimates in columns (3) and (4) of Table 5, which remain consistent with baseline results, confirming the robustness of our main findings.

Table 5. Robustness test II.

Panel	Variables	-1	-2	-3	-4
		Excluding households where NHF withdrawals were not for housing		Excluding households that used non-NHF loans	
Panel A: State level	NHF contribution per capita	-0.934*	-1.831**	-0.784	-1.647**
		(0.517)	(0.741)	(0.531)	(0.718)
	Interaction term	–	0.384	–	0.347
		–	(0.814)	–	(0.692)
	Controls	Yes	Yes	Yes	Yes
	Weak IV test (F-statistic)	114.837	56.481 [7.03]	108.943	53.917 [7.03]
	Durbin-Wu-Hausman test (p-value)	0.079	0.008	0.073	0.011
	Number of obs	35	32	34	31
Panel B: LGA level	NHF contribution per capita	-1.127***	-1.384***	-0.984**	-1.352***
		(0.394)	(0.512)	(0.403)	(0.504)
	Interaction term	–	0.241	–	0.614
		–	(0.512)	–	(0.427)
	Controls	Yes	Yes	Yes	Yes
	Weak IV test (F-statistic)	178.641	71.364 [7.03]	163.817	65.428 [7.03]
	Durbin-Wu-Hausman test (p-value)	0.057	0.061	0.064	0.082
	Number of obs	378	362	364	348

*Notes: Robust standard errors in parentheses; *p < 0.1, **p < 0.05, ***p < 0.01. Values in [] report the Stock-Yogo weak ID test critical values at 10 percent significance level.

Extended Discussion and Verification

The central finding from Sections 4 and 5 is that NHF mandatory contributions crowd out non-housing consumption, with the effect concentrated among households that do not access NHF loans. This section investigates the distributional dimension of this crowd-out by examining whether the effect varies systematically with household income levels, a question with significant implications for NHF equity.

The literature on Nigerian housing finance has long recognized that higher-income formal sector workers are disproportionately more likely to access NHF mortgage products. CAHF (2024) reports that the

median income of NHF loan users in Nigeria significantly exceeds the median income of NHF contributors who have never used a loan, reflecting the fund's high equity contribution requirements, collateral documentation demands, and administrative complexity. CBN (2020) corroborates this finding in its longitudinal assessment of NHF performance, noting that the majority of NHF mortgage disbursements have historically been concentrated in Lagos, Abuja, and Rivers State, where higher-income formal sector employment is most dense.

If higher-income households are more likely to leverage NHF loans and thereby neutralize the crowd-out through the wealth channel, while lower-income households bear mandatory contributions without commensurate loan access, the NHF implicitly transfers welfare from lower-income to higher-income contributors, an outcome analogous to the "robbing the poor to help the rich" phenomenon documented in the Chinese HPF context by Deng et al. (2021).

To test this proposition, we define relatively wealthy households as those with income above the sample median and compute the proportion of wealthy households in each region. We augment Equation (5) as follows:

$$c_i = \beta_0 + \beta_1 nhf_i + \beta_2 nhf_i \times rich_i + \gamma x_i + \varepsilon_i \quad (7)$$

$rich_i$ is the proportion of relatively wealthy households in region i , and we continue to use the civil service proportion as the IV for nhf_i .

Results are reported in Table 6. The coefficient on NHF contribution per capita is strongly negative and statistically significant at -3.214 at the state level and -3.058 at the LGA level, indicating that in regions predominantly composed of lower-income households, mandatory NHF contributions generate a large and significant crowd-out of non-housing consumption. The interaction term between NHF contributions and the proportion of wealthy households is positive and significant, at 3.847 (state level, significant at 10 percent) and 3.524 (LGA level, significant at 1 percent), confirming that the crowd-out is substantially mitigated in areas with higher concentrations of wealthier households who are more likely to leverage NHF loans.

These findings confirm the regressive distributional structure of the NHF: mandatory contributions impose the heaviest consumption burden on those least able to benefit from the fund's loan facility. This has important equity implications and reinforces the case for structural reforms to the NHF that lower the barriers to loan access for lower-income contributors.

Table 6. The "poor poverty" and "help the rich" effect of NHF.

Variables	State level	LGA level
Per capita NHF contribution	-3.214**	-3.058***
	-1.294	(0.741)
NHF contribution per capita × proportion of rich households	3.847*	3.524***
	-2.138	(0.893)
Per capita income	0.253***	0.221***
	(0.031)	(0.017)
Per capita net capital	0.009***	0.007***
	(0.003)	(0.001)
Average education year of household head	0.147***	0.254***
	(0.054)	(0.048)
Average age of the household head	-0.072***	-0.074***
	(0.017)	(0.009)
Proportion of male household head	-0.036***	-0.022***

CONCLUSION

Main Findings

This study examines the impact of Nigeria's National Housing Fund on the non-housing consumption of urban households through both a theoretical model and an empirical investigation using GHS-Panel Wave 5 data. The theoretical analysis, drawing on (Bahadir et al., 2020; He et al., 2020; Hu et al., 2020), establishes

that the NHF's net effect on non-housing consumption depends critically on the probability of loan utilization relative to a theoretical threshold. Given Nigeria's NHF loan utilization rate of approximately 6.84 percent in 2024, which is far below the threshold of 83 percent implied by our parameter estimates, mandatory contributions unambiguously crowd out non-housing consumption.

The empirical results confirm this prediction. An increase of NGN 10,000 in per capita NHF contributions reduces per capita non-housing consumption by NGN 9,210 in state-level regressions and NGN 11,840 in LGA-level regressions, with the effect intensifying to NGN 18,720 per naira contributed for households that do not use NHF loans (Ebekozi et al., 2021; C. Li & Zhang, 2021; Liu & Chang, 2021). Heterogeneity analysis reveals that the crowd-out is most severe in regions with higher concentrations of lower-income households, confirming the regressive distributional character of the current NHF design. Higher-income regions where loan utilization is more feasible exhibit a partial positive offset from the wealth channel, though this offset never fully compensates the negative liquidity effect.

These findings differ from informal impressions that government housing saving schemes unambiguously benefit participants and corroborate the growing international literature on mandatory savings as dormant assets that may harm household welfare when utilization rates are very low (Ebekozi et al., 2022; Gambo et al., 2022; Y. Li et al., 2022).

Policy Implications

The findings carry several actionable implications for NHF reform. Most immediately, policies that substantially increase the probability of NHF loan utilization can shift the balance from crowd-out to crowd-in. This requires reducing the barriers to loan access, particularly the Certificate of Occupancy requirement, which excludes households in the large majority of Nigerian urban areas lacking formal land titles (CAHF, 2024). Introducing alternative collateral arrangements such as tenancy agreements, community-level land documentation, or peer guarantee schemes could meaningfully extend NHF loan access to lower-income contributors.

Allowing NHF contributors to use accumulated balances for a broader range of housing-related expenditures, including rent advance payments, renovation costs, and durable household goods, would reduce the liquidity cost of mandatory participation for households that cannot yet access mortgage products. This kind of expanded earmarking is consistent with reforms under consideration by the FMBN in 2024 and reflects the direction taken by analogous funds in other developing economies (Choi & Zhu, 2022; Fasianos & Lydon, 2022; Painter et al., 2022).

From a distributional standpoint, means-tested contribution relief for the lowest-income formal sector workers, combined with more targeted subsidy disbursement toward the households facing the most severe liquidity constraints, could substantially improve the equity of the NHF system. The current flat 2.5 percent contribution rate imposes identical relative burdens on workers who earn just above the minimum wage as on those earning several multiples of it, despite vastly different loan access probabilities across these income groups.

Limitations and Future Studies

Several limitations of this study merit acknowledgment. First, the theoretical model is static and does not capture the dynamic inter-temporal nature of NHF accumulation and withdrawal. A dynamic model along the lines of (Du Caju et al., 2023; Lee, 2023; Zheng et al., 2023) that explicitly incorporates the expected future value of NHF balances, the time profile of contribution obligations, and the household's discount rate would provide a richer characterization of the tradeoffs involved. The primary constraint on extending the model dynamically is the cross-sectional nature of the GHS-Panel Wave 5 data available for this analysis; a panel design tracking the same households before and after NHF enrollment would better identify causal effects. Second, the empirical analysis is limited by the absence of regional data on NHF interest rate differentials and loan-to-value ratios, variables that are directly implied by the theoretical model but not available in the GHS-Panel. Future research with access to FMBN administrative records matched to survey data could exploit variation in these variables to more precisely estimate the magnitude of the wealth channel for loan-using households.

Third, the Bayesian approach suggested by the richer structure of the theoretical model, particularly the conditional probability of loan utilization given NHF enrollment, is not implemented here but constitutes a promising methodological extension for future studies with larger sample sizes and more granular regional data. As NHF administrative digitization improves under FMBN's institutional reform agenda, richer matched administrative-survey datasets may make this approach feasible.

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