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Does Place of Residence Matter for Household Welfare? Evidence from West Nusa Tenggara Province

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ABSTRACT

This study examines the association between place of residence and household economic welfare in West Nusa Tenggara Province using microdata from the March 2025 National Socioeconomic Survey (Susenas). The analysis covers 5,990 households, each represented by a household head employed in formal or informal work. Welfare is proxied by monthly per capita expenditure, transformed into its natural logarithm. The model is estimated using least squares with WERT probability weights and heteroskedasticity-robust standard errors. Controlling for other characteristics, rural households have approximately 3.76 percent lower predicted per capita expenditure than urban households. A one-year increase in the household head's equivalent years of education is associated with 4.18 percent higher expenditure, while informal employment is associated with 20.64 percent lower expenditure than formal employment. An additional household member is associated with 17.29 percent lower per capita expenditure. Age exhibits an inverted-U relationship, with an estimated turning point of approximately 60.18 years, whereas the household head's gender is not statistically significant. These percentages follow the log-model interpretation in terms of conditional geometric means. The findings indicate that residence, education, employment status, and demographic characteristics are associated with household monetary welfare within the analytical sample. They provide empirical evidence to inform discussions of regional development and household economic support, without establishing causal relationships.

INTRODUCTION

Household welfare is a primary concern in economic development. An increase in a region's economic activity needs to be accompanied by the community's ability to meet its living needs. However, aggregate regional economic conditions do not fully reflect the disparities in welfare among households. Households residing in the same area may possess varying consumption capacities due to differences in education, employment, access to resources, and family characteristics. Therefore, assessing welfare requires analysis at the household level to understand these conditions.

Per capita expenditure can serve as a proxy for monetary well-being, as it reflects household consumption adjusted for the number of household members. (Deaton, 2018) explains the role of consumption data in measuring welfare through household surveys. In the Indonesian context, Susenas provides information on food and non-food consumption expenditures, enabling an analysis of household economic conditions. This study uses monthly per capita expenditure as an indicator of economic welfare. While this indicator offers an overview of consumption capacity, it does not encompass all dimensions of welfare or account for differences in needs among household members.

West Nusa Tenggara (NTB) serves as a significant context for examining the link between place of residence and well-being. In March 2025, the poverty rate in NTB stood at 11.78 percent. The poverty rate was 12.02 percent in urban areas and 11.51 percent in rural areas. These figures demonstrate that economic vulnerability exists in urban areas as well (BPS, 2025). However, the proportion of the population below the poverty line does not yet explain the differences in per capita expenditure once household characteristics are taken into account. Therefore, the relationship between place of residence and expenditure needs to be examined using micro-data that allows for comparisons between households.

Theoretically, the relationship between location and economic conditions can be understood through economic geography. (Krugman, 1991) explains that economies of scale, transportation costs, and market size can drive the concentration of economic activity. Consequently, locational differences may be linked to the employment opportunities and market access available to households. In an empirical study, (Wardhono et al., 2022) demonstrated the relevance of market access and financial literacy to consumption among Indonesia's rural population. (Rammohan & Tohari, 2023) also observed improvements in rural consumption when evaluating the Village Fund program. Both studies highlight the importance of rural economic opportunities, although they did not estimate locational differences using the same research design employed here.

Comparing urban and rural areas requires taking into account the characteristics of the households residing in them. Observed differences in expenditure may be linked to the education and occupation of the household head, as well as their age and gender, and the size of the household. Incorporating these characteristics into the analysis allows for an assessment of the relationship with place of residence after controlling for observed differences. This study focuses on whether rural households exhibit different per capita expenditure compared to urban households when household head characteristics and household size are comparable.

Education is a relevant characteristic for explaining household welfare, as it relates to the skills and income-earning opportunities needed to finance consumption. (Sugiharti et al., 2022) demonstrated that education is a significant factor in explaining chronic household poverty in Indonesia. Similarly, (Ekaputri et al., 2025), using 2023 Susenas data, found that the longer the duration of the household head's formal education, the lower the likelihood of the household experiencing poverty. Both studies provide empirical evidence regarding the link

between education and welfare, even though their indicators differ from per capita expenditure. This study specifically utilizes the household head's educational attainment measured in equivalent years of schooling and examines its relationship with household per capita expenditure in West Nusa Tenggara (NTB).

The employment status of the household head also warrants consideration, as formal and informal employment can differ in terms of remuneration and income stability. Using data from the 2014 IFLS, (Purwaningsih, 2021), identified a negative association between informal employment and per capita expenditure among female-headed households in Indonesia. These findings provide an empirical basis for including the household head's employment status in analyses of household expenditure. However, the fact that the previous study was limited to female household heads should be noted when making comparisons with the present study. Therefore, this study re-examines the relationship between formal versus informal employment and per capita expenditure among households in West Nusa Tenggara (NTB) where the household head whether male or female is employed.

Beyond education and employment, the age of the household head can be linked to the economic life cycle of the household. The life-cycle hypothesis explains patterns of consumption and saving over the course of a lifetime by taking into account available resources (Modigliani, 1986). This framework provides a rationale for examining a potential non-linear relationship involving age. (Mirdad et al., 2023) identified a hump-shaped age-consumption profile among remittance-receiving households in Indonesia, although the findings did not fully align with the predictions of the life-cycle hypothesis. Given these considerations, this study incorporates both age and age-squared terms to assess potential variations in the relationship between age and expenditure across different life stages.

Household size is linked to the allocation of resources and the shared use of goods. If resources do not increase in proportion to the number of members, per-person expenditure may be lower. Conversely, the shared use of housing and certain goods allows for cost savings. (Deaton & Paxson, 1998) discuss the relationship between household size, economies of scale, and food demand. These considerations are important because the number of members also serves as the denominator in calculating per capita expenditure. Therefore, household size is accounted for in the model while distinguishing per-person expenditure from the family's overall living conditions.

The gender of the household head is also a factor to consider, as access to employment and economic resources can differ between women and men. (Ekaputri et al., 2025) found that, on a national scale, female-headed households were less likely to be classified as poor once other characteristics were controlled for. Meanwhile, (Fadlli et al., 2026) found no significant relationship between gender and the welfare of farming households in West Nusa Tenggara (NTB). Both studies employed indicators and population scopes that differ from those of the present study; consequently, their results serve as points of comparison rather than a basis for concluding that one group enjoys superior welfare. Therefore, the relationship between the

gender of the household head and household per capita expenditure in NTB warrants examination while controlling for other characteristics.

Existing research on NTB provides local context but focuses on different aspects. (Afrianti, 2026) examined expenditure dynamics and the structure of food and non-food consumption across regencies and cities, whereas (Fadlli et al., 2026) analyzed the welfare of farming households. While both studies offer insights into economic conditions at the regional and specific household-group levels, they do not directly address the research question regarding differences in per capita expenditure based on place of residence after controlling for the characteristics of the household head and household size. This study complements that body of research by analyzing microdata from the March 2025 National Socio-Economic Survey (Susenas) regarding households in NTB where the head works in either the formal or informal sector.

Based on the literature, the research gap addressed is the need for micro-level evidence regarding the link between urban versus rural residence and household per capita expenditure in NTB, while simultaneously accounting for education, employment, age, household size, and the gender of the household head. This study positions place of residence as the primary variable and utilizes the March 2025 Susenas data to update empirical evidence within the NTB context. Its contribution lies in understanding the relationship between location and monetary well-being among households where the head works in either the formal or informal sector.

This study aims to analyze the relationship between place of residence and household per capita expenditure in NTB, while accounting for the education, employment status, age, and gender of the household head, as well as household size. It also assesses the association of each of these characteristics with per capita expenditure as an indicator of economic well-being. The findings are expected to enrich empirical evidence regarding disparities in household welfare in NTB and serve as a basis for regional development planning that considers household socio-economic and demographic characteristics.

METHODS

This study employs a quantitative approach using secondary data from the March 2025 National Socio-Economic Survey (Susenas) for West Nusa Tenggara Province. The data are cross-sectional, capturing household characteristics at a single point in time. The analysis is based solely on records of heads of households (HoH), with each HoH representing one household. The sample comprises 5,990 heads of households engaged in either formal or informal employment, representing 5,990 households. In this study, formal and informal employment refer to the two employment categories used to classify heads of households who were working. Heads of households who were not working were not included because the analysis focuses on comparing household welfare between households headed by individuals engaged in formal and informal employment. This sampling restriction was applied to ensure that the employment variable consistently represents the distinction between formal and informal employment within the employed population. The unit of analysis is the household. Variables such as education, employment status, age, and gender pertain to the head of the

household, while place of residence, household size, and per capita expenditure characterize the household itself.

The study aims to analyze the relationship between urban-rural residence and household economic well-being, after controlling for socio-economic and demographic characteristics. Based on this scope, the findings are interpreted with reference to the households represented by their working heads included in the analysis.

The dependent variable is the natural logarithm of monthly per capita expenditure. Logarithms are used to mitigate the influence of very large expenditure values and to facilitate the interpretation of coefficients as percentage changes. Place of residence is the primary variable, while other variables are used to control for differences in human capital, labor markets, the life cycle, and household structure.

Table 1. Definitions, measurements, and theoretical bases of the variables

Variable	Symbol	Measurement	Main theories	Allegation
Per capita expenditure	ln_capita	Logs of natural rupiah/capita/month	Consumption as a proxy for monetary well-being	–
Residence	rural	1 rural; 0 urban	Regional economy and spatial access	Negatives
Head of Household Education	education	School year (0–21)	Human capital theory	Positive
Head of Household Jobs	employment	1 informal; 0 formal	Job market segmentation	Negatives
Age of the Head of Household Centralized	age_c	Age − Average weight 45,435	Life cycle hypothesis	Positive before the turning point
Age squared	age_c2	age_c²	Nonlinear lifecycle relationships	Negative / Inverted U
Number of Household Members	hhsize	Number of members (1–11)	Resource sharing and economies of scale	Tends to be negative
Gender of Head of Household	gender	1 female; 0 male	Intra-household allocation and economic access	Negatives

Source: Compiled by the author based on data, theory, and previous research.

The education level of the household head (KRT) is converted into the equivalent number of years of schooling: 6 years for elementary school (or equivalent), 9 years for junior high school (or equivalent), 12 years for senior high school (or equivalent), 13 years for Diploma I, 14 years for Diploma II, 15 years for Diploma III, 16 years for Diploma

IV/Bachelor's degree (S1), 18 years for Master's degree (S2), and 21 years for Doctoral degree (S3). In this study's dataset, a value of 0 is assigned to household heads who attended school but did not complete elementary school (or its equivalent). Based on this measurement, the education variable reflects educational attainment as evidenced by a diploma or certificate, and thus does not fully capture the total number of years actually spent in school.

The age of the household head is included in both linear and quadratic forms to allow the relationship between age and per capita expenditure to vary across different age levels. As an empirical reference, (Mirdad et al., 2023) identified a hump-shaped age-consumption pattern among remittance-receiving households in Indonesia. That study supports examining the possibility of a non-linear relationship, while accounting for differences in the scope of the households analyzed.

The model estimates the conditional relationship between household characteristics and the logarithm of per capita expenditure. The form of the model used is:

$$ln(KAPITA_i) = \beta_0 + \beta_1 RURAL_i + \beta_2 EDUCATION_i + \beta_3 EMPLOYMENT_i + \beta_4 AGE_C_i + \beta_5 AGE_C^2_i + \beta_6 HHSIZE_i + \beta_7 GENDER_i + \varepsilon_i$$

In this equation, i denotes the household represented by a single household head, β_0 is the constant, β_1 through β_7 re the regression coefficients, and ε_i is the error term.

Centered age is defined as $AGEC_i = AGE_i - \overline{AGE}_w$, where $\overline{AGE}_w$ is the mean age of the household head calculated using the WERT weight. Centering age facilitates the interpretation of the linear age coefficient at the sample's weighted mean age.

The study's main hypothesis posits that rural residence is negatively associated with household per capita expenditure after controlling for education, employment status, age, household size, and the gender of the household head. Given this coding, a negative RURAL coefficient indicates lower per capita expenditure for rural households compared to urban households with similar observed characteristics.

Descriptive analysis is used to describe the characteristics of the heads of households and the households they represent. Categorical characteristics are presented using sample observation counts and weighted percentages based on WERT. Meanwhile, descriptive statistics for numerical variables—comprising the mean, standard deviation, minimum value, and maximum value—are presented without weighting to illustrate the data distribution within the analysis sample. The weighting status is indicated in the notes for each table.

Regression estimation employs the least squares method using WERT probability weights. These weights account for differences in household representation within the sample. The choice of weighting must align with the estimation objectives and survey characteristics. (Wang et al., 2023) demonstrate that the use of weights in survey data regression involves considerations regarding estimator bias and variance; thus, weighting requires a clear methodological justification.

This study utilizes heteroskedasticity-robust standard errors to calculate standard errors, confidence intervals, and significance tests, allowing for varying error variances across households. In Stata, estimation is performed using probability weights and the `vce(robust)` option. This approach adjusts the calculation of estimation uncertainty; the use of these standard errors does not eliminate the presence of heteroskedasticity in the data (StataCorp, n.d.).

Preliminary diagnostics were conducted on an unweighted OLS regression using the Variance Inflation Factor (VIF) to assess multicollinearity and the Breusch–Pagan/Cook–Weisberg test to check for heteroskedasticity. The null hypothesis for the heteroskedasticity test posits that error variance is constant; a p-value below 0.05 indicates rejection of this hypothesis. Preliminary diagnostic results are presented separately from the main estimation results, which utilize weights and robust standard errors.

Individual coefficient testing was conducted using the t-test, while the joint testing of all explanatory variables employed the F-test based on a robust covariance matrix. Linear age and age-squared were also tested jointly to assess their relationship with per capita expenditure. A 5% significance level was used for the tests. The coefficient of determination, R^2 is used to describe the proportion of the weighted variation in the logarithm of per capita expenditure explained by the model.

The dummy variable coefficient is converted into the percentage difference between the category coded as 1 and the reference category coded as 0 using the formula:

$$100(e^{\widehat{\beta}_j} - 1)$$

The same formula applies to a one-unit change in the education variable and the number of household members, which are included linearly in the log model. For education, one unit corresponds to one year of equivalent schooling based on the measurement used. Interpretation involves holding other variables constant and considering the difference in the geometric mean of expenditure predicted by the model.

The interpretation of age takes into account both the linear and quadratic coefficients simultaneously. The slope of the relationship between age and the logarithm of per capita expenditure at a specific age is:

$$\frac{\partial \ln(KAPITA_i)}{\partial\, AGE_i} = \hat{\beta}_4 + 2\hat{\beta}_5 AGEC_i$$

If the coefficient of the squared age term is negative, the age at the maximum point of the predicted curve is calculated as:

$$AGE^* = \overline{AGE}_w - \frac{\hat{\beta}_4}{2\hat{\beta}_5}$$

The turning point is interpreted by considering the age range within the data and its associated confidence interval. Calculations for the transformed coefficient and the confidence interval of the turning point were performed using the delta method via the `nlcom` command in Stata.

The study results are interpreted as statistical relationships conditional on the characteristics included in the model. The cross-sectional design limits the ability to draw causal inferences. Furthermore, the standard error calculations in this estimation do not incorporate specific adjustments for survey clusters and strata; this limitation should be taken into account when assessing the precision of the inferences.

RESULTS AND DISCUSSION

Table 2 presents the characteristics of 5,990 households. The sample percentage column illustrates the composition of the data rows, whereas the weighted percentage reflects the

composition of the population represented by WERT. Therefore, the weighted figures serve as the primary basis for describing the respondent profile.

Table 2. Respondent demographics and household characteristics

Variable	Category	n Sample	% sample	% Weighty
Residence	Urban	3.151	52,60	51,46
	Rural	2.839	47,40	48,54
Gender of Head of Household	Male	5.157	86,09	90,72
	Female	833	13,91	9,28
Job of the Head of Household	Formal	2.012	33,59	32,30
	Informal	3.978	66,41	67,70
Age of Head of Household	17–34 Year	1.120	18,70	20,33
	35–44 Year	1.780	29,72	29,84
	45–54 Year	1.722	28,75	26,81
	55–64 Year	1.012	16,89	16,79
	65 Year and above	356	5,94	6,22
Head of Household Education	0 Year	903	15,08	15,38
	6 Year	1.628	27,18	28,99
	9 Year	966	16,13	16,65
	12 Year	1.730	28,88	26,84
	13 years or more	763	12,74	12,14
Number of Household Members	1–2 people	1.471	24,56	15,50
	3–4 people	3.413	56,98	61,45
	5–6 people	1.033	17,25	21,38
	7 or more people	73	1,22	1,67

Source: Processed data from Susenas March 2025; weighted percentages using WERT.

In weight, 51.46 percent of households are in urban areas and 48.54 percent are in rural areas. The majority of KRTs are men (90.72 percent), while the number of KRTs is women, amounting to 9.28 percent. The employment structure is dominated by the informal sector at 67.70 percent. The largest age group is 35–44 years (29.84 percent), followed by 45–54 years

(26.81 percent). The most education was 6 years (28.99 percent) and 12 years (26.84 percent). The majority of households have 3–4 members (61.45 percent). The dominance of informal work is an important context because this variable produces the largest expenditure gap in the model.

Table 3. Descriptive statistics of numerical variables

Variable	N	Rata-rata	SD	Minimum	Maximum
Expenditure per capita (Rp)	5.990	1.664.192	1.574.131	309.497	34.424.333
Per capita spending log	5.990	14,0815	0,6494	12,6427	17,3543
Head of Household Education (year)	5.990	8,5801	4,8309	0	21
Age of Head of Household (years)	5.990	45,6486	11,7362	17	90
Number of Household Members (persons)	5.990	3,4140	1,3023	1	11

Source: Data processing results. The numerical statistics in this table are unweighted sample statistics.

The average per capita expenditure for the sample is around IDR 1.66 million per month, but the range is quite wide from around IDR 309 thousand to IDR 34.42 million. Log transformation is used so that observations with very high expenditures do not dominate the estimates. The average education of household heads is 8.58 years, the average age is 45.65 years, and the average number of household members is 3.41 people. Age centering in the model uses a weighted mean of 45.435 years, so it differs slightly from the unweighted sample mean.

Table 4. Summary of classical assumption tests

Testing	Results	Verdict
Multicollinearity	VIF maximum 1,29; mean VIF 1,18	There is no indication of annoying multicollinearity
Heteroskedasticity	$\chi^2(7) = 154,17$; $p < 0,001$	Residual variance is not constant; use robust standard error

Source: Stata processing results.

In the unweighted OLS diagnostics, all VIF values fall well below the common threshold of 10, indicating no problematic multicollinearity. The Breusch–Pagan/Cook–Weisberg test rejects the hypothesis of constant residual variance, as the p-value is less than 0.001. Consequently, the primary weighted estimation relies on robust standard errors. For a given model and set of weights, the use of robust standard errors alters the standard error calculation rather than the coefficients themselves. In contrast, the inclusion of weights (WERT) can alter the coefficients because the contribution of each observation to the estimation changes. Robust

standard errors do not, in themselves, address model misspecification or all aspects of the survey design.

The final estimation utilizes 5,990 observations with the probability weight WERT and robust standard errors. The coefficient estimates, p-values, confidence intervals, and percentage changes are presented in Table 5.

Table 5. Weighted OLS regression results with robust standard errors

Variable	Koef.	Robust SE	t	p-value	IK 95%	Meaning of percentage
Rural	−0,03837	0,01869	−2,05	0,040	−0,07501; −0,00173	−3,76%
Head of Household Education	0,04099	0,00240	17,06	<0,001	0,03628; 0,04570	+4,18%
Informal work	−0,23117	0,02288	−10,11	<0,001	−0,27601; −0,18632	−20,64%
Age-centered	0,01002	0,00087	11,51	<0,001	0,00831; 0,01172	+1,00%[a]
Age squared	−0,000340	0,000052	−6,52	<0,001	−0,000442; −0,000238	Inverted U
Number of Household Members	−0,18988	0,00813	−23,35	<0,001	−0,20582; −0,17394	−17,29%
Female Head of Household	0,01331	0,02999	0,44	0,657	−0,04547; 0,07209	+1,34% (insignificant)
Constant	14,581114	0,04501	323,94	<0,001	14,4929; 14,6694	–

Source: Stata output. N = 5.990; F(7,5982) = 170,86; p < 0,001; R^2 = 0,2617; Root MSE = 0,53382. [a] Age changes are calculated around the weighted mean; dummy/level percentages are calculated using nlcom.

Residence

The rural coefficient is −0.03837 with p = 0.040 indicating a negative and significant relationship at the 5 percent level. After controlling for education, occupation, age, number of household members, and gender of household heads, rural household per capita expenditure is estimated to be 3.76 percent lower than urban areas. This percentage comes from the log prediction difference which is exponentiated, so it refers to a comparison of conditional geometric means. The same understanding applies to the interpretation of percentages of other variables below; This figure is not a direct difference between the average rupiah in descriptive statistics.

These findings align with (Agyepong et al., 2026), who found that rural household consumption expenditure in Ghana was lower than that of urban households, even when measured on an adult-equivalent basis. In the Indonesian context, (SUDARYANTO et al., 2023) demonstrated that the development of high-value agriculture and rural non-farm employment is associated with increased household income. While both studies provide context regarding the links between location, economic opportunities, and well-being, the role of economic opportunities in explaining expenditure disparities in NTB has not been directly examined in the present study.

These regression results can be viewed alongside NTB's poverty figures for March 2025 specifically 12.02 percent in urban areas and 11.51 percent in rural areas (BPS, 2025). Poverty figures measure the proportion of the population living below the poverty line in each respective area, whereas this model compares the log of per capita expenditure across households after controlling for other characteristics. Differences in the unit of analysis, poverty thresholds, and statistical metrics mean that the two sets of results do not necessarily reflect the same ranking.

Head of Household Education

The education of the household head has a coefficient of 0.04099 ($p < 0.001$). A one-year increase in educational attainment is associated with per capita expenditure that is approximately 4.18 percent higher, holding other characteristics constant. Since education is measured based on the level completed, this interpretation refers to the equivalent years of schooling within the model, rather than an additional year of observed school attendance. Within the human capital framework, education can expand knowledge, skills, and income-earning opportunities (Becker, 1964).

Using data from the 2023 National Socio-Economic Survey (Ekaputri et al., 2025), found that the longer the formal education of the household head, the lower the likelihood of the household experiencing poverty. These findings support the link between the household head's education and welfare, although the indicator used was poverty status rather than per capita expenditure. However, results from previous studies have not been entirely consistent. In a sample of female household heads, (Purwaningsih, 2021) found education to be significant in Model 2, but not significant after household characteristics were added in Model 3. These discrepancies indicate that the relationship between education and welfare must be understood in the context of the specific population and model specifications. This study provides evidence of a positive relationship between the education of the household head and per capita expenditure in West Nusa Tenggara (NTB), without interpreting this as a causal effect.

Head of Household Employment Status

The coefficient for informal employment of -0.23117 ($p < 0.001$) indicates that households with heads employed in the informal sector have per capita expenditure approximately 20.64 percent lower than those with heads employed in the formal sector, after controlling for other variables. This figure reflects the difference between employment categories rather than the specific change in expenditure an individual would experience upon switching jobs.

These findings align with (Purwaningsih, 2021), who identified a negative relationship between informal employment and per capita expenditure among female-headed households in Indonesia. For comparison, (Gusti Ayu Nyoman Dewi Ariyani & Ida Ayu Nyoman Saskara2, 2023) studied 100 heads of households in Denpasar City and found that employment status was significantly associated with consumption expenditure, alongside a positive interaction between income and employment status. Because the model incorporated an interaction term, the coefficient for employment status cannot be interpreted as a constant formal–informal gap across all income levels. Differences in sample coverage, consumption measurement, and model specification mean that the magnitude of the results cannot be directly equated with those of the present study.

Differences in income stability and job security offer a potential economic explanation for the observed expenditure gap. However, as these mechanisms were not directly measured in this study, the estimation results reflect the relationship between the household head's employment status and per capita expenditure. The fact that informal workers constitute 67.70 percent of household heads in the weighted profile underscores the relevance of these findings for the households analyzed in NTB. Nevertheless, informal employment encompasses a wide range of activities and income levels; thus, this negative relationship does not imply that all households headed by informal workers share identical economic conditions.

Age of Head of Household

The coefficient for centered age is 0.01002, and for centered age squared it is −0.000340, with $p < 0.001$ for each. A joint test of both age components yields $F(2, 5982) = 76.25$, $p < 0.001$. The combination of these coefficients indicates an inverted-U relationship between the age of the household head and predicted log per capita expenditure, controlling for other characteristics. The turning point is estimated at 60.18 years of age, with a 95% confidence interval of 55.50–64.85 years. Predicted per capita expenditure increases up to this point and subsequently declines. The figure of approximately 1.00 percent in Table 5 represents an approximation of the local age relationship around the weighted mean of 45.435 years; thus, it does not represent a constant percentage increase across all ages.

This pattern can be understood through a life-cycle approach that links consumption to changes in income and resources over the course of a lifetime, as discussed by (Tran, 2022) n the context of Vietnamese households. For empirical comparison, (Tesgera et al., 2024) ound a positive relationship between age—and a negative relationship between age squared—and rural household consumption in Ethiopia. (Mirdad et al., 2023) also identified a consumption profile by age that peaked among remittance-receiving households in Indonesia, although the results did not fully align with life-cycle hypothesis predictions. These findings provide context for the non-linear relationship with age, without implying that coefficient magnitudes or turning points are identical across studies. Since this study utilizes cross-sectional data, the resulting curve compares heads of households of different ages at a single point in time rather than tracking consumption changes within the same family over a lifetime. Consequently, the turning point at approximately 60 years of age cannot be interpreted as the precise age at which every household’s consumption declines.

Number of Household Members

Household size has a coefficient of −0.18988 ($p < 0.001$). An increase of one household member is associated with per capita expenditure that is approximately 17.29 percent lower, after controlling for other characteristics. This finding aligns with (Purwaningsih, 2021) who identified a negative relationship between household size and the logarithm of per capita expenditure in the full model for a sample of female household heads. Meanwhile, (Kusdianto & Bulan Samosir, 2023) found that the number of elderly members is associated with lower welfare in elderly-headed households. Although these studies measure different aspects of household composition, they provide context indicating that the number and characteristics of members must be considered when understanding household economic conditions.

From an economic perspective, per-person expenditure may decline if household resources do not increase in proportion to the number of household members. This interpretation must also account for the fact that the number of members serves as the denominator in the calculation of per capita expenditure. However, households can achieve cost savings through the shared use of housing and certain goods. In a study of households in Iran, (Mehrjou & Bakhshoodeh, 2025), found that economies of scale in consumption were greater for housing expenditure than for food expenditure. These findings provide context indicating that expenditure requirements do not always rise in direct proportion to the number of members. Therefore, while the negative relationship observed in this study reflects lower per capita expenditure, it is insufficient to conclude that there is a decline across all dimensions of household welfare.

Gender of the Head of Household

The coefficient for female household heads (0.01331) corresponds to a difference in per capita expenditure of approximately 1.34 percent compared to male household heads. However, the p-value of 0.657 and the confidence interval—which includes zero—indicate that this difference is not statistically significant. Thus, this study has not found evidence of a difference in per capita expenditure based on the gender of the household head after controlling for other characteristics. These results do not prove that the two groups share the same level of welfare, nor is the positive coefficient sufficient to conclude that households headed by women enjoy superior welfare.

In the context of West Nusa Tenggara (NTB), reported that gender was not significant in a model of farmer household welfare, although their study involved a specific population scope and utilized categorical welfare indicators. For international comparison, (Jaen et al., 2024) found that female-headed households in Mexico allocated a higher proportion of food expenditure to milk, dairy products, and fruit, but a lower proportion to sweetened beverages and alcohol. While that study examined the composition of food expenditure, the present research measures total per capita expenditure; consequently, the findings cannot be viewed as directly contradictory. The lack of statistical significance regarding the gender of the household head in this study does not resolve the question of whether consumption allocation differs between female-headed and male-headed households. Thus, the relationship between gender and welfare must be interpreted in light of the specific indicators, population scope, and household characteristics taken into account.

Model Fit and Simultaneous Test

The F-statistic of 170.86, with a p-value of less than 0.001, leads to the rejection of the hypothesis that all explanatory coefficients are simultaneously equal to zero. This implies the existence of at least one non-zero relationship within the model, though it does not mean that all variables are individually significant. Gender remains insignificant according to the t-test. The weighted R-squared of 0.2617 indicates that the model explains 26.17 percent of the variation in the log of per capita expenditure in weighted terms. The remaining 73.83 percent represents variation unexplained by the model, potentially arising from omitted factors, individual variation, and measurement error. This R-squared value does not automatically determine whether the model is good or bad; assessment must still consider theory, data quality, specification, and the validity of inferences (Wooldridge, 2020).

New Findings and Empirical Contributions

Four key findings can be highlighted. First, per capita expenditure among rural households is approximately 3.76 percent lower than that of urban households after controlling for other characteristics. Second, households headed by informal workers have per capita expenditure about 20.64 percent lower than those headed by formal workers. The magnitude of this difference between employment categories exceeds that of the location-based difference, although this study did not directly test the difference between the two coefficients. Third, the relationship between the household head's age and per capita expenditure follows an inverted U-shape, with a turning point at approximately 60 years of age. Fourth, household size is significantly and negatively associated with expenditure, whereas the gender of the household head shows no significant relationship. These findings underscore the importance of considering employment status, the age of the household head, and household size when understanding welfare disparities based on place of residence.

This study contributes by providing empirical evidence at the household level in NTB, utilizing data from the March 2025 Susenas survey. Existing local studies have focused on different aspects, such as inter-regional consumption structure dynamics (Afrianti, 2026) and the welfare of farming households (Fadlli et al., 2026). This research complements those studies by analyzing the relationship between place of residence and per capita expenditure among households where the head is employed, while accounting for factors such as education, formal versus informal employment status, a quadratic age pattern, household size, and the gender of the household head. The use of survey weights in the estimation process ensures that the contribution of each observation is accounted for according to its weight. Thus, the study offers an empirical and contextual contribution to understanding the relationship between place of residence and household welfare in NTB.

Limitations of the Study

This study utilizes cross-sectional data; therefore, it cannot establish a causal relationship. Variables that are unavailable or omitted may account for differences in the magnitude of the coefficients. The use of probability weights (pweights) and robust standard errors does not fully account for Primary Sampling Units (PSUs) and strata; consequently, future research particularly regarding the rural coefficient, where the p-value is close to 0.05 could employ the

full survey design. Furthermore, the coefficient for household size should be interpreted in light of the fact that per capita expenditure uses household size as the denominator.

CONCLUSION AND RECOMMENDATIONS

This study demonstrates a link between place of residence and household per capita expenditure in NTB, based on a sample of 5,990 households where the head of the household (HOH) is employed in either the formal or informal sector. After controlling for other characteristics, rural households were found to have a predicted per capita expenditure approximately 3.76 percent lower than that of urban households. These findings support the primary hypothesis regarding the negative association between rural residence and per capita expenditure.

The education level of the household head is positively associated with per capita expenditure, whereas informal employment and household size show a negative association. Age exhibits an inverted U-shaped relationship, with an estimated turning point at approximately 60.18 years. The gender of the household head does not show a significant relationship once other characteristics are taken into account. These results indicate that an analysis of household welfare needs to consider place of residence alongside characteristics such as education, employment, age, and family structure. This conclusion applies within the scope of the analysis and does not imply a causal relationship.

The policy implications of these findings should particularly address the welfare gap associated with informal employment, which shows the largest difference among the employment categories in the model. Policies may focus on gradual formalization through access to business registration, financial services, skills certification, and formal employment opportunities, alongside stronger social protection for informal workers. Human capital development through skills training and productivity enhancement can also support better economic opportunities. These efforts can be complemented by improving access to economic opportunities and essential services in rural areas, rather than focusing solely on physical infrastructure. Household support may also consider differences in age stages and family composition.

These policy directions are based on observed statistical relationships and do not establish that the proposed programs would directly improve household welfare; their effectiveness requires separate evaluation. Future research could use a more comprehensive survey design and incorporate household assets, the composition of income earners, and inter-regional price differences to deepen the analysis of household welfare.

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