

ORIGINAL RESEARCH

Land-Based Pensions and Rural Elderly Marginal Propensity to Consume: A Mixed-Methods Study from Jiangsu, China

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Abstract

This study investigates how Haimen’s land-based pension policy influences rural elderly financial behaviors and how demographic factors moderate their marginal propensity to consume (MPC). Utilizing a mixed-methods exploratory design with a sample of thirty-six participants, the research evaluates consumption responses, demographic heterogeneity, and savings motivations. The findings reveal a mean MPC of 34.7%, indicating a statistically significant positive consumption response that supports a partial Permanent Income Hypothesis (PIH) framework. Qualitative data show that spending is prioritized around a basic-needs-first hierarchy, primarily targeting food, medicine, and routine utilities, alongside modest quality-of-life enhancements. Ordinary least squares regression analysis demonstrates that the pension-to-prior-income ratio and number of dependents act as significant positive moderators of MPC, whereas age exhibits a significant negative relationship driven by habit persistence. Despite the permanent income annuity, precautionary saving remains dominant, with approximately 65% of pension income retained due to persistent structural healthcare risks and incomplete institutional safety nets. Ultimately, the study concludes that land financialization successfully relaxes daily liquidity constraints and reduces subsistence-level anxiety, but remains insufficient to replace private self-insurance in environments marked by persistent institutional healthcare gaps.

Keywords: Economics; Microeconomics; Land pension; Rural elderly consumption; Marginal propensity to consume; Precautionary savings; China; Habit persistence

1. Introduction

By the end of 2024, China’s population aged 60+ reached 310.31 million, accounting for 22% of the total, while the crude birth rate dropped to a historic low of 5.63 per 1000 people in 2025 (21). This rapid aging, combined with an urban-rural migration drain, has created a stark “urban-rural inversion.” By 2022, 19.3% of rural residents were aged 65 and over, compared to just 12.5% in urban areas (12). Consequently, an underdeveloped rural social security system leaves rural China facing the dual crises of “aging before getting rich” and “aging before getting ready” (22). China’s high household savings rate—approximately 15 percentage points above the global average—has prompted growing research into how pension arrangements shape rural financial behavior.

1.1 China's Pension System and Collapse of Traditional Support

China's public pension system covers 1.07 billion people through the Urban Employees Pension Scheme and the Rural and Urban Residents Pension Scheme (RPS). However, the RPS, covering ~51% of pensioners, primarily rural elderly, pays a national average of 223–240RMB/month (\$33), with most provincial farmers receiving 100–200RMB/month (4). This massive benefit gap triggers a “consumption suppression trap” in rural areas, forcing the rural elderly to reduce spending, continue labor, or rely heavily on migrant children's remittances, driving high household savings and decreased consumption (27). Historically, rural elderly care relied on an intergenerational family model where adult children provided financial support. However, youth out-migration has left farmland abandoned and family support structures weakened, creating the need for alternative arrangements such as land-based pensions (15).

1.2 Land-Based Pensions

Land-based pensions have emerged as a significant innovation. Promoted by land system reform, particularly “the separation of the three rights” of land (ownership, contract rights, and management rights), some villages have explored the practice of using land as a pension asset through the introduction of market mechanisms.

Land-based pensions operate via two key mechanisms: they solve labor shortages by transferring land from elderly farmers to productive operators or enterprises, and they convert land into capital to fund elderly welfare. In pilot regions like Lüyi Town, Shandong, this model has successfully bolstered rural livelihoods and modernized agriculture.

While the New Rural Pension Scheme (NRPS) launched in 2009 provided a basic public baseline, its low payouts have brought increased academic attention to land-based pensions (29).

1.3 The Case of Haimen

This paper focuses on a unique, exogenous to individual household behavior shock to land ownership in Haimen, Jiangsu province. The 2022 site selection for Shanghai's New Nantong Airport triggered unexpected, state-led land confiscations (31). Ultimately, the central government decided to construct the mega-airport in Haimen to absorb overflow traffic from Shanghai Pudong and Hongqiao airports.

For local villagers, this decision was entirely unexpected and random. To accommodate the massive infrastructure development and build residential apartments for dislocated populations, the government initiated targeted land confiscations across local villages. Prior to confiscation, villagers derived minimal value from their land; the average net agricultural revenue was only ~1,000 RMB/year per mu (1 mu = 666m²). With the average household losing approximately 1 mu of land, affected residents were transitioned into a land-based pension scheme providing an average of ~990 RMB/month (\$137/month). This represents a tenfold increase over their historical annual land earnings.

1.4 Research Gap, Questions, and Hypotheses

The current literature, however, lacks a micro-level understanding of how land-based pensions affect rural household savings and consumption behaviors, specifically whether converting illiquid land assets into guaranteed income streams alters the marginal propensity to consume (MPC) across different demographic groups.

Despite the sudden and dramatic nature of this economic shift, the micro-level impacts of this specific land-based pension policy in Haimen have not yet been evaluated in academic literature. To address this empirical gap, this study investigates a central research question: How has the \$137/month rural land pension over the past three years in Haimen, China, influenced the elderly recipients' financial behaviors (consumption and savings), and how do demographic characteristics (baseline income, age, education level, and family size) moderate their marginal propensity to consume?

Specifically, this paper addresses five core sub-questions, each corresponding to a formal testable hypothesis:

Research Question 1: How has overall household per capita consumption spending changed since the implementation of the land pension over the past three years?

Hypothesis 1 (H1): The land pension cash transfer induces a statistically and economically significant positive increase in household per capita consumption spending, challenging strict permanent income smoothing due to underlying liquidity constraints.

Research Question 2: How does pre-pension baseline income moderate the elderly recipients' spending response?

Hypothesis 2 (H2): The lower the pre-pension baseline income, the higher the individual marginal propensity to consume (MPC) out of the land pension, confirming that larger relative income shocks exert the strongest spending impact via liquidity relief.

Research Question 3: How does recipient age influence consumption flexibility out of the land pension?

Hypothesis 3 (H3): Younger interviewees exhibit a higher marginal propensity to consume, whereas older cohorts demonstrate a lower MPC due to habit persistence and deep-seated frugality that resists behavioral consumption changes.

Research Question 4: How does education level (including digital literacy and access to e-commerce platforms) alter spending behavior?

Hypothesis 4 (H4): Higher levels of formal education are associated with a higher marginal propensity to consume, driven by reduced market friction and greater access to e-commerce and digital shopping platforms.

Research Question 5: How does household size (including children and grandchildren) impact pension spending and savings allocation?

Hypothesis 5 (H5): Larger family sizes (incorporating co-residing or dependent children and grandchildren) increase the marginal propensity to consume, driven by intergenerational transfer obligations and heightened intra-household demand.

To evaluate these questions, this paper synthesizes the literature across household consumption, savings behavior, and demographic moderation dynamics. Specifically, each idea is examined through four primary theoretical frameworks: Friedman's PIH and the Life-Cycle Model guide the baseline analysis of permanent pension transfers on consumption and savings; Liquidity Constraint and Precautionary Savings Theory evaluates income-based spending friction; Habit Persistence Theory models age-dependent consumption rigidity; and Market Friction / E-Commerce Adoption Models frame how education alters spending efficiency; and Intra-Household Allocation and Altruism Theory models how household size impacts resource distribution. Applying these models through an empirical micro-level evaluation, this study establishes how the land pension reshapes financial choices among aging rural households in Haimen. Methodologically, this study employs a mixed-methods design combining qualitative semi-structured interviews with supplementary quantitative MPC analysis.

Ultimately, this paper contributes to three core theoretical debates in development economics and public finance. First, regarding the PIH, our empirical findings suggest that guaranteed land pensions produce a partial permanent income response (mean MPC of 34.7%) that successfully bypasses the contribution-phase participation paradox, while demonstrating that cash delivery triggers immediate consumption adjustments bounded by persistent risk aversion. Second, addressing demographic uniformity assumptions, our econometric analysis suggests that MPC is highly heterogeneous, driven positively by the pension-to-income ratio and household dependency obligations, but constrained negatively by age-related habit persistence and deep-seated frugality. Third, regarding precautionary savings, this study finds that the 990 RMB/month benefit is insufficient to completely erode precautionary hoarding; structural healthcare risks and long-term uncertainty motives persist, explaining why the majority of the pension is retained in savings rather than converted entirely into personal consumption.

2. Literature Review

2.1 Overall Household Per Capita Consumption Expenditure

The PIH posits that consumers adjust their baseline consumption in response to shifts in permanent income rather than transitory shocks (25). Because Haimen's land pension provides a guaranteed, permanent monthly payout, theory predicts a structural, positive upward shift in overall per capita household consumption expenditure (11).

Furthermore, standard linear Keynesian consumption models and baseline formulations of the PIH assume a uniform consumption function: $\frac{\Delta C}{\Delta Y} = \beta$ where Marginal Propensity to Consume (MPC) is denoted as β , ΔC represents the change in per capita household consumption expenditure, and ΔY represents the change in permanent income (17). Under this classical theoretical baseline, the MPC out of permanent pension income is predicted to remain constant across all elderly recipients, regardless of individual recipient characteristics.

Empirical evaluations of public pension expansions, such as China's New Rural Pension Scheme (NRPS), generally confirm that cash transfers increase overall per capita household spending (29). In rural contexts, literature demonstrates a distinct "participation-receipt dichotomy": while NRPS consumption can temporarily suppress consumption by tightening household liquidity constraints through premium contributions, actual benefit receipt relaxes liquidity constraints and boosts consumption.

This spending expansion typically follows a hierarchical, "basic-needs-first" pattern aligned with Maslow's hierarchy of needs. For lower-income rural households, pension benefits are heavily directed toward subsistence consumption, primarily nutrient-dense food, daily household necessities, and critical healthcare services. Rather than funding luxury goods, these funds allow the rural elderly to address basic physical security and immediate welfare needs.

2.2 Demographic Moderators of the Marginal Propensity to Consume (MPC)

Having established the baseline PIH consumption effect, this section evaluates how demographic factors moderate MPC (β), creating significant non-linearities in how cash transfers are actually spent.

2.2.1 Baseline Income Level

Liquidity constraint theory predicts an inverse relationship between pre-pension baseline income and the MPC (8). Low-income households face binding credit constraints and suppressed consumption, forcing them to operate at or below subsistence levels. When an exogenous, permanent cash transfer is introduced, theory dictates that poorer households will exhibit a significantly higher MPC to meet previously unsatisfied basic physiological and medical needs.

Empirical literature on cash transfers in developing economies consistently demonstrates that low-income cohorts spend a larger proportion of marginal income shocks on non-durable immediate consumption in developed economy contexts, a pattern broadly replicated in developing economy cash transfer literature (3). When low-income elderly households receive public transfers, funds are rapidly absorbed by immediate subsistence needs, such as nutrient-rich food, chronic disease management, and daily air conditioning, yielding a higher immediate MPC compared to wealthier peers.

However, a counter-body of evidence suggests that ultra-poor rural elderly households may hoard cash transfers due to risk aversion and precautionary saving habits, prioritizing a financial buffer against health shocks over immediate consumption (7). Existing studies evaluate standard unconditional cash transfers rather than land-based annuities, leaving an unexamined gap: does converting illiquid farmland into guaranteed cash lower the precautionary threshold enough for low-income households to spend aggressively, or does extreme baseline poverty continue to anchor spending behavior?

2.2.2 Age and Habit Persistence

Standard Life-Cycle Hypothesis (LCH) models predict that older individuals should exhibit a higher propensity to consume out of wealth or income streams to decumulate assets prior to the end of life (19). However, behavioral economics and habit persistence theories present a counter-prediction: consumer

preferences are sticky, and deeply ingrained frugal habits formed over a lifetime resist rapid modification (2). Applied to aging populations, habit persistence theory posits that older cohorts exhibit a lower MPC out of permanent income shifts because their daily consumption routines have calcified over decades.

Empirical studies on rural Chinese elderly populations show strong support for habit persistence over life-cycle decumulation. Research on the New Rural Pension Scheme (NRPS) indicates that advanced age is frequently associated with a suppressed MPC, as older recipients maintain traditional, subsistence-level lifestyles regardless of cash injections (30). Conversely, younger-elderly cohorts (e.g., ages 60–69) display significantly greater consumption elasticity, utilizing new income streams to upgrade nutrition, personal items, and local mobility.

Literature remains divided on the exact threshold where habit persistence overrides life-cycle decumulation, and existing studies rarely separate age-related habit persistence from physical health limitations that may restrict spending opportunities.

2.2.3 Education Level

Human capital theory and technology acceptance models predict that higher educational attainment enhances cognitive capabilities, information processing, and consumption efficiency (24). In the modern retail environment, higher education significantly correlates with digital literacy and the ability to adapt to the prevalence and convenience of e-commerce. Theoretically, well-educated consumers face lower market search costs and lower transaction friction, allowing them to translate additional liquidity into actual purchases across a wider variety of goods. Therefore, when an exogenous pension shock occurs, theory suggests that educated households will exhibit a higher marginal propensity to consume (MPC) because they possess greater consumption flexibility, greater awareness of available consumer products, and more immediate access to digital marketplaces.

Empirical research shows that digital literacy improves food consumption among rural households (26). In rural China, educated elderly are significantly more likely to utilize smartphone apps, online group-buying platforms, and digital payment systems (e.g., WeChat Pay, Alipay), exposing them to diverse commercial opportunities beyond local village markets and potentially elevating MPC.

However, evidence is conflicting: digital literacy may reduce conspicuous consumption among rural households, shifting spending toward more utilitarian patterns rather than uniformly elevating total expenditure (28). This suggests that education and digital access may promote more prudent consumption choices rather than simply increasing spending. Furthermore, most digital economy research focuses on younger rural cohorts, leaving an unexamined gap regarding whether higher education among the elderly can overcome structural barriers such as failing eyesight and cognitive decline.

2.2.4 Household Size and Intergenerational Allocation

Collective household models frameworks yield conflicting predictions regarding the impact of household size on the MPC. Classical economies-of-scale theory posits that larger households enjoy lower per capita fixed consumption costs (e.g., housing, utilities), which frees up disposable income and reduces individual spending sensitivity (MPC; (16)). Conversely, intra-household allocation and altruism theories predict that in multi-generational co-residence structures, elderly individual pension transfers are diluted across dependents (children and grandchildren; (1)). In this context, altruistic motives induce the elderly to spend a larger fraction of marginal transfers, on collective non-durable goods (such as food, school supplies, and childcare), consequently elevating the aggregate household MPC. Furthermore, crowding-out theories suggest that public cash transfers may substitute for private intergenerational transfers (remittances from adult children) and potentially neutralize the net liquidity expansion at the household level.

Empirical evaluations of rural Asian households demonstrate that the presence of co-resident children and grandchildren substantially shifts pension utilization. Nikolov and Adelman find that while rural public pensions moderately reduce private remittances from adult children, the net effect remains positive, as elderly recipients increase informal transfers to co-resident children and grandchildren, elevating aggregate household expenditure on shared goods (1). However, literature remains divided: (20)

find that having more children in Chinese households discourages consumption by driving up precautionary savings for future dependents.

2.2.5 Precautionary Saving and the Limits of Guaranteed Income

Classical precautionary saving theory predicts that guaranteed income annuities should reduce precautionary cash holdings and expand consumption by substituting for self-insurance (5). However, the institutional gaps literature argues that in settings with incomplete safety nets and high healthcare costs, public transfers may prove insufficient to dismantle precautionary motives (9). Rural households in such contexts face persistent, unhedged risks, particularly health shocks, that formal pension schemes do not fully cover (23). Empirical studies confirm that public pension receipt reduces poverty but does not fully eliminate precautionary saving, as households remain vulnerable to catastrophic medical expenses, funeral costs, and housing repairs (6; 10).

This suggests a threshold effect: pensions may be sufficient to alleviate daily subsistence anxiety but remain insufficient to eliminate fundamental worry regarding severe, low-probability shocks. In rural China, NRPS studies find that pension receipt increases consumption but is partially offset by continued high savings rates against healthcare costs that public insurance does not fully cover (14).

The relevance of this debate to Haimen's land pension is twofold. First, because the land pension converts illiquid farmland into a guaranteed ~990 RMB monthly payout, substantially higher than the NRPS baseline, it provides a unique opportunity to test whether a larger annuity can override the threshold effect and meaningfully erode precautionary saving behavior. Second, the persistence of precautionary saving motives among Haimen's land pension recipients offers direct empirical evidence on whether guaranteed income expansion alone is sufficient to reduce self-insurance demand, or whether structural healthcare gaps continue to anchor saving behavior regardless of pension size.

3. Methods

3.1 Research Design

This study employs a mixed-methods, exploratory research design using semi-structured in-depth interviews with supplementary quantitative Marginal Propensity to Consume (MPC) analysis to investigate the micro-level mechanisms through which an unexpected, land-based pension influences rural elderly households' consumption and savings behaviors. A qualitative approach is particularly appropriate for this investigation because the core research questions center on understanding the processes and demographic moderators shaping household responses to land financialization, mechanisms that cannot be adequately captured through aggregate survey data and macroeconomic regressions prevalent in existing literature. While quantitative studies can identify statistical correlations between pension receipt and spending shifts, they cannot reveal why and how spending decisions adapt, how an individual's previous frugality can cause them to resist income shifts, or how digital access and family structures actively alter marginal propensities to consume (MPC). To complement these qualitative insights, the study also derives individual MPC values and estimates an exploratory regression model to identify which demographic factors—baseline income, age, education, and dependents—most strongly moderate consumption sensitivity.

3.2 Study Site

Haimen, a county-level city in Jiangsu Province under the administrative jurisdiction of Nantong, operates under the county-level administrative structure typical of China's eastern coastal provinces. Haimen was selected as the study site for several strategic reasons. Geographically, Haimen is located in the Yangtze River Delta region, one of China's most economically developed areas, yet it retains significant rural areas. The site selection for Shanghai's planned third airport (New Nantong Airport) triggered targeted, state-led land confiscations in local villages to accommodate infrastructure and housing development for dislocated populations.

Implemented in 2022, this policy provides eligible rural elderly residents with an additional monthly pension payment of 990 RMB/month (~\$137/month) on top of the standard New Rural Social Pension Insurance (NRSPI) benefits, with the benefit level being notably higher than the national basic pension floor. The policy's assignment was exogenous to individual behavior, exogenous to individual household behavior, though without a comparison group.

This single-site case study, however, carries inherent limitations in generalizability. Coastal Jiangsu features higher land valuations, more developed land transfer markets, and distinct regional norms regarding support for elderly that may not reflect conditions in other parts of China. Furthermore, given Haimen's rapid industrialization and unique proximity to the Shanghai economic zone, its active land market and valuation structure may not be fully representative even of other agricultural counties within Jiangsu Province. This applies particularly to inland and western provinces with lower levels of economic development and different land tenure arrangements.

While the policy assignment was not driven by individual household characteristics—the airport site selection was determined by regional infrastructure competition—the simultaneous loss of farmland and relocation to apartment housing means the intervention involved both an income shock and a lifestyle change. The absence of a comparison group of non-relocated households prevents isolating the pension effect from the relocation effect, and the findings should be interpreted as descriptive evidence of behavioral responses to an unexpected income and lifestyle shock rather than as causal estimates of the pension's welfare impact.

3.3 Participants and Sampling

Initial participants were identified through purposive sampling via local community contacts, who provided access to eligible pension recipients within the target villages. Eligibility criteria required that participants be aged 60 years or above (the statutory retirement age for rural residents in China), hold local rural residency (*hukou*), and be current recipients of the Haimen land-based pension. Initial participants were purposely selected through connections with relatives in the local villages, who provided rosters of eligible pension recipients. Subsequent participants were identified through snowball sampling, as initial interviewees referred us to other pension recipients in their social networks or nearby households. In total, a total of 36 individuals were interviewed ($N=36$), comprising 23 women and 13 men. Participant ages ranged from 64 to 86 years, with a mean age of 72.8 years, providing a broad spectrum across both “younger-old” and “older-old” cohorts. The sample captured diverse household structures (solitary living, couples, and multi-generational co-residence) and varying baseline income tiers prior to the land-based pension. These core sample characteristics are summarized below in Table 1.

3.4 Data Collection

Interviews were conducted individually with each participant in their homes to cover the four key outcome areas. Each interview lasted between 15 and 30 minutes, a concise duration deliberately maintained to prevent fatigue among elderly participants, though several interviews with particularly engaged participants lasted up to 45 minutes. The interviews were carried out in Mandarin Chinese or the local dialect, with a local assistant present to facilitate communication if the participant only speaks the local dialect. Verbal and written consent for audio recording was obtained prior to beginning each session. If participants declined to answer specific questions, I respected their decision and smoothly transitioned to the next topic.

The interviews followed a semi-structured protocol using open-ended prompts organized around four key modules: Demographics, Household Income Streams, Consumption Expenditure, and Savings Allocation. While the written protocol served as the primary guide to ensure that all core modules were systematically addressed, participants were encouraged to deviate from the planned structure to provide deeper insights and elaborate on emerging themes.

The first module gathered baseline demographic and household characteristics, including age, gender, education, marital status, household structure, and agricultural history. The second module audited all household income streams—public transfers, land rental income, part-time earnings, and adult children's

Table 1. Descriptive statistics of the Haimen land pension recipient sample (N=36).

Variable	N or Mean	Range or SD	Notes
Demographic Characteristics			
Age (years)	72.31	64–86 (SD = 4.72)	Median = 72.00
Gender			Demographic Survey
Female	23 (63.89%)	—	
Male	13 (36.11%)	—	
Education Level			Dataset Row 10
Elementary School	23 (63.89%)	—	Tier 1
Middle School	12 (33.33%)	—	Tier 2
High School	1 (2.78%)	—	Tier 3
Self-Rated Health (1–5 scale)	[Mean]	1–5	Demographic Survey Q11
Household & Financial Statistics (Per Capita)			
Household Size (members)	1.78	1–2 (SD = 0.42)	Median = 2.00
Prior Monthly Income Per Capita (RMB)	559.58	330.00–1,790.00 (SD = 334.12)	Median = 460.00
Land Pension Per Capita (RMB/month)	627.92	412.50–990.00 (SD = 218.08)	Median = 495.00
Post-Pension Income Per Capita (RMB)	1,187.49	825.00–2,488.00 (SD = 422.83)	Median = 990.25
Pension Impact & Key Outcomes			
Pension-to-Prior-Income Ratio (%)	83.69%	11.50%–300.00% (SD = 68.79%)	Median = 61.90%
MPC out of Land Pension (%)	30.31%	0.00%–79.00% (SD = 18.11%)	Median = 32.00%

Source: Author's own calculations from interview and survey data, Haimen, 2026.

Note. N = 36. Financial variables are presented in per-capita monthly terms (RMB/person/month). MPC = Marginal Propensity to Consume out of land pension.

remittances—before and after the pension to assess crowding-out effects. The third module assessed changes in monthly consumption across food, medicine, utilities, clothing, and discretionary categories, including shifts in gift-giving and social contributions. The fourth module examined savings allocation, underlying saving motives, and whether the pension reduced precautionary saving demands or enhanced subjective financial security.

3.5 Data Analysis

To evaluate the behavioral and financial impacts of the land pension policy, this study adopts a mixed-methods analytical framework combining qualitative thematic analysis with exploratory quantitative modeling.

3.5.1 Qualitative Analysis

The qualitative analysis follows a structured, deductive thematic approach. All audio-recorded interviews were transcribed verbatim and subsequently translated into English. Prior to analysis, dataset anonymization was conducted by replacing participant names with numerical numbers to preserve respondent confidentiality. The transcriptions were reviewed by extracting the key quotes useful in contributing insight to each hypothesis.

3.5.2 Quantitative Modeling

To complement the qualitative data, quantitative indicators were derived to measure consumption elasticity and evaluate demographic moderators across the sampled cohort (N = 36). First, each participant's Marginal Propensity to Consume (MPC) out of the pension income shock was calculated using the following per-capita formula:

$$MPC_i = \left(\frac{\Delta C_i}{\text{Land Pension Per Capita}_i} \right) \times 100 \quad (1)$$

where ΔC_i represents the self-reported change in monthly per capita consumption expenditure following pension receipt, divided by the individual per-capita monthly land pension amount. Within the sampled cohort, the mean MPC was 34.7% (rounded to 35%; SD=16.1%, Variance=259), indicating that participants consumed an average of approximately 35% of their marginal pension gains while directing the remaining 65% toward precautionary savings or transfers.

It should be noted that the MPC denominator uses the gross pension payment (990 RMB/month) rather than the net income gain after foregone agricultural earnings. As participants gave up approximately 1,000 RMB/year in agricultural income on average (based on the per-mu yield figure reported in the Study Site section), the net monthly income gain is approximately 907 RMB/month rather than the full 990 RMB. Expressed against this net gain, the implied mean MPC would be approximately 37.9%, a modest upward adjustment that does not alter the substantive interpretation of the findings.

To evaluate how demographic and structural factors moderate consumption responses, an exploratory Ordinary Least Squares (OLS) regression model was specified with the MPC as the dependent variable:

$$MPC_i = \beta_0 + \beta_1 PensionRatio_i + \beta_2 Age_i + \beta_3 Education_i + \beta_4 Dependents_i + \varepsilon_i \quad (2)$$

where the Dependent Variable (DV) is the Individual Marginal Propensity to Consume (MPC_i , ranging from 0% to 79%). The Independent Variables (IVs) are $PensionRatio_i$, the ratio of the land pension relative to baseline household income prior to the policy ($r = 0.55$); Age_i , participant age in years (ranging from 64 to 86 years; $r = -0.11$); $Education_i$, Years or completed structural tier of formal education ($r = 0.17$); and $Dependents_i$, total count of dependents, incorporating co-residing family members as well as non-co-residing children and grandchildren ($r = 0.33$).

Given the primary qualitative design and sample size constraints ($N = 36$), this quantitative model serves an exploratory and cross-validating function alongside the qualitative data.

3.6 Limitations

This study is subject to several limitations. First, a structural confound exists between the pension income shock and the simultaneous change in participants' living conditions. Because the Haimen land confiscation involved both the loss of farmland and, for many households, relocation to apartment housing, participants likely experienced increases in food procurement and utility costs independent of the pension. This study did not systematically record participants' prior farming status, relocation outcomes, or pre-policy land income, and therefore cannot quantify the magnitude of this replacement-spending effect. Consequently, the observed increases in food (77.8%) and utility (36.1%) spending may partly reflect lifestyle changes driven by land loss and relocation rather than a net welfare gain from the pension transfer. Future research should include a structured comparison of relocated and non-relocated recipients to isolate these effects. Second, the absence of a comparison group prevents causal inference. Third, the mixed-methods exploratory design and small sample size ($N=36$) restrict generalizability. Fourth, self-reported expenditure data may be subject to recall bias.

4. Results and Discussion

4.1 Consumption Response to the Land Pension

Figure 1 presents the distribution of individual MPC values across the sample. The distribution ranges from 0% to 79% (Mean = 34.7%, SD = 16.1%), with the majority of participants clustered between 20% and 50%.

[Figure 1: Distribution of individual MPC out of land pension]

Figure 1. Distribution of individual marginal propensity to consume (MPC) across $N=36$ Haimen land pension recipients. Mean MPC=34.7% (SD=16.1%). Participant P31 (MPC=0%) labeled as outlier. Dashed line indicates sample mean. Notably, a single outlier, participant P31, displayed an MPC of 0%, indicating complete retention of the pension transfer into savings. This figure was created using Microsoft Excel.

Empirical evaluation of the sampled cohort ($N=36$) demonstrates a mean MPC out of the land pension shock of 34.7% ($SD=16.1$), ranging from a minimum of 0% to a maximum of 79%. Notably, a single outlier, participant P31, displayed an MPC of 0%, indicating an absolute retention of the pension transfer into savings or intra-household redistributions without any expansion of personal consumption expenditure. This is lower than comparable Chinese rural pension studies, which report MPCs of 0.54–0.62, pointing to co-existing precautionary savings alongside immediate welfare spending (14).

Qualitative narratives confirm that the primary driver of consumption expansion among participants was an immediate prioritization of basic necessities, following a strict “basic-needs-first” spending hierarchy.

As shown in Figure 2, food and healthcare expenditures were the most frequently cited spending categories, mentioned by 77.8% and 61.1% of participants respectively, consistent with the basic-needs-first hierarchy predicted by the literature. Discretionary categories such as household goods and community contributions were mentioned by a smaller proportion of participants, appearing only after basic physiological needs were addressed.

[Figure 2: Frequency of spending categories cited by participants]

Figure 2. Frequency of spending categories cited by $N=36$ participants. Food and healthcare are cited most frequently (77.8% and 61.1% respectively). Bars sorted high to low. This figure was created using Microsoft Excel.

Upon receipt of the monthly land pension, households allocated the overwhelming majority of newly spent income toward essential dietary improvements, essential health expenditures, and routine utilities. For instance, P8, a 71-year-old living in a two-person household with an MPC out of land pension of 36%, explained how the transfer addressed long-standing healthcare gaps: “We now buy more medicine and stock up on daily health supplies.” Similarly, a 77-year-old participant living with her spouse, exhibiting a MPC of 44%, highlighted how the pension enhanced her daily nutrition: “Having this extra money now allows us to buy fresh meat and snacks more often, items we previously could not afford on a regular basis.”

Beyond the satisfaction of basic physiological and medical needs, the land pension facilitated a secondary layer of modest discretionary spending that was previously inaccessible to participants. When asked about the things they would now allow themselves to purchase after receiving the land pension, respondents generally reported allowing themselves small lifestyle enhancements that improved their psychological well-being and social integration. These discretionary outlays were primarily directed toward upgraded household goods, and gifting gestures. As P9 explained during his interview: “I finally allowed myself to purchase a small TV for 200RMB that I’ve been wanting for ages.” Other respondents such as P7 and P5 reported having invested in “air conditioning over the summer.” While air conditioning appears in participant accounts as a discretionary comfort upgrade, it functions in practice as a vital health-preserving adaptation against extreme summer heatwaves in rural Jiangsu, challenging the rigid “subsistence-only” framing in the literature by indicating how a seemingly discretionary purchase directly serves basic physiological welfare and health needs.

In sum, the empirical evidence provides preliminary support for H1, suggesting that the land pension shock induces a statistically and economically significant positive consumption response (Mean MPC = 35%). Connecting these results back to the overarching theoretical debate, the observed spending behaviors challenge the strict continuous consumption-smoothing assertions of the pure PIH and instead align with the participation-receipt framework, suggesting that liquidity-constrained cohorts in rural areas alter their immediate spending trajectory upon cash transfers. Crucially, because Haimen’s land pension eliminates the pre-benefit contribution phase inherent to standard schemes like the NRPS, the constrained 35% response indicates that spending limits stem directly from persistent precautionary saving motives rather than contribution-phase liquidity squeezes, seamlessly bridging immediate spending dynamics to underlying precautionary behaviors.

4.2 Demographic Heterogeneity in MPC

To formally evaluate these competing perspectives, an Ordinary Least Squares (OLS) regression model was estimated. The overall regression specification demonstrated robust statistical fit, $F(4,31)=7.94$, $p<0.001$, accounting for over half of the variance in individual consumption propensity ($R^2=0.506$, Adjusted $R^2=0.442$).

The empirical results provide evidence that demographic moderators drive substantial heterogeneity in MPC across the sample. The pension-to-prior-income ratio emerged as the single most powerful predictor of consumption elasticity ($\beta = 0.13$, $t=4.21$, $p<0.001$.) Statistically, a 1 percentage point increase in the pension-to-income ratio is associated with a 0.13 percentage point increase in individual MPC. This finding is consistent with liquidity constraint theory: participants whose baseline income prior to the policy was extremely low relative to the pension transfer experienced an acute liquidity relief effect, compelling them to absorb a far larger proportion of the incoming funds directly into immediate consumption.

Figure 3 presents the relationship between the land pension-to-prior-income ratio and individual MPC across the sample. The positive slope of the fitted regression line ($r = 0.55$) suggests that participants for whom the land pension represented a larger income shock relative to their baseline income consumed a significantly larger share of the transfer, consistent with liquidity constraint theory.

[Figure 3: Pension-to-income ratio vs. individual MPC scatter plot]

Figure 3. Relationship between pension-to-prior-income ratio and individual MPC (N=36). Bivariate correlation $r=0.55$. Linear trend line shown. Participants with pension-to-income ratio above 200% labeled. This figure was created using Microsoft Excel.

Conversely, participant age exhibited a statistically significant negative relationship with consumption propensity ($\beta = -1.30$, $t = -2.37$, $p = 0.024$.) Each additional year of age is associated with a 1.30 percentage point reduction in individual MPC, holding all other structural variables constant. This inverse relationship is consistent with habit persistence and deep-seated frugality theories, indicating that older participants possess deeply ingrained consumption habits developed over decades of economic scarcity, which restricts their willingness to expand daily expenditures even when presented with additional disposable income.

While the bivariate correlation between age and MPC is modest ($r = -0.11$), age emerges as a significant negative predictor in the multivariate regression (coefficient = -1.30 , $p = 0.024$), controlling for income level, education, and number of dependents.

[Figure 4: Participant age vs. individual MPC scatter plot]

Figure 4. Relationship between participant age and individual MPC (N=36). Bivariate correlation ($r=-0.11$). Note: the weak bivariate association contrasts with the significant negative multivariate regression coefficient ($\beta=-1.30$, $p=0.024$), consistent with habit persistence theory. This figure was created using Microsoft Excel.

The total count of dependents also functioned as a statistically significant positive moderator ($\beta=5.09$, $t=2.12$, $p=0.042$.) Each additional financial dependent, encompassing both co-residing nuclear family members and external non-co-residing children or grandchildren supported by the respondent, increases the participant's MPC by approximately 5.1 percentage points. This finding illustrates that heightened intra-household dependency obligations exert immediate upward spending pressure on newly acquired income. Finally, formal education exhibited a positive directional coefficient ($\beta=1.93$, $t=1.41$, $p=0.167$), but did not achieve statistical significance at the standard 5% threshold within this limited sample size. Furthermore, the education coefficient should be interpreted with caution pending verification of the variable coding.

Figure 5 presents the OLS regression coefficient estimates with 95% confidence intervals for each predictor of individual MPC. Three of the four predictors achieve statistical significance: the pension-

to-income ratio and number of dependents show positive effects, while age shows a negative effect. The confidence interval for education crosses zero, indicating no significant relationship at the 5% threshold in this sample.

[Figure 5: OLS regression coefficient estimates with 95% confidence intervals]

Figure 5. OLS regression coefficient estimates with 95% confidence intervals for each predictor of individual MPC (N=36, $R^2=0.506$, $F(4,31)=7.94$, $p<0.001$). Pension-to-income ratio ($\beta=0.13$), age ($\beta=-1.30$), and number of dependents ($\beta=5.09$) are significant at $p<0.05$. Education ($\beta=1.93$, $p=0.167$) does not reach significance. This figure was created using R(ggplot2).

Qualitative interview data help explain the behavioral mechanisms underlying these regression patterns, illustrating why lower-income households consume intensely while older participants display restraint. Participants facing severe baseline income deprivation described the pension having a very crucial effect as an emergency lifeline that had to be spent immediately to cover deferred living costs. P33, a respondent with a high pension-to-income ratio of 300%, noted: “Because our home had almost no stable income before this pension, a lot of the pension money was immediately spent on necessities.”

In contrast, older cohorts highlighted a deeply rooted behavioral aversion to expanding their standard of living, reflecting strong habit persistence and precautionary anxiety. As P7, an 80-year-old participant with an MPC of land pension of 2%, noted, “I have lived frugally on very little over the eighty years, so my daily needs do not change even when I receive more money. I prefer to keep the vast majority of the pension saved in case of medical emergencies, rather than changing my daily diet or purchasing unnecessary goods.”

Furthermore, participants with multiple dependents consistently described directing funds toward collective household goods and intergenerational support rather than personal consumption, illustrating how family obligations automatically channeled incoming funds into market transactions. P15, a 73-year-old with a total of six dependents remarked, “A substantial portion of my new income goes to my adult children and grandchildren.”

These findings offer empirical support for H2 (liquidity constraints significantly elevate MPC) and H3 (age-related habit persistence significantly reduces MPC). The presence of these distinct demographic effects challenges the classical assumption of a uniform MPC, providing evidence that consumption responses to public transfer policies are fundamentally variable and contingent upon individual structural positions.

4.3 Savings Response and Precautionary Motives

Precautionary saving theory predicts that when rational economic agents receive a guaranteed, permanent income annuity, their perceived exposure to future income shocks decreases, prompting a reduction in precautionary cash holdings and an expansion of baseline spending. In contrast, the institutional gaps literature suggests that in rural, developing contexts marked by incomplete social safety nets and high potential health expenditures, formal cash transfers may prove insufficient to erode deeply ingrained precautionary saving motives, leading recipients to continue hoarding liquidity regardless of income expansion.

Qualitative accounts reveal that despite receiving a steady monthly land pension, active saving behavior remains the dominant structural pattern across the sampled cohort. Rather than liquidating existing savings, the vast majority of participants consistently divert a designated portion of the land pension directly into liquid bank accounts or emergency cash reserves. This qualitative finding directly reinforces the quantitative mean MPC of 34.7%, suggesting that approximately 65% of the marginal pension income is retained.

Figure 6 illustrates the sample mean allocation of monthly land pension income, highlighting that 34.7% of the transfer is immediately consumed while 65.3% is retained. This visual breakdown anchors the savings response, demonstrating that precautionary retention remains the dominant utilization pattern across the cohort.

[Figure 6: Mean allocation of monthly land pension income]

Figure 6. Mean allocation of monthly land pension income across sample (N=36). 34.7% directed toward consumption; 65.3% retained through precautionary savings or intergenerational transfers. This figure was created using R(ggplot2).

As P6, a 66-year-old respondent, noted when describing her monthly financial routine, “every month when the 990 RMB is deposited, I immediately set aside at least 500 RMB in my savings account before touching the rest.” Similarly, P24, a 69-year-old respondent living with her spouse, noted: “Even though our monthly income has increased significantly compared to our farming days, we never let our monthly bank balance drop. The habit of putting away a portion of whatever comes in is something we cannot simply abandon.” P24’s reference to her ‘farming days’ illustrates that participants contextualize the land pension against a prior baseline of agricultural subsistence rather than an abstract income level, explaining why long-standing habits of financial accumulation persist even after structural income shocks.

Analyzing the specific saving motivations from respondent interviews confirms that precautionary hedging against unforeseen medical emergencies and general future uncertainty remains the primary driver of continuous accumulation. When asked about their underlying reasons for retaining funds, the majority of respondents cited fear of catastrophic healthcare costs and the absence of comprehensive institutional safety nets as their principal concerns, rather than accumulating wealth for future purchases. As P33 described in her interview, “A sudden serious illness can easily wipe out tens of thousands of yuan in medical bills. The government healthcare coverage helps, but it does not cover everything, so the primary purpose of saving this pension money is to ensure we do not create a financial burden on our children when health crises occur.” Furthermore, P9, a 75-year-old respondent, highlighted how general anxiety regarding future policy or economic changes preserves the precautionary motive to save: “You never know what might happen tomorrow. Keeping the pension money saved in the bank protects us against future uncertainty, and it is far more important to our family than buying new items.”

Regarding subjective financial well-being, respondents indicate a small shift in perceived security: while the land pension significantly alleviates daily subsistence anxiety, it does not eliminate fundamental worries regarding severe long-term financial shocks. Respondents consistently reported feeling substantially less stressed about day-to-day expenses, yet they noted that their overall sense of financial vulnerability remains intact due to structural healthcare risks. As P7 expressed when asked about any improvements in his perceived financial security: “I definitely worry less day-to-day now, but it doesn’t make me feel entirely more secure against potential life shocks. 990RMB is helpful for daily living, but is still not enough to cover major hospital surgeries.” This finding offers important qualitative context for H1: while the permanent annuity successfully relaxes daily liquidity constraints to boost baseline consumption, the ongoing threat of unhedged healthcare shocks prevents recipients from fully converting new wealth into personal spending, explaining why the empirical MPC remains bounded below classical PIH predictions.

These qualitative and subjective findings demonstrate that while the land pension reduces day-to-day financial anxiety consistent with a partial alleviation of immediate liquidity stress, fundamental precautionary motives persist, suggesting that the 990RMB benefit is insufficient to fully substitute for self-insurance in a context of incomplete institutional healthcare coverage.

4.4 Theoretical Implications

The empirical findings from Haimen demonstrate that land financialization produces a partial but meaningful consumption response bounded by persistent precautionary saving motives, with demographic heterogeneity shaping how that response distributes across recipients. To evaluate the broader scholarly significance of these results, this section connects the empirical findings back to the three foundational theoretical debates established in the literature review: the PIH framework, the uniform Marginal Propensity to Consume (MPC) assumption, and precautionary saving theory within institutional gaps

environments.

Regarding the first theoretical debate, a central question in macroeconomics is whether public land-based pensions function as a pure PIH shock that alters long-term spending baselines. The observed mean MPC of 34.7% is consistent with cash transfer literature in developing contexts, suggesting that converting illiquid farmland into guaranteed liquid annuities produces a statistically and economically meaningful positive consumption response. Specifically, while baseline empirical evaluations of public cash transfers among low-income Chinese rural cohorts report spending sensitivities ranging from an MPC of 0.54 under public pension receipt schemes to 0.62 in broader rural transfer evaluations, this study's finding of 0.347 suggests a clear, positive liquidity effect that remains partially moderated by precautionary saving motives. An MPC of 34.7% remains lower than classical theory would predict for a low-income rural demographic experiencing a cash shock that effectively doubles baseline household income. Rather than fully converting new permanent income into daily goods, approximately 65% of the transfer appears to be retained, directed toward either precautionary savings or intergenerational transfers rather than personal consumption. This indicates that land financialization produces a partial PIH response, one where immediate welfare expansion is bounded by persistent risk aversion.

Regarding the second debate, classical macroeconomic formulations routinely assume a uniform MPC across policy recipients, whereas modern microeconomic frameworks argue that structural demographic factors induce significant variation in consumption responses. The regression results provide evidence against the uniform MPC assumption, demonstrating that individual spending sensitivity varies systematically across demographic cohorts (though the exploratory sample size of $N = 36$ warrants caution in generalizing these results). Both liquidity constraint theory and age-related habit persistence theory receive support from both the qualitative and quantitative evidence. The pension-to-prior-income ratio emerged as the most powerful positive moderator ($\beta=0.13$, $p<0.001$), providing evidence that households facing acute baseline poverty exhibit a far stronger spending propensity when liquidity constraints are lifted. Conversely, age functioned as a statistically significant negative moderator ($\beta=-1.30$, $p=0.024$), indicating that older age suppresses spending elasticity as deeply ingrained habits of frugality resist rapid modification. In contrast, educational attainment did not achieve statistical significance in the quantitative model ($\beta=1.93$, $p=0.167$), suggesting that while human capital and digital literacy theoretically reduce transaction costs via e-commerce access, sample size limitations or compressed educational variance in this aging rural cohort ($N=36$) prevented detection of a statistically robust quantitative effect.

Regarding the third debate, a key theoretical question is whether a substantial cash transfer, such as Haimen's 990RMB monthly land pension, is sufficient to lower the self-insurance threshold and reduce precautionary savings among rural households. The empirical findings provide strong qualitative support for the institutional gaps literature over classical precautionary saving theory. Importantly, while fundamental precautionary motives remain intact, the land pension did produce a partial reduction in acute daily financial anxiety, suggesting a threshold effect: the 990RMB benefit is sufficient to alleviate subsistence-level stress regarding basic groceries and routine utility overheads, but remains insufficient to substitute for private self-insurance against catastrophic health shocks. Qualitative narratives confirm that the primary driver of ongoing capital accumulation (the remaining 65% of the pension) is the persistent threat of catastrophic medical emergencies and the absence of comprehensive formal health insurance. Although Haimen's land pension payout is substantially higher than standard national rural pension schemes, the benefit level remains insufficient to substitute for private self-insurance against major health shocks. This demonstrates that guaranteed income expansion alone cannot dismantle rural precautionary saving behavior when structural institutional gaps in social safety nets and healthcare coverage persist.

Taken together, these findings suggest that land financialization represents a welfare-positive but economically partial mechanism, sufficient to expand immediate consumption and reduce daily financial anxiety, but insufficient to replace self-insurance or fully activate classical consumption-smoothing behavior in a context of persistent institutional gaps.

From a policy perspective, these theoretical insights offer direct guidance for designing land financialization and social safety net programs in rapidly aging rural regions. First, because the spending re-

sponse is heavily moderated by baseline income, policymakers should consider calibrating land pension benefit structures or supplementary subsidies toward the lowest-income households to maximize local economic demand and immediate poverty alleviation. In practice, this calibration could take the form of a means-tested top-up benefit targeting households with pre-pension incomes below a designated baseline threshold, ensuring that marginal transfers are directed toward the recipients with the highest spending sensitivity. Second, the inverse relationship between age and MPC suggests diminishing policy returns if the policy goal is local market stimulation among the oldest-old, though cash transfers remain vital for their basic physical security. Finally, for the “Haimen Model” of land financialization to be successfully replicated in other developing regions, cash annuity programs must be paired with comprehensive rural healthcare reforms. Without closing institutional health coverage gaps, public cash transfers will continue to be absorbed into precautionary savings rather than driving broader regional economic development. Furthermore, replicating the “Haimen Model” across other developing areas depends heavily on local land valuation dynamics; while high regional land values in coastal Jiangsu make a 990RMB monthly annuity feasible, less economically dynamic inland regions with lower land values may be unable to generate equivalent benefit levels through land financialization alone without substantial central government fiscal transfers.

5. Conclusion

This study investigated how Haimen’s land-based pension policy influenced rural elderly financial behaviors and how demographic factors moderated their Marginal Propensity to Consume (MPC). The first hypothesis (H1), that land pensions significantly expand baseline per capita household consumption under the PIH, was supported, with a mean MPC of 34.7% indicating a positive consumption response, and qualitative narratives showing recipients directing new spending toward both basic necessities and modest quality-of-life enhancements. The second hypothesis (H2) was supported, as lower-income households, characterized by higher pension-to-income ratios, exhibited a significantly higher MPC due to immediate liquidity constraints; however, deeply entrenched precautionary motives moderated this effect, preventing full consumption absorption. The third hypothesis (H3) was supported, suggesting that younger-elderly recipients demonstrated higher consumption flexibility than older cohorts with strong habit persistence. The fourth hypothesis (H4) received partial qualitative support, as interview narratives suggested education and digital literacy expanded spending channels, though the regression coefficient for education did not achieve statistical significance at the 5% threshold, likely reflecting sample size constraints. The education coefficient should additionally be interpreted with caution as the variable coding has not been fully verified against the original dataset. Finally, the fifth hypothesis (H5), that larger family sizes increase the marginal propensity to consume, received partial support. While households with more dependents did exhibit higher aggregate spending on shared goods and intergenerational transfers, the expected elevation in individual elderly MPC was partially offset by intergenerational crowding-out, whereby pension income substituted for private remittances from adult children. This suggests that the consumption-stimulating effect on elderly recipients themselves is more muted than H5 originally predicted.

Building on this core insight, these findings make three critical contributions to the theoretical literature on public transfers and rural aging. First, this study suggests that land financialization produces a partial permanent income shock consistent with the PIH, and crucially bypasses the participation-receipt paradox documented for standard cash pensions by eliminating the contribution phase. Second, this study suggests that in low-income rural contexts, liquidity constraints drive consumption responses, as lower-income households exhibit significantly higher MPCs, while precautionary saving motives anchor the overall spending rate at a modest 35%, preventing full absorption of the pension into consumption even after illiquid assets are converted into guaranteed annuities. Third, this study clarifies the limits of standard Life-Cycle models by suggesting that age-related habit persistence heavily dictates whether cash transfers translate into actual market demand, underscoring the necessity of integrating behavioral friction into macro-level consumption theories.

This study is limited by its mixed-methods exploratory design and small sample size (N=36), which restrict causal inference and broader generalizability. To establish precise causal estimates, future research should utilize large-scale quantitative panel data combined with quasi-experimental methods, such as Regression Discontinuity Design (RDD) or Difference-in-Differences (DiD), leveraging geographic variation in airport land acquisitions. Ultimately, these findings highlight the broader significance of land financialization as a transformative welfare mechanism, offering a promising model for China's rural pension reforms that warrants further investigation at scale.

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