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ABSTRACT

Employing Data Imputation to Track Poverty and Welfare Trends over Extended Time Periods: An Application to a Poorer Country*

Obtaining comparable poverty estimates over time is critical for monitoring poverty trends and informing effective poverty reduction policies. Yet hardly any developing countries could construct consistent poverty trends over extended time periods due to changes to the consumption survey questionnaires and poverty lines that reflect changing consumption patterns and living standards. Furthermore, spatial and temporal deflators could be unavailable or could have been unsystematically employed, which could result in worsening incomparability of consumption aggregates. We propose a solution to these data challenges by applying data imputation to 13 survey rounds for Viet Nam during 1993-2022. Our results provide new, comparable, and smoother estimates of poverty trends for Viet Nam. We also offer a useful case study for other similar contexts.

JEL Classification: C15, I32, O15

Keywords: poverty imputation, living standard, poverty, household surveys, Viet Nam

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1. Introduction

The first Sustainable Development Goal calls for eliminating poverty in all its forms worldwide.[1] Accurate poverty measurement offers essential inputs for designing and evaluating poverty reduction policies, in both richer and poorer countries alike. Yet, while measuring poverty trends well requires consistent and comparable measurements of household consumption (and poverty lines) over time, such consumption data is not always available, particularly for poorer countries (Beegle *et al.*, 2016; World Bank, 2021). Moreover, even countries that have implemented household surveys for longer periods of time still face the challenges of inconsistent consumption data due to various reasons. Notable cases include India and Viet Nam, where changes with questionnaire design and updates to methodologies to construct the consumption aggregates and the appropriate poverty lines have resulted in incomparable poverty trends (Deaton and Kozel, 2005; Dang and Lanjouw, 2018; World Bank, 2022; Roy and Van der Weide, 2025). As such, there have been various calls to consider alternative data generation techniques in data-challenging contexts to address data gaps (World Bank, 2017 and 2021; Dang *et al.*, 2025a).

Employing data imputation, we construct time-consistent estimates of welfare indicators, including per capita consumption and the poverty rate, for Viet Nam. The key idea of our survey-to-survey imputation is to estimate a consumption model using household characteristics from a survey (the base survey). This model is subsequently applied to another survey (the target survey), which contains information on the same household characteristics but lacks consumption data, in order to predict household consumption . In our study, the aggregate consumption consumptions constructed in more recent rounds of the Viet Nam

[1] See https://www.un.org/sustainabledevelopment/poverty/.

Household Living Standards Survey (2010 and later) are more comprehensive and better captures household living standards. Consequently, we use a survey during the 2010-2022 period as the base survey to impute for comparable consumption and poverty measures in the 1993-2008 period.

We find that the imputed (headcount) poverty rates are respectively 78.4%, 60.5%, and 22.9% for 1993, 1998, and 2008. These imputed (and comparable) poverty rates are considerably higher than the corresponding (incomparable) observed poverty rates of 58.1%, 37.4%, and 14.5%. By combining the imputed estimates for the 1993-2008 period with the observed estimates for the 2010-2022 periods, we can construct time-consistent trends in welfare indicators over time. Our results are robust to various robustness checks, including estimating the model errors parametrically or nonparametrically, using different methods to select model variables, and employing alternative base surveys. We also find that choosing a specific base year could also bring implications on the living standards (and associated poverty levels) that are analyzed.

Our study makes several new contributions to the literature on poverty measurement and welfare analysis in poorer countries. First, applying data imputation to 13 household surveys, we offer the first study that attempts to construct harmonized and time-consistent estimates of per capita consumption and poverty rates in Viet Nam over the past three decades.[2] Our consistent poverty estimates could provide policymakers as well as researchers

[2] Previous poverty imputation studies for Viet Nam predict poverty over space for administratively smaller areas (poverty mapping) (Nguyen, 2012; Lanjouw *et al.*, 2017; Nguyen, 2024). While some survey data from Viet Nam was used for illustrative purposes with poverty imputation over short time periods in several other studies (Dang *et al.*, 2024; Dang *et al.*, 2025c), these studies do not focus on constructing time-consistent poverty trends over extended time periods as we do in this paper. See also Dang *et al.* (2019) and Dang and Lanjouw (2023) for recent reviews of the poverty imputation literature.

with a robust empirical basis to assess the change in living standards since the first household consumption survey was implemented in 1992/1993, which, to our knowledge, has never been available to date.

The country offers an interesting case study. Since adopting economic reforms in the late 1980s, Viet Nam has achieved a steady annual economic growth rate of around 6%, which led to substantial poverty decline. To monitor living standards and poverty, Viet Nam's National Statistical Office (NSO), with technical support from the World Bank, has conducted the Viet Nam Living Standards Surveys in 1992/1993 and 1997/1998 (hereafter referred to as 1993 and 1998 for brevity) and the Viet Nam Household Living Standards Surveys biennially since 2002. These surveys provide the official consumption survey data underlying the poverty estimates in Viet Nam. These surveys show that the (observed) poverty rate in Viet Nam declined significantly from 58.1% in 1993 to 37.4% in 1998, and further to 14.5% in 2008 (World Bank, 2012).

However, the NSO and the World Bank revised the method to calculate consumption aggregates, as well as the poverty lines, to better reflect improvements in living standards starting in 2010 (World Bank, 2012). Under this updated methodology, the poverty rate was estimated at 20.7% in 2010 and continued to decline to 6.2% by 2022. Thus, there is a sharp increase in both per capita consumptions and the poverty rates between 2008 and 2010 (Figures 1 and 2). As a result, poverty estimates for the 1993–2008 period are not directly comparable with those from 2010 onward.[3]

[3] Unless noted otherwise, all the poverty estimates that we refer to are design-based (survey-based) poverty estimates, which we hereafter refer to as "observed poverty estimates" or "direct poverty estimates". These estimates are obtained based on the standard calories need-based approach (World Bank, 2012). We refer to the imputation-based (model-based) poverty estimates as the "imputed poverty estimates".

Second, our study could provide useful, practical inputs for implementing survey-to-survey imputation to produce consistent and reliable poverty estimates over time in other similar contexts beyond Viet Nam. Most previous studies focus on imputation with surveys covering relatively shorter time periods of 10 years or less.[4] In contrast, our data includes 13 household surveys, spanning an extended time period of 30 years, from 1993 to 2022. We estimate and evaluate several imputation models, including both structural (theory-based) and data-driven specifications. In addition, we assess the relevance of each of the seven VHLSS surveys from 2010 to 2022 as a potential base survey for imputation. By comparing estimation accuracy across imputation models and base surveys, we can find the most appropriate model and base survey for imputing per capita consumption and poverty measures for the 1993–2008 period. Our study highlights the practical issues in constructing time-consistent welfare measures due to changes with survey design and poverty measurement methodologies. These challenges affect many surveys around the world, including even countries that are known to have established and high-quality household surveys.

The paper has five sections. Section 2 presents the dataset and provides a descriptive analysis of consumption and poverty measures in Viet Nam. Sections 3 and 4 outline the methodology and present the main estimation results. Section 5 provides additional results for different population groups and geographical regions. Finally, Section 6 summarizes the key findings and suggests several policy recommendations.

[4] To our knowledge, Dang *et al.* (2024) apply imputation to the most comprehensive database to date, which consists of 22 survey rounds from six countries conducted over the past decade.

2. Data and descriptive analysis

2.1. Data

We analyze household surveys from Viet Nam conducted between 1992/93 and 2022. These surveys were carried out by the General Statistics Office (NSO) of Viet Nam with technical assistance from the World Bank, following the World Bank's Living Standards Measurement Study (LSMS) methodology. The surveys provide data on a wide range of topics, including household consumptions and income, education, health, employment, migration, housing conditions, savings, and participation in poverty reduction programs. In addition to household questionnaires, the surveys also included commune-level questionnaires (for rural areas only).

The 1993 Viet Nam Living Standards Survey (VLSS) was conducted between October 1992 and October 1993, covering a sample of 4,800 households. In both the 1993 and 1998 VLSSs, the sample strata were based on six regions and urban/rural classifications. The 1993 VLSS sample was drawn from 150 communes across the country, including 120 rural and 30 urban communes. Each commune included two enumeration areas (villages), and 16 households were randomly selected from each village, resulting in a total sample size of 4,800 households. In the 1998 VLSS, the number of sampled communes increased to 194, and the number of villages rose to 370. Approximately 16 households were randomly selected from each village, although in some villages the number slightly exceeded 16. The total sample size for the 1998 VLSS was 6,000 households.

Since 2010, the Viet Nam Household Living Standards Surveys (VHLSSs) have used provinces (63 in total) and urban/rural classifications as sampling strata, resulting in 126 strata. Communes serve as the primary sampling units, and around 3,100 communes are randomly selected, with the exact number depending on the sample size allocated to each

stratum. Within each selected commune, one village is randomly chosen. In the 2010 VHLSS, 10 households were randomly selected from each village, resulting in a sample size of nearly 30,000 households. Since the 2004 VHLSS, however, only 3 households have been selected from each village, yielding a sample size of approximately 9,000 households per survey round. Table A.1 in the Appendix presents the number of observations from the VLSSs and VHLSSs used in our final analysis. With the exception of the (self-weighted) 1993 VLSS, all the surveys include sampling weights, which we use in all estimation to provide nationally representative estimates.

It should be noted that the timing of interviews varies across survey rounds. Table A.1 presents the number of households surveyed in each round by month of interview. The 1993 and 1998 VLSSs conducted interviews throughout the year with a relatively even distribution. In the 2002 VHLSS, households were also interviewed each month, with the largest number of interviews taking place in May and June. In the 2004 to 2010 VHLSS rounds, interviews were primarily conducted between July and October. From 2010 to 2020, interviews were mainly carried out in March, June, September, and December. In the 2022 VHLSS, interviews were evenly distributed across all months.

2.2. Consumption

Consumption has been traditionally used as the main welfare indicator and for measuring poverty in Viet Nam. These consumption aggregates are constructed by NSO, typically with technical assistance from the World Bank. But over time, the number of food and non-food items included in the surveys has increased. For example, in the 1993 and 1998 VLSSs, households were asked about 45 daily food items and 15 daily non-food items. These

numbers increased to 57 and 22, respectively, in the 2002–2008 VHLSSs. Since 2010, the number of daily food and non-food items has increased to 58 and 29, respectively. The number of annual non-food items was 51 in the 1993 VLSS and remained constant until the 2008 VHLSS. Since the 2010 VHLSS, several annual non-food items have been combined, reducing the total number to 44.

Since 1993, the NSO and the World Bank have constructed consumption-based poverty lines, including the food poverty line and the overall poverty line. Households that fall below the food poverty line are considered food poor and unable to meet a minimum caloric intake of 2,100 Kcals per day. Households that are above the food poverty line but below the overall poverty line, could meet the minimum caloric intake but do not have allowance for essential non-food consumptions. In contrast, households at or above the overall poverty line have per capita consumptions adequate to meet both nutritional requirements and basic non-food needs. The nominal poverty line increased from 1,160 thousand VND in 1993 to 1,790 thousand VND in 1998, adjusting to account for regional price differences and monthly price fluctuations over the survey period. For consistent measures of poverty, the NSO and the World Bank keep the same definition of aggregate consumption as well as the poverty line for the period 1993-2008.

Figure 1 illustrates trends in per capita consumption and poverty headcount rates in Viet Nam from 1993 to 2022 estimated from VLSSs and VHLSSs using the NSO and the World Bank approach. Panel A shows the trend of per capita consumption in both nominal and real (constant 2022) prices. The figure indicates a steady increase in both nominal and real consumptions from 1993 to 2008. Panel A shows that the poverty rate decreased from 58.1% in 1993 to 37.4% in 1998 and to 14.5% in 2008.

Since 2010, the NSO and the World Bank have recognized that the living conditions of poor households have improved substantially compared to 1993, necessitating an update of both the consumption aggregate and the poverty line (World Bank, 2012). The consumption aggregate was subsequently constructed in a more comprehensive manner, incorporating a greater number of food and nonfood items. Additionally, the method for estimating the value of housing services was also revised. Prior to 2010, housing value was imputed using fixed rates—11.8% of nonfood consumption for rural households and 21.4% for urban households. Starting with the 2010 VHLSS, housing service consumption for each household is estimated as a constant proportion of the reported market value of the dwelling. This proportion, fixed at 2.88% for all households, reflects the median ratio of annual rent to dwelling sales value among households that reported renting their homes (World Bank, 2012). The comprehensive revision in constructing the aggregate consumption measure resulted in a substantial increase in per capita consumption between 2008 and 2010, with nominal per capita consumption rising from 17,516 thousand VND to 30,886 thousand VND. Per capita consumption continued to increase, reaching 48,333 thousand VND in 2020, before declining to 45,658 thousand VND in 2022 due to the adverse effects of the COVID-19 pandemic.

An updated consumption poverty line was constructed using a similar methodology to the original NSO–World Bank poverty line, but based on more recent consumption patterns from the 2010 VHLSS and a revised caloric requirement of 2,230 kilocalories per person per day, replacing the previous norm of 2,100 kilocalories. Panel A of Figure 2 shows the substantial increase in the poverty line, from 3,358 thousand VND in 2008 to 7,836 thousand VND in 2010. This increase reflects changes in the food reference basket, which

shifted toward higher-quality food items and allocated a larger share to nonfood consumption (World Bank, 2012). Panel B of Figure 2 shows the poverty rate decreased from 1993 to 2008 remarkably but increased in 2010 due to the changes in consumption aggregate and the poverty line.

2.3. Poverty measures

In this study, in addition to per capita consumption and the poverty headcount rate, we also examine other poverty measures, including the poverty gap index. The poverty gap index follows Foster *et al.*'s (1984) family of poverty indexes

$$Poverty\_gap = \frac{1}{n}\sum_{i=1}^{n}\left[\frac{z-y_i}{z}\right] I(y_i < z), \quad (1)$$

where n is the number of people, y_i is per capita consumption, z is the poverty line, and $I(y_i < z)$ denotes an indicator function that equals 1 if $y_i < z$, and 0 otherwise. The poverty gap index captures not only the proportion of the population that is poor but also the extent to which their per capita consumption falls below the poverty line. In addition, we use the USAID poverty gap index, as defined by USAID. Unlike the traditional poverty gap index, which is calculated over the entire population, the USAID poverty gap index is computed only for the poor. This measure focuses specifically on the depth of poverty among the poor population.

In addition, we estimate the food poverty rate. In Viet Nam, the NSO and the World Bank constructed both overall and food poverty lines. The overall poverty lines are presented in Figure 2. Since 2014, the food poverty lines have not been officially updated, possibly due to the very low incidence of food poverty in Viet Nam in recent years. Nonetheless, this study

continues to measure the food poverty rate, since we aim to track poverty trends back to 1993, when food poverty was still prevalent. For consistency, we set the food poverty line at 70% of the overall poverty line for all years. This proportion is based on the food poverty line estimated by the NSO and the World Bank in 2010, which was 6,525 thousand VND—approximately 70% of the overall poverty line in that year.

We also estimate the vulnerability rate, defined as the proportion of individuals whose per capita consumption lies between the poverty line and 130% of the poverty line. This threshold corresponds to the "near-poor" classification (i.e., 30% above the official poverty line), which has been adopted by the Government of Viet Nam to identify households at risk of falling into poverty (World Bank, 2012).

Table 1 presents estimates of various poverty indicators. The point estimates as well as standard errors are adjusted according to the complex survey sampling designs of VLSSs and VHLSSs. It shows a decline in poverty across all measures during both the 1993–2008 and 2010–2022 periods. In 2022, per capita consumption declined slightly and poverty increased marginally compared to 2020, reflecting the adverse impact of the COVID-19 pandemic. Due to changes in the construction of consumption aggregates and poverty lines, consumption and poverty estimates between the 1993–2008 and 2010–2022 periods are not comparable. Time-consistent estimates are therefore necessary, and this issue will be addressed in the following sections.

3. Analytical method

In a given period, a household makes decisions to maximize its utility subject to income constraints. Disposable income is allocated to the consumption of goods and durable assets,

as well as to savings (Deaton and Muellbauer, 1980). Total household consumption is typically measured as the combined consumption across various categories, including food, non-food items (such as clothing, education, and health), durable goods, and housing (Deaton and Zaidi, 2002). In practice, a reduced-form consumption model is usually employed where household consumption is regressed on various household and community characteristics such as household demographics, assets and durables, human capital, and community characteristics (Glewwe, 1991; Elbers *et al.*, 2003; Ravallion, 2016).

To impute for missing consumption in the target survey, the fundamental idea underlying survey-to-survey imputation is to construct a reduced-form consumption model using observable characteristics that are available in both the base and target surveys. Specifically, a model of household consumption is first estimated using the base survey (with consumption data), which is then applied to the target survey (without consumption data) to impute for household consumption in the latter survey.

Building on Elbers *et al.*'s (2003) "poverty mapping" method that imputes from a survey into a census, recent poverty imputation studies have innovated in various aspects regarding survey-to-survey imputation. These include combining data between a household consumption survey and a different survey (Stifel and Christiaensen, 2007; Douidich *et al.*, 2016), modelling techniques for the error terms or standard errors (Tarozzi, 2007; Mathiassen, 2009; Dang, Lanjouw, and Serajuddin, 2017), allowing for different seasonal coverage in surveys (Mathiassen and Wold, 2021), and experimenting with survey design and selecting suitable variables (Kilic and Sohnesen, 2019; Christiaensen, Ligon, and Sohnesen, 2022; Dang *et al.*, 2025c; Dang *et al.*, forthcoming). Survey-to-survey imputation has also been employed to provide estimates for hard-to-find refugee population groups that

are not typically captured in the standard household survey (Altındağ *et al.*, 2021; Dang and Verme, 2023; Beltramo *et al.*, 2024; Sarr *et al.*, 2025) as well as other poverty and vulnerability indicators beyond headcount poverty (Dang *et al.*, 2024).

We employ the survey-to-survey imputation framework proposed by Dang *et al.* (2017) and Dang *et al.* (2024 and 2025c) to estimate poverty indicators in the absence of consumption data. This method has been validated and applied to data from poor and middle-income countries in different regions and different population groups.[5]

In our study, consumption data are available from VLSS 1993 to VHLSS 2022. However, the consumption data are not comparable between the 1993-2008 period and the 2010-2022 period. We use a base survey during the 2010-2022 period, for example the 2016 VHLSS, to impute for consistent consumption in the 1993-2008 period. We begin with estimating the following consumption (imputation) model

$$Log(y_{1,ij}) = X_{1,ij}\beta_{1,ij} + c_{1,j} + u_{1,ij} \quad (2)$$

where $y_{1,ij}$ is the per capita consumption for household i in cluster j in the base year. Throughout this paper, subscripts 1 and 2 are used to denote the base and target surveys, respectively. $X_{1,ij}$ is a vector of (predictor) variables observed in both base and target surveys. The error term is decomposed into two components: $c_{1,j}$ capturing cluster random effects (village random effects in our context); and $u_{1,ij}$ presents household idiosyncratic errors.[6]

[5] Dang *et al.* (forthcoming) provide a recent randomization study in Tanzania that validates this imputation method. Earlier validation and application studies investigate poverty estimates for the regular populations in different contexts ranging from India, Jordan, Tunisia, to Sub-Saharan African (Beegle *et al.*, 2016; Cuesta and Ibarra, 2017; Dang and Lanjouw, 2023) and for the refugee populations in Chad, Colombia, and Jordan (Dang and Verme, 2023; Beltramo *et al.*, 2024; Sarr *et al.*, 2025).

[6] In the VHLSSs 2010-2022, the primary sampling unit (psu) is the commune. Within each selected commune, only one village is sampled. Therefore, for these survey rounds, defining clusters at the commune level is equivalent to defining them at the village level. In contrast, the 1993 and 1998 VLSSs sample two villages

We assume that conditional on the predictor variables, $c_{1,j} \sim N(0, \sigma_c^2)$ and $u_{1,ij} \sim N(0, \sigma_u^2)$, and that these error components are mutually uncorrelated. Modeling the cluster effects (c_j) allow for intra-cluster correlation and improve the precision of predicted consumption and poverty indicators (Rao and Molina, 2015; Dang *et al.*, 2019).

Equation (2) is estimated using the standard random effects model. The distributions of coefficients and the error terms are estimated and they are used to estimate per capita consumption in a target survey using a series of Monte Carlo simulations. More specifically, in each simulation *k*, we randomly draw specific values of the cluster error terms ($\hat{c}_1^k$), and household idiosyncratic errors ($\hat{u}_1^k$) from their estimated distributions to combine with the predicted coefficient ($\hat{\beta}_{1,ij}$) to estimate household consumption in the target survey. For robustness checks, we use two approaches to draw the error terms: (i) the normal linear regression method, in which the error terms are drawn from a theoretical normal distribution; and (ii) the empirical distribution method, in which the error terms are randomly drawn from the empirical distribution. We estimate household consumption in a target survey during the 1993-2008 period (e.g., the 1993 VLSS or the 2008 VHLSS) as follows

$$y_{2,ij}^k = \exp\left(X_{2,ij}\hat{\beta}_{1,ij} + \hat{c}_1^k + \hat{u}_1^k \right). \quad (3)$$

Using the imputed consumption, we estimate various well-being indicators - denoted as $\hat{P}_2^k$ - for the target survey in simulation *k*. These indicators include per capita consumption, (headcount) poverty rate, poverty gap index, the USAID poverty gap index, food poverty

within each commune. To ensure consistency across all survey years, we specify both the random effects and the clustered standard errors at the village level.

rate, and vulnerability rate. After conducting *K* simulations (e.g., K=100), the point estimates of each indicator can be obtained by computing the mean of the simulated values:

$$\hat{P}_2 = \frac{1}{K}\sum_{k=1}^{K} \hat{P}_2^k. \quad (4)$$

The standard errors of per capita consumption and poverty indexes are estimated from the sample of K simulated values.

It should be noted that the imputation method relies on two key assumptions:

- Assumption 1 (comparability of covariates): The predictor variables *X* are measured consistently across surveys and represent the same population.
- Assumption 2 (stability of returns to characteristics): Conditional on the parameters of the consumption model, changes in consumption and poverty rates between the base and target surveys are explained by changes in the predictor variables.

The first assumption requires that the predictor variables in the consumption model be comparable between the base and target surveys. A violation of this assumption can result in biased estimates of consumption and poverty in the target surveys. To satisfy this assumption, the base and target surveys should have similar sampling designs, and the predictor variables should be measured and defined in the same way across both surveys.[7] Overall, the VLSSs and VHLSSs follow a consistent sampling design, with samples that are nationally and regionally representative. The questionnaires used across these surveys are

[7] Using data from a randomized survey experiment in Malawi, Kilic and Sohnesen (2019) show that applying an identical poverty imputation model to surveys with different questionnaire lengths can lead to differences of 3 to 7 percentage points in estimated poverty rates. However, analyzing a recent randomized survey experiment in Tanzania, Dang *et al.* (2024) do not observe sensitivity of imputed poverty estimates to the differences in length and complexity between the base survey and target survey questionnaire design, provided that the identical questions are utilized across the surveys.

comparable. We select variables that are measured and defined in a consistent manner to ensure comparability over time.

The second assumption requires that changes in poverty rates and other welfare indicators of interest between surveys or over time are driven by changes in the predictor variables, rather than by changes in the returns to characteristics or unobserved error terms. This implies that the consumption model remains the same between the base and target surveys—that is, the mapping from predictor variables to consumption (i.e., the model parameters) is stable over time or across surveys.

In order to estimate per capita consumption and poverty measures for the 1993–2008 period that are comparable with those from the 2010–2022 period, we need to select an appropriate consumption model and a base survey from among the seven VHLSSs conducted between 2010 and 2022. We evaluate a range of consumption models that differ in the number and type of predictor variables and test their performance across VHLSS rounds. For example, we use the 2010 VHLSS as the base survey to impute welfare indicators for the 2012 VHLSS, and then compare the imputed estimates with the observed values in the 2012 survey. To assess the accuracy of the imputed welfare indicators, we calculate the mean absolute percentage error (MAPE) of the estimator, which is a traditional measure to assess prediction accuracy (Lewis, 1982; Hanke & Reitsch, 1995). MAPE is defined as the average absolute difference between the imputed and true values, expressed as a percentage of the true values:

$$MAPE = E\left(100 * \left|\frac{\theta - \hat{\theta}}{\theta}\right|\right) \quad (5)$$

where θ and $\hat{\theta}$ respectively denote the imputed value of a welfare indicator (e.g., per capita consumption, poverty rate) and its observed value obtained directly from the household survey. As a rule of thumb, an MAPE value below 10% is considered highly accurate, while values between 11% and 20% are considered good (Lewis, 1982).

We also apply the concept of MAPE to evaluate the differences between the standard errors obtained from the models and those estimated directly from the survey. Our goal is to select a model that yields lower MAPE values for both the point estimates and their associated standard errors. One limitation of MAPE is that when the actual values are close to zero, it can have extremely large values, making interpretation difficult and potentially dominating the average error. This issue is particularly relevant for the standard error estimates of poverty rates. Thus, the interpretation of MAPE for standard errors should be made with caution.

We do not report the Mean Squared Error (MSE), as our objective is to compare estimation errors across different estimates of per capita consumption and poverty indicators. A consumption model may yield more accurate estimates of per capita consumption than another model, yet produce less accurate estimates of poverty measures. To select a model or base survey that performs well across all indicators, we rely on MAPE instead of MSE, since the indicators vary in scale and units. For each consumption model or base survey, we calculate Absolute Percentage Errors (APE) for all poverty indicators and then compute the average of these APEs to get MAPE. If the goal is to identify a model or base survey that provides the highest overall accuracy, we select the one with the lowest MAPE. However, if we are interested in only one specific indicator—such as per capita consumption or the

poverty rate—we choose the model or base survey that minimizes the MAPE for that particular indicator.

We use the Stata package "s2s" to obtain the imputed estimates (Dang *et al.*, 2025b). The point estimates as well as standard errors are estimated using 100 bootstrap replications and adjusted for complex survey design and sampling weights.

4. Estimation results

4.1. Model variable selection

The first step in survey-to-survey imputation is to select the (predictor) variables in the consumption regression model. Following previous studies (e.g., Dang *et al.*, 2017, 2024, 2025c) and based on data availability in this study, our variables are grouped as follows:

- household (heads') demographic characteristics: age, gender, and education achievement, household size, and the dependency ratio.
- household (heads') employment characteristics: employment status and types of occupation.
- asset ownership and housing conditions: ownership of durable goods, dwelling types (permanent and semi- permanent), and access to sanitation and clean water.
- utility and partial consumption aggregates: consumptions on electricity, water, garbage collection, health, and education.
- community-level and geospatial variables: infrastructure of communes and night-time light intensity.

We also consider the variables that meet the following criteria:

- available in both the base and target surveys
- defined and measured in a comparable way, and
- sufficiently correlated with household consumption.

After carefully reviewing the questionnaires and examining the data, we selected 49 household-level variables, including six regional dummy variables and two additional dummy variables indicating whether the household is located in Hanoi or Ho Chi Minh City—the two largest cities in Viet Nam. In addition, we identified five village-level variables that capture infrastructure characteristics of villages: the availability of a road, a high-quality road, a post office, a periodic market, and the distance to the nearest town.[8] Finally, at the district level, we include a variable measuring nighttime light intensity as a proxy for local economic activity. Thus, the total number of potential variables is 55. Tables A.2 to A.5 in the Appendix present the means of all available variables that can be used to estimate the consumption models.

Ensuring the comparability of variables across surveys is essential to satisfy the first assumption of the proposed imputation method. This assumption is generally untestable in the absence of an external benchmark survey. Therefore, we aim to select variables that are measured consistently over time. Binary variables such as those indicating education levels, age groups, or ownership of durable goods are typically less prone to measurement error. In contrast, variables related to spending on utilities and health services are more susceptible to such errors and require the appropriate deflators. However, consumption components often

[8] The VHLSS collects commune-level data only for rural communes. Therefore, we assume that these infrastructure variables take a value of 1 for all urban communes—i.e., we assume that all urban communes have roads, post offices, and markets. We also assume that the distance to the nearest town is zero for urban areas.

have strong predictive power for household consumption (Dang *et al.*, 2025c) and are therefore considered in the model despite their potential for measurement inconsistencies.

4.2. Construction of imputation models

We begin by estimating the log of per capita consumption using all available predictor variables for each survey year. The full model is estimated separately for every household survey. According to the second assumption of the proposed imputation method, the coefficients of predictor variables should remain stable across surveys. In particular, these variables should exhibit consistent signs over time and have economically meaningful interpretations. For instance, dummy variables such as ownership of a color television and indicators for residence in Hanoi and Ho Chi Minh City are positive and statistically significant in several years but turn negative and significant in others. We exclude variables that do not have the expected sign or exhibit sign reversals across survey years, as these patterns suggest a lack of stability and economic interpretability.

After excluding several predictor variables with inconsistent signs, we developed Model 1, which includes variables related to demographics, asset ownership (durables), housing conditions, consumption components, regional and city dummy variables, as well as village- and district-level characteristics. This model still retains several predictor variables that are not statistically significant in all survey rounds but exhibit consistent signs across surveys, indicating potential predictive value.

In Model 2, we further refine the specification by excluding regional dummy variables, village-level variables, and variables that are statistically insignificant in multiple survey rounds. As previously noted, consumption components—such as spending on

utilities, health, and education—are more prone to measurement errors. Therefore, in Model 3, we exclude these consumption components from the set of predictor variables.

In Model 4, we additionally remove the nighttime light variable, and in Model 5, we exclude variables measuring housing conditions. This final model includes only demographic characteristics and asset ownership variables (durables), which are generally the least susceptible to measurement errors and are consistently measured across surveys. These variables also represent the core set of predictor variables that perform reasonably well in various countries, including Viet Nam (Dang *et al.*, 2024 and 2025c).

The regression results from the five models are presented in Tables A.6 to A.10 in the Appendix. The R-squared values decrease progressively from Model 1 to Model 5. In Model 1, the R-squared ranges from 0.62 for the 1993 VLSS to 0.77 for the 1998 VLSS. Model 2 yields slightly lower R-squared values, but the reduction compared to Model 1 is relatively small. In Model 5, the R-squared values range from 0.40 for the 1993 VLSS to 0.64 for the 2010 VHLSS.

The predictor variables used in Models 1 to 5 are selected based on economic theory and insights from previous studies. For additional robustness checks, we also adopt a data-driven approach to variable selection. Specifically, we employ machine learning methods, including LASSO, Rigorous LASSO, and Elastic Net, to identify relevant predictor variables. A key feature of these methods is the division of the dataset into a training sample and a validation (or estimation) sample. The training sample is used to estimate the consumption model, which is subsequently applied to the validation sample to compute the squared (prediction) errors by comparing the predicted and actual values. These methods select models that minimize the squared errors while simultaneously reducing the risk of

overfitting. Finally, we also apply traditional variable selection techniques, including forward stepwise and backward stepwise regression, with the significance level set at 0.05. Tables A.11 to A.15 present the results from random-effects regressions using variables selected through these methods.

Note that several predictor variables used in the imputation models—such as consumption components, education, and employment status—are potentially endogenous. In the context of survey-to-survey imputation, endogeneity is less problematic because the primary objective is not to identify the causal effect of these variables on consumption. Instead, our goal is to obtain accurate estimates of household consumption. As long as the variables are strong predictors and consistently measured across surveys, they can still be effectively used in the imputation model, even if they are endogenous.

To evaluate the accuracy of different models, we apply each model estimated from a base survey—such as the 2010 VHLSS—to all the other VHLSS rounds and calculate the MAPEs for each model across all base-target survey pairs. Tables A.16 to A.57 in the Appendix present the imputation results, where each different base survey is employed to impute, including VHLSS 2010 to 2022 and using Models 1 through 5. For each model, we report both the observed (true) and imputed values of per capita consumption and poverty measures. We implement two approaches to estimate the error terms: the normal linear regression method (presented in Panel A of each table) and the empirical distribution method (Panel B). In addition, we compute and report the MAPEs of both the mean and standard errors for each model.

The results indicate that Models 1 and 2 consistently yield the lowest MAPEs, while Model 5 produces the highest. This suggests that models with higher R-squared values tend

to provide higher prediction accuracy. Based on these findings, we select Model 2 as the preferred specification for interpretation. Model 2 achieves the MAPEs comparable to those of Model 1, but Model 2 uses fewer unstable predictor variables.

The next step is to select an appropriate base survey from among the VHLSS rounds conducted between 2010 and 2022. In Table 2, we compare the MAPE in estimating both the point estimates and standard errors using different VHLSS surveys as the base survey. For each base survey, we impute per capita consumption and poverty indicators for the remaining VHLSS rounds and compute the MAPEs across all target surveys. It should be noted that the figures in parentheses are not standard errors themselves, but rather the MAPE of the standard errors—specifically, the relative difference between the standard errors of the imputed estimates and those of the direct estimates. The last two rows of the table present the MAPEs across columns. A higher MAPE of the standard errors suggests that the imputation model yields less precise estimates, as indicated by larger standard errors compared to those derived directly from the survey data.

The results indicate that using the 2016 VHLSS as the base survey yields the lowest MAPEs across other survey years, suggesting that it provides the most accurate and stable imputations. In contrast, using the 2022 VHLSS as the base survey results in the highest MAPEs. The coefficients of the predictor variables in the 2022 VHLSS show more differences from those in other VHLSS rounds, which suggests potentially negative changes in household behavior and consumption patterns during the pandemic period and concurs with previous studies (Bui *et al.*, 2022; Dang *et al.*, 2023).

We also replicate the analysis using five alternative models in which the predictor variables are selected through machine learning techniques and stepwise regression methods.

To save space, we do not present the full results for these models in this paper. Appendix Tables A.58 to A.63 present only results of the imputation from the 2016 VHLSS as the base survey to other VHLSSs using the LASSO model. Overall, the five models produce imputed estimates of per capita consumption and poverty measures that are quite similar to those from our main models. On average, the MAPEs from these alternative models are also very similar. For illustration, Table 3 presents a summary comparison in which the 2016 VHLSS is used as the base survey to impute per capita consumption and poverty indicators for the other VHLSS rounds from 2010 to 2022. The table compares the MAPEs of Model 2 with those of the five data-driven models across multiple welfare indicators. The results show that Model 2 yields lower MAPEs than those of the alternative data-driven models, indicating its higher accuracy.

Table 4 presents the true values of per capita consumption and poverty indicators estimated directly from the VHLSS rounds from 2010 to 2022, together with the imputed estimates using the 2016 VHLSS and Model 2. We show in bold the estimates that fall within the 95% confidence intervals (CIs) of the true rates. There are 72 estimates in total, of which 44 (60%) fall within the 95% CIs. Overall, the imputed estimates closely align with the true estimates. Specifically, 58 estimates (79%) have an APE below 10%, and most of the remaining estimates have an APE below 20%. Only two estimates have the highest APE of 21%. According to Lewis (1982), an APE below 10% indicates a highly accurate prediction, while an APE between 11% and 20% is considered good.

Next, we examine survey-to-survey imputation for the 1993–2008 period by replicating the analysis conducted for the 2010–2022 VHLSS rounds. Table 5 presents the MAPEs of the estimates when using different surveys as the base survey (similar to Table 2).

The results show that using the 2002 VHLSS or the 2004 VHLSS as the base survey yields the lowest MAPEs, whereas using the 2008 VHLSS results in the highest MAPE.

Table 6 compares the prediction accuracy of different models when imputing for per capita consumption and poverty indicators using the 2004 VHLSS as the base survey. Although the 2002 VHLSS yields slightly lower MAPEs than the 2004 VHLSS does, we choose the 2004 VHLSS as the base survey due to its sample size being more consistent with the other surveys (the 2002 VHLSS has a sample size more than three times larger than those of other survey rounds). Once again, Model 2 has the lowest MAPEs, indicating higher prediction accuracy than the alternative data-driven models.

Table 7 presents the observed (true) values of per capita consumption and poverty indicators estimated directly from the VLSS and VHLSS surveys conducted between 1993 and 2008, and the corresponding values imputed using the 2004 VHLSS and Consumption Model 2. Estimates falling within the 95% CI of the true rates are shown in bold. In this table, there are 60 estimates, of which 29 estimates (48%) fall into the 95 confidence intervals. There are 47 estimates (78%) having the absolute percentage errors less than 10%. Except for 2008, the imputed values are similar to the true values. For this year, the imputed per capita consumption is higher than the survey-based estimate, while the imputed poverty and vulnerability rates are also higher than those estimated directly from the survey. One possible explanation is that Vietnam's economy was affected by the global financial crisis, which led to lower income growth compared to other years, and consequently the model did not fit the actual consumption well in this year.[9]

[9] Viet Nam's GDP growth rate was 7.5% in 2005, 7.0% in 2006, 7.1% in 2007, before decreasing to 5.7% in 2008 and 5.4% in 2009 (World Bank, 2025).

4.3. Time-consistent estimates

To construct time-consistent estimates of welfare indicators, we use Model 2 and the 2016 VHLSS as the base survey to impute welfare indicators for the VLSS and VHLSS rounds conducted between 1993 and 2008. Table 8 presents the imputed estimates of per capita consumption and poverty indicators for this period. The results show a steady increase in per capita consumption over time, accompanied by significant declines in the poverty headcount rate, poverty gap, and food poverty rate. For example, the poverty rate decreases from 78.4% in 1993 to 22.9% in 2008 (Panel A). Compared to the direct estimates, the imputed per capita consumption and poverty rates are generally higher, reflecting consistency with the 2010–2022 estimates. Similarly, Table 9 presents results using the 2004 VHLSS as the base survey to impute welfare indicators for the 2010 to 2022 VHLSS rounds.

Figure 3 presents time-consistent estimates of per capita consumption and poverty rates. Panel A shows per capita consumption at 2022 prices, along with 95% confidence intervals. In the blue line, per capita consumption for the 1993–2008 period is imputed using the 2016 VHLSS (as the base survey) and the corresponding surveys (as the target surveys), while the estimates for the 2010–2022 period are derived directly from the respective surveys. We also show the estimates using the 2004 VHLSS as an alternative base year. The brown line reflects per capita consumption estimates obtained directly from the 1993–2008 surveys and imputed estimates for the 2010–2022 period, using the 2004 VHLSS as the base survey. Panel B displays poverty rates with 95% confidence intervals. In the blue line, poverty rates for 1993–2008 are imputed using the 2016 VHLSS, while those for 2010–2022

are directly estimated. Conversely, the brown line presents directly estimated poverty rates for 1993–2008 and imputed rates for 2010–2022, using the 2004 VHLSS as the base survey.

Some remarks are in order. First, Figure 3 shows a consistent increase in per capita consumption and a steady decline in the poverty rate over time. Interestingly, unlike Figures 1 and 2, it shows smoother trends and does not display the discontinuities in per capita consumption and poverty rates between 2008 and 2010. Second, the blue line unsurprisingly shows larger consumption levels and poverty rates than those of the brown line, indicating that the imputed estimates using 2016 as the base survey are consistent with higher income levels and living standards in 2016, compared to those using 2004 as the base survey. Our preferred base year is 2016, which provides more recent data that better reflects current living standards. Yet, using 2004 as the base year could also be useful in contexts where there is a stronger focus on producing imputed estimates that are consistent with historical time series and that could better reflect different (and oftentimes lower) living standards in the past.

Finally, when the 2004 VHLSS is used as the base survey to impute per capita consumption and poverty for the 2010–2022 period, the model fails to capture the decline in per capita consumption and the rise in the poverty rate observed in 2022. This finding suggests caution when imputing welfare indicators for years affected by abnormal shocks, such as the COVID-19 pandemic.

4.4. Robustness checks

In this study, we conduct several robustness checks to examine the sensitivity of the imputed values. First, as shown in all tables, the two methods used to draw error terms—the normal

linear regression method and the empirical distribution method—produce similar point estimates and standard errors.

Second, we find that for a given period, multiple surveys can be used as base years, yielding similar imputed estimates for other surveys. In the main analysis, we use the 2016 VHLSS as the base survey to impute welfare indicators for the 1993–2008 period. As a robustness check, Tables A.64 and A.65 in the Appendix present results using the 2012 VHLSS and the 2020 VHLSS as alternative base surveys. Conversely, we also use the 2002 VHLSS and the 2006 VHLSS to impute welfare indicators for the 2010–2022 period.

Third, we assess the sensitivity of the results to the choice of the imputation model. The data-driven models produce imputed values and MAPEs that are very similar to those generated by Model 2. Tables A.68 to A.71 in the Appendix present imputation results using variable selection via LASSO. Overall, the imputation results obtained from the LASSO-selected models closely align with those from Model 2.

5. Further extension

We next apply the imputation method to estimate per capita consumption and poverty rates for various population subgroups, including urban and rural households, Kinh majority group and ethnic minority groups, and the six geographic regions. We use the 2016 VHLSS as the base survey and use Model 2 to impute per capita consumption for the 1993 VLSS through the 2008 VHLSS (the normal linear regression method). Based on the imputed consumption, we estimate poverty indicators for each of these population subgroups.

Panel A of Figure 4 presents per capita consumption for urban and rural areas, estimated directly from the corresponding surveys (at 2022 prices). The figure shows a clear

break in per capita consumption between 2008 and 2010 for both urban and rural households. In contrast, Panel B uses imputed values to provide time-consistent estimates of per capita consumption, smoothing out the discontinuity observed in the direct estimates. A similar pattern is observed for the ethnic Kinh and minority groups, where a noticeable discontinuity occurs between 2008 and 2010 in the direct estimates. The imputed values produce a more consistent trend in per capita consumption for both groups over time. The absolute gap in per capita consumption between urban and rural population as well as between Kinh and ethnic minorities tend to widen over time.

Similarly, Figure 5 shows that the imputed poverty rates exhibit higher consistency across years for different population groups. While the gap in poverty rates between urban and rural populations tends to narrow over time, the disparity between the ethnic Kinh and minority groups remains largely unchanged. Although both groups have experienced poverty reduction, the relative difference in poverty rates between them has increased significantly. For example, in 2022, the poverty rate among ethnic minorities is 37%, nearly 20 times higher than the rate of 1.9% observed among the Kinh population.

Finally, Table 10 presents time-consistent estimates of per capita consumption (at 2022 prices) and poverty headcount rates across six major regions of Viet Nam from 1993 to 2022. Panel A shows that per capita consumption has increased steadily over time in all regions. The Southeast region consistently reports the highest per capita consumption, rising from 16,116 thousand VND in 1993 to 70,383 thousand VND in 2020 before being heavily affected by the COVID-19 pandemic. In contrast, the Northern Midlands and Mountain Areas and the Central Highlands remain the poorest regions, though they have also experienced growth in consumption over time. Panel B presents poverty headcount rates,

which have declined significantly in all regions. For instance, in the Red River Delta, the poverty rate dropped from 63.5% in 1993 to just 0.4% in 2022. The poorest regions, the Northern Midlands and Mountain Areas and Central Highlands, also experienced large poverty reduction over time.

6. Conclusion

In this study, we examine and address the challenge of constructing time-consistent welfare measures in the context of changes in survey design and poverty measurement methodologies over time. In the case of Viet Nam, estimates of aggregate consumption and poverty indicators exhibit a discontinuity between 2008 and 2010, when NSO and the World Bank revised the methodology for calculating the consumption aggregate and the poverty line. Using the 2016 VHLSS as the preferred base survey, we produce time-consistent estimates of welfare indicators for the 1993–2008 period. Using the 2004 VHLSS as an alternative base survey provides lower estimated living standards and poverty levels. The resulting imputed values provide time-consistent estimates of per capita consumption and poverty indicators over the past three decades from 1993 to 2022.

In addition to generating a time-consistent poverty series for Viet Nam, this study offers practical guidance on model selection and base survey choice in the context of survey-to-survey imputation. We compare several model specifications and assess their prediction accuracy, showing that a relatively large consumption model—constructed based on economic theory—outperforms models with fewer predictor variables as well as those based on data-driven approaches. Selection of an appropriate base survey is also crucial. An appropriate base survey should produce stable estimates for the consumption model and

closely resemble the consumption models of the target surveys. Overall, our findings demonstrate the feasibility of imputing welfare indicators over an extended time period—an area that has received limited attention in the existing literature.

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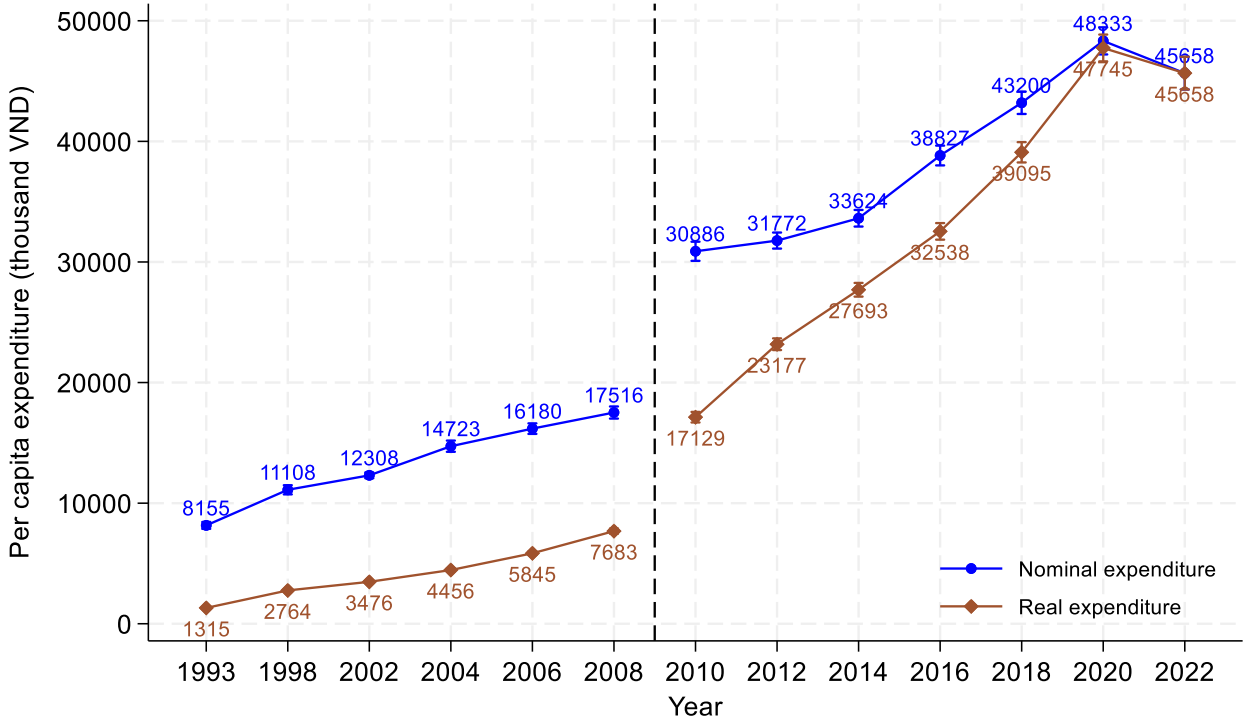
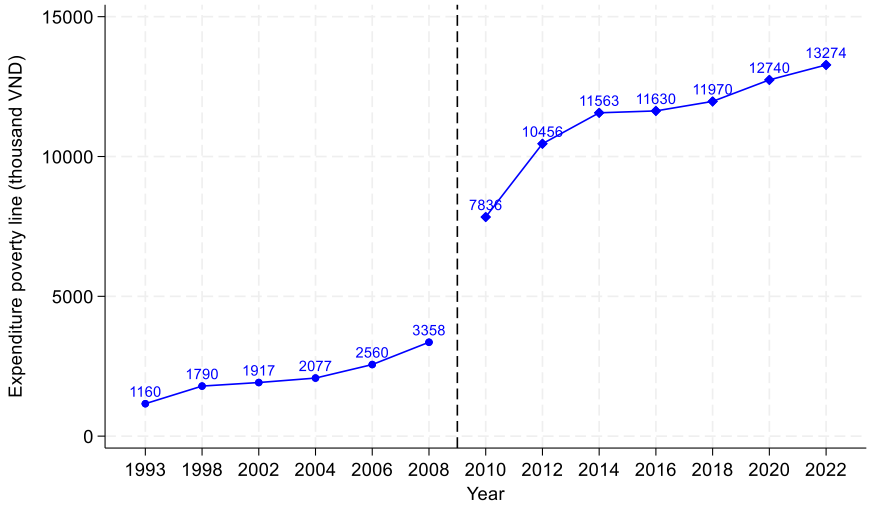
Figure 1. Per capita consumption at nominal and constant 2022 prices



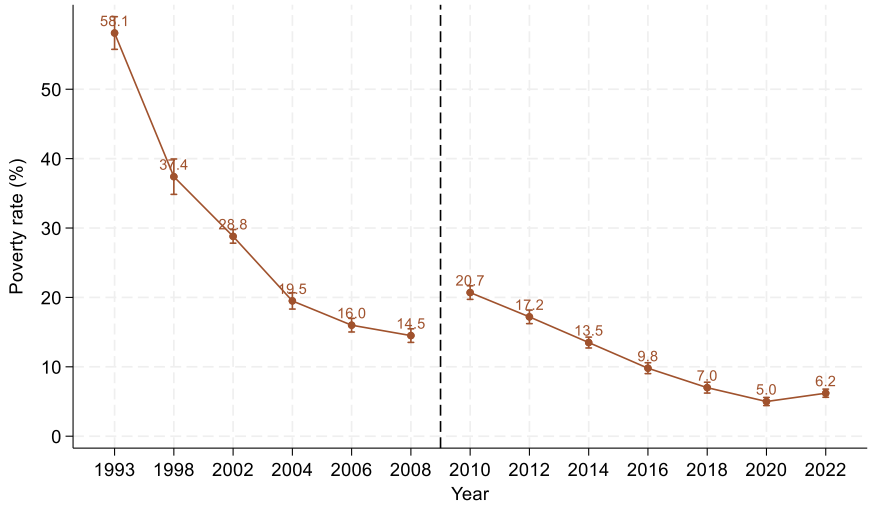
Note: This figure presents per capita consumption at the current and constant (2022) prices (adjusted by overall CPI) and the 95% confidence intervals. The dashed vertical line between 2008 and 2010 indicates that the observed V(H)LSS data for the period 1993-2008 and 2010-2022 are not comparable.
Source: Estimations from VLSS and VHLS data.

Figure 2. Consumption poverty line and poverty headcount rates

A. Consumption poverty line (thousand VND)



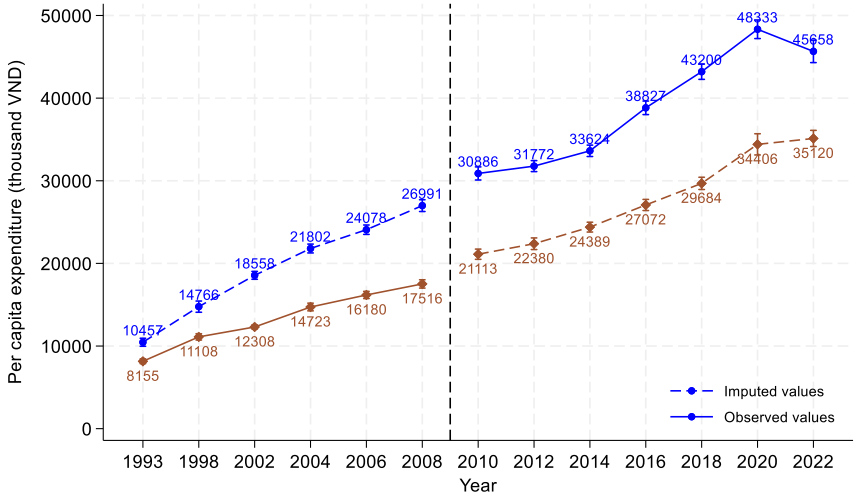
B. Poverty rates (%)



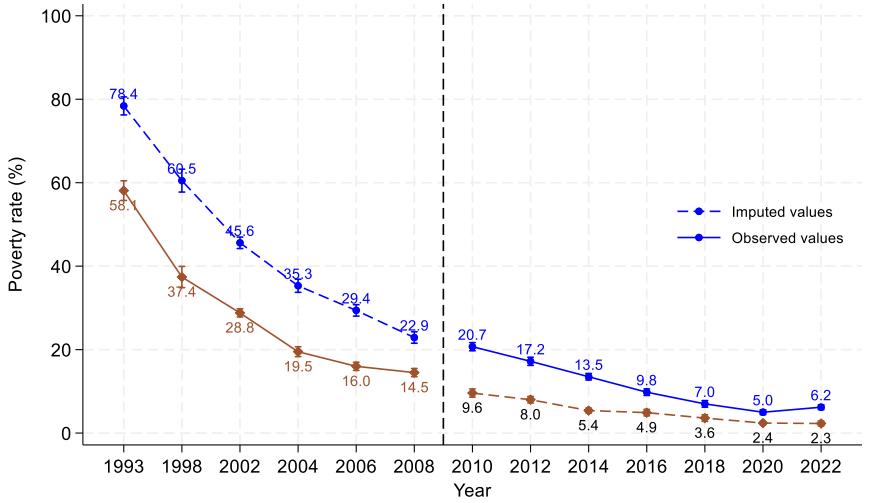
Note: Panel A of this figure presents consumption poverty lines. Panel B graphs the poverty headcount rate (percent) and the 95% confidence intervals, which are estimated using per capita consumption and consumption poverty lines constructed by NSO and WB. The dashed vertical line between 2008 and 2010 indicates that the observed V(H)LSS data for the period 1993-2008 and 2010-2022 are not comparable.
Source: Estimations from VLSS and VHLS data.

Figure 3. Time-consistent per capita consumption (million VND) and poverty headcount rate (%)

A. Per capita consumption (million VND, at the 2022 price)



B. Poverty rates (%)



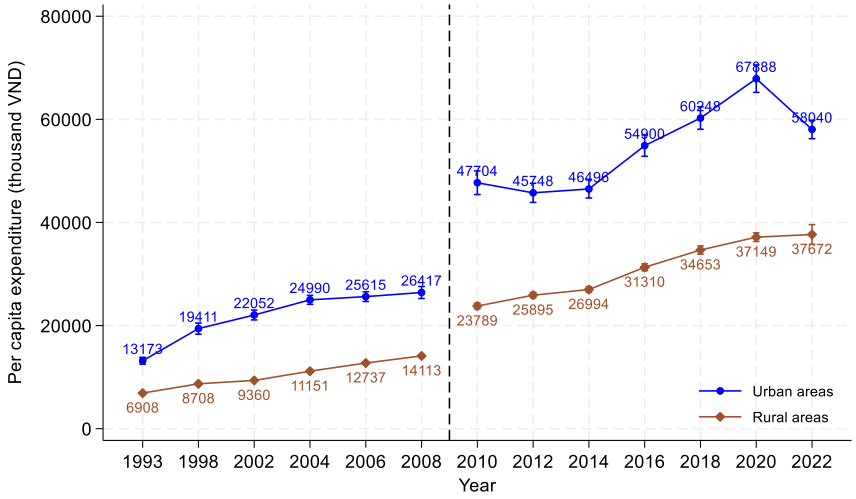
Note: Panel A of this figure presents per capita consumption at 2022 prices with 95% confidence intervals. In the blue line, per capita consumption for the 1993–2008 period is imputed using the 2016 VHLSS (as the base survey) and the corresponding surveys (as the target surveys), while per capita consumption for the 2010–2022 period is estimated directly from the corresponding surveys. In the brown line, per capita consumption for the 1993–2008 period is estimated directly from the corresponding surveys, while for the 2010–2022 period it is imputed using the 2004 VHLSS and the corresponding surveys.

Panel B graphs poverty rates with 95% confidence intervals. In the blue line, the poverty rates for the 1993–2008 period are imputed using the 2016 VHLSS (as the base survey) and the corresponding surveys (as the target surveys), while the poverty rates for the 2010–2022 period are estimated directly from the corresponding surveys. In the brown line, the poverty rates for the 1993–2008 period are estimated directly from the corresponding surveys, while for the 2010–2022 period they are imputed using the 2004 VHLSS and the corresponding surveys. The dashed vertical line between 2008 and 2010 indicates that the observed V(H)LSS data for the period 1993-2008 and 2010-2022 are not comparable.

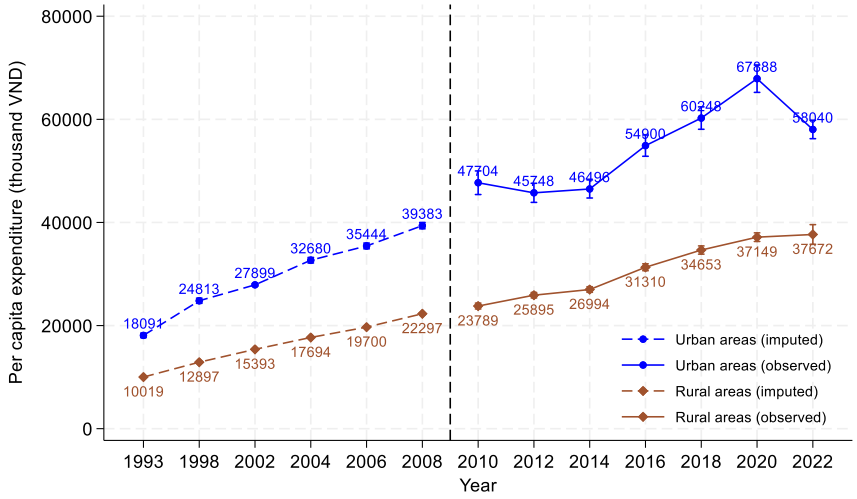
Source: Estimations from VLSS and VHLS data.

Figure 4. Per capita consumption (million VND) of population subgroups

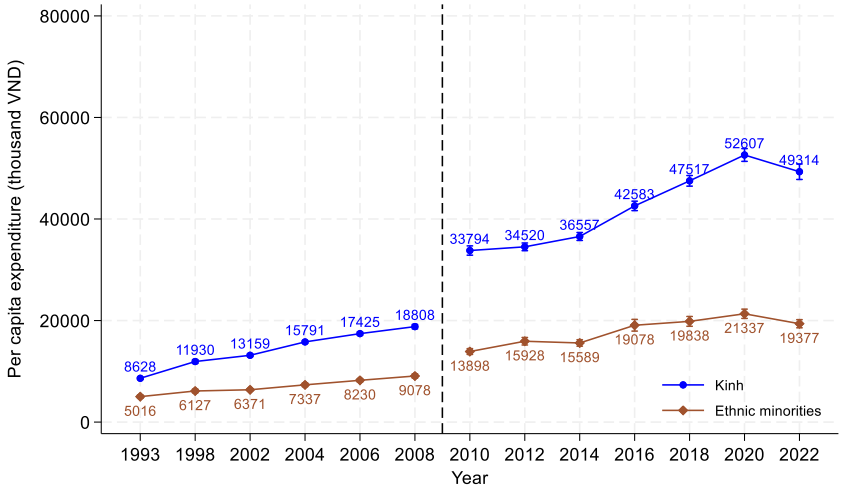
A. Observed per capita consumption of urban and rural areas



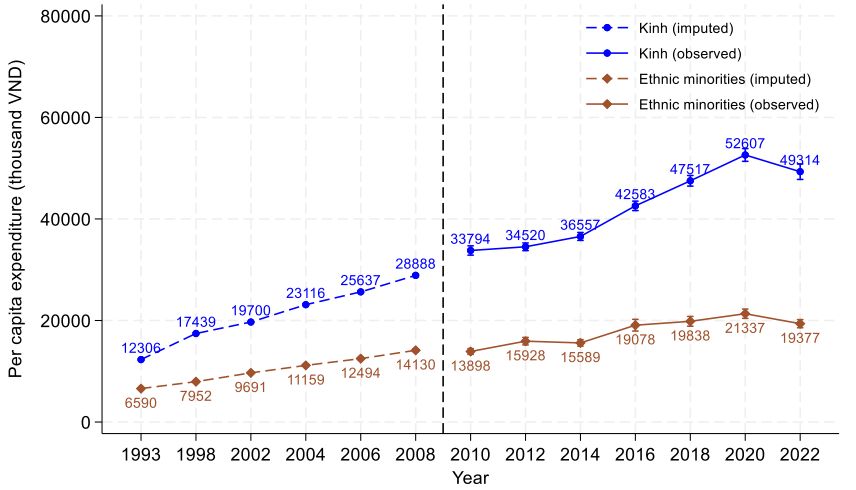
B. Time-consistent per capita consumption of urban and rural areas



C. Observed per capita consumption of ethnic minorities and Kinh



D. Time-consistent per capita consumption of ethnic minorities and Kinh

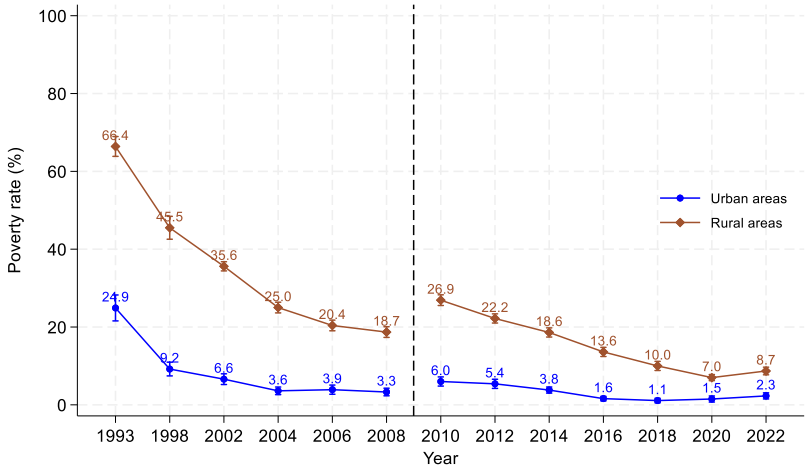


Note: Panel A and C present per capita consumption with 95% confidence intervals of population subgroups, which are estimated directly from the surveys. Panel B and D present time-consistent per capita consumption with 95% confidence intervals of population subgroups. In these panels, per capita consumption for the 1993–2008 period is imputed using the 2016 VHLSS (as the base survey) and the corresponding surveys (as the target surveys), while per capita consumption for the 2010–

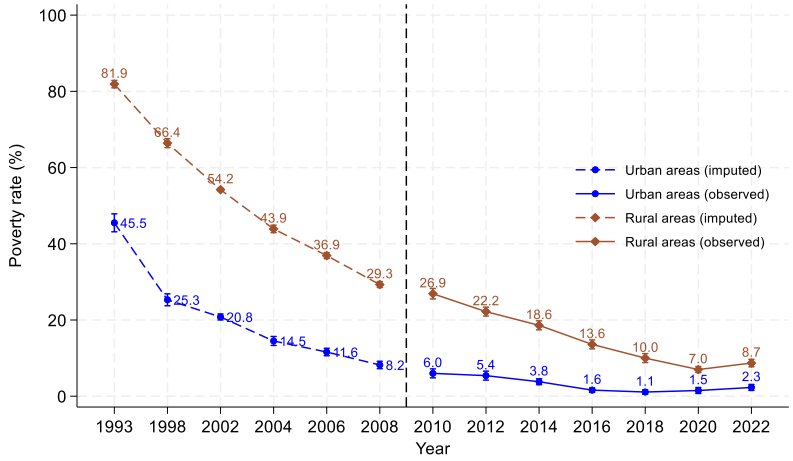
2022 period is estimated directly from the corresponding surveys. The dashed vertical line between 2008 and 2010 indicates that the observed V(H)LSS data for the period 1993-2008 and 2010-2022 are not comparable.

Figure 5. Poverty headcount rates (%) of population subgroups

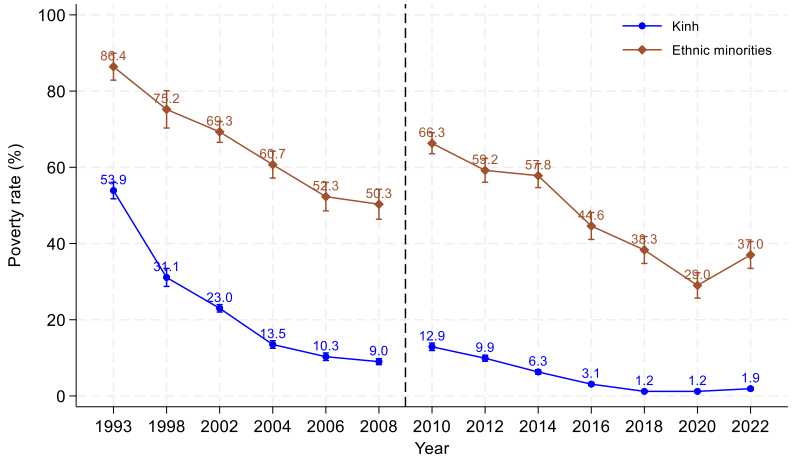
A. Observed poverty rates of urban and rural areas



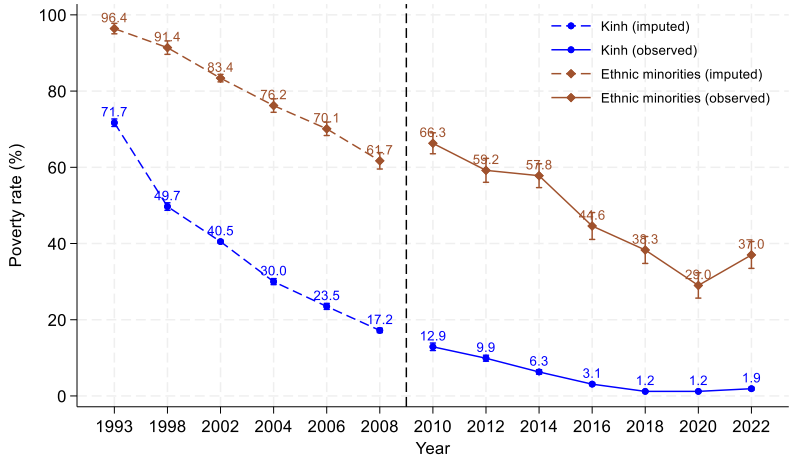
B. Time-consistent poverty rates of urban and rural areas



C. Observed poverty rates of ethnic minorities and Kinh



D. Time-consistent poverty rates of ethnic minorities and Kinh



Note: Panel A and C present poverty rates with 95% confidence intervals of population subgroups, which are estimated directly from the surveys. Panel B and D present time-consistent poverty rates with 95% confidence intervals of population subgroups. In these panels, poverty rates for the 1993–2008 period are imputed using the 2016 VHLSS (as the base survey) and the corresponding surveys (as the target surveys), while poverty rates for the 2010–2022 period are estimated directly from the corresponding surveys. The dashed vertical line between 2008 and 2010 indicates that the observed V(H)LSS data for the period 1993-2008 and 2010-2022 are not comparable.

Table 1. Per capita consumption and poverty measurements

Variables	VLSS 1993	VLSS 1998	VHLSS 2002	VHLSS 2004	VHLSS 2006	VHLSS 2008	VHLSS 2010	VHLSS 2012	VHLSS 2014	VHLSS 2016	VHLSS 2018	VHLSS 2020	VHLSS 2022
Nominal per capita consumption (thousand VND, current price)	8155.3	11108.4	12307.9	14722.9	16180.3	17515.7	30886.1	31772.4	33623.8	38827.2	43200.0	48333.3	45657.9
	(117.2)	(175.5)	(126.0)	(135.5)	(154.0)	(197.1)	(404.5)	(340.0)	(351.8)	(418.4)	(474.4)	(573.3)	(693.8)
Real per capita consumption (thousand VND, the 2022 price)	1314.9	2763.8	3476.1	4456.5	5844.9	7683.1	17129.0	23177.4	27693.2	32537.9	39094.9	47744.8	45657.9
	(18.9)	(43.7)	(35.6)	(41.0)	(55.6)	(86.5)	(224.3)	(248.0)	(289.8)	(350.7)	(429.3)	(566.3)	(693.8)
Poverty headcount rate (percent)	58.1	37.4	28.8	19.5	16.0	14.5	20.7	17.2	13.5	9.8	7.0	5.0	6.2
	(1.1)	(1.2)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.4)	(0.4)	(0.4)	(0.3)	(0.3)
Poverty gap (percent)	18.5	9.5	6.9	4.7	3.8	3.5	5.9	4.5	3.7	2.6	2.0	1.2	1.6
	(0.6)	(0.5)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.1)	(0.1)	(0.1)
USAID poverty gap (percent)	31.8	25.5	24.1	24.2	24.0	24.0	28.4	26.0	27.6	26.5	28.1	24.7	26.0
	(0.6)	(0.7)	(0.3)	(0.5)	(0.6)	(0.6)	(0.5)	(0.5)	(0.6)	(0.8)	(1.0)	(0.9)	(1.1)
Food poverty headcount rate (percent)	30.8	13.8	9.7	6.7	5.4	4.6	8.9	6.4	5.5	3.8	3.2	1.7	2.4
	(1.1)	(1.0)	(0.4)	(0.3)	(0.3)	(0.3)	(0.4)	(0.3)	(0.3)	(0.3)	(0.3)	(0.2)	(0.2)
Vulnerability rate (percent)	15.6	19.3	19.1	15.9	13.6	14.7	14.9	13.4	11.0	8.5	6.6	5.3	5.3
	(0.6)	(0.7)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.3)	(0.3)

Note: Point estimates and standard errors are adjusted for complex survey designs. Standard errors of the means are in parentheses.

Table 2. MAPE in imputing welfare indicators for the 2010-2022 period using different VHLSS rounds as base surveys

Welfare indicators	Base surveys						
	VHLSS 2010	VHLSS 2012	VHLSS 2014	VHLSS 2016	VHLSS 2018	VHLSS 2020	VHLSS 2022
Panel A. Normal linear regression method							
Per capita consumption (thousand VND)	4.7	3.2	4.5	2.8	4.8	3.0	7.8
	(44.7)	(19.8)	(30.9)	(14.6)	(54.5)	(11.8)	(11.8)
Poverty headcount rate (percent)	16.1	11.9	23.5	9.8	10.3	8.9	24.4
	(32.5)	(27.0)	(34.7)	(27.0)	(25.4)	(31.2)	(35.2)
Poverty gap (percent)	17.5	12.2	25.8	10.4	12.2	10.6	31.8
	(44.3)	(32.6)	(51.6)	(46.1)	(43.1)	(50.6)	(59.4)
USAID poverty gap (percent)	3.6	5.5	3.8	3.6	6.0	7.4	6.1
	(21.9)	(19.7)	(22.4)	(45.9)	(39.7)	(54.9)	(37.0)
Food poverty headcount rate (percent)	16.7	11.5	23.9	10.6	11.6	9.7	30.1
	(33.0)	(23.3)	(37.9)	(30.5)	(29.5)	(33.8)	(40.9)
Vulnerability rate (percent)	9.4	11.1	14.5	6.7	9.8	11.0	11.1
	(9.8)	(10.0)	(10.7)	(7.5)	(7.5)	(5.3)	(5.6)
Panel B. Empirical distribution method							
Per capita consumption (thousand VND)	4.8	3.1	4.2	2.8	5.1	2.7	6.6
	(40.1)	(21.3)	(32.4)	(15.6)	(50.7)	(15.6)	(31.6)
Poverty headcount rate (percent)	14.3	11.6	21.9	9.5	9.8	8.8	21.7
	(31.9)	(29.5)	(35.5)	(26.5)	(24.1)	(34.0)	(36.8)
Poverty gap (percent)	15.7	11.3	22.7	9.4	11.0	10.2	28.2
	(41.9)	(30.2)	(50.0)	(36.5)	(37.9)	(67.4)	(62.4)
USAID poverty gap (percent)	3.4	6.4	3.4	4.1	4.9	7.1	5.3
	(23.1)	(19.7)	(23.8)	(37.0)	(35.6)	(80.0)	(39.0)
Food poverty headcount rate (percent)	14.6	11.1	20.6	10.3	10.2	9.1	26.0
	(31.6)	(22.5)	(37.5)	(25.8)	(25.8)	(45.9)	(44.3)
Vulnerability rate (percent)	9.1	11.2	14.4	6.1	9.0	10.8	10.5
	(10.6)	(12.3)	(11.5)	(9.3)	(6.9)	(4.7)	(9.0)
MAPE of means	10.8	9.2	15.3	7.2	8.7	8.3	17.5
MAPE of standard errors	(30.4)	(22.3)	(31.6)	(26.9)	(31.7)	(36.3)	(34.4)

Note: This table reports the MAPE of both the point estimates and the standard errors of the imputed estimates, using different VHLSS rounds as the base surveys to impute welfare indicators for the remaining VHLSS rounds. The MAPEs of the estimated standard errors are reported in parentheses. Model 2 is used for imputation in all the VHLSSs.

Table 3. MAPE in imputing welfare indicators for the 2010-2022 period using different models and the 2016 VHLSS as the base survey

Welfare indicators	Estimation models					
	Base model (Model 2)	Lasso regression	Rigorous lasso	Elastic net	Forward stepwise	Backward stepwise
Panel A. Normal linear regression method						
Per capita consumption (thousand VND)	2.8	3.0	2.9	3.0	3.0	3.0
	(14.7)	(17.1)	(16.0)	(17.1)	(16.3)	(16.9)
Poverty headcount rate (percent)	9.7	9.2	9.6	9.2	9.3	9.3
	(27.0)	(29.4)	(30.1)	(29.4)	(29.0)	(29.3)
Poverty gap (percent)	10.1	13.0	13.2	13.0	12.7	12.9
	(46.1)	(55.5)	(57.7)	(55.5)	(55.1)	(55.2)
USAID poverty gap (percent)	3.6	6.3	6.3	6.3	6.5	6.3
	(45.9)	(51.3)	(54.8)	(51.3)	(51.9)	(51.3)
Food poverty headcount rate (percent)	10.3	12.0	12.2	12.0	11.6	11.9
	(30.6)	(37.0)	(38.2)	(37.0)	(36.6)	(36.7)
Vulnerability rate (percent)	6.7	8.4	8.1	8.4	8.4	8.2
	(7.5)	(6.4)	(6.4)	(6.4)	(6.4)	(6.5)
Panel B. Empirical distribution method						
Per capita consumption (thousand VND)	2.8	3.2	3.1	3.2	3.2	3.2
	(15.4)	(25.1)	(24.8)	(25.1)	(24.1)	(25.0)
Poverty headcount rate (percent)	9.5	8.9	9.1	8.9	9.0	9.0
	(26.6)	(29.0)	(30.4)	(29.0)	(28.5)	(29.0)
Poverty gap (percent)	9.5	11.5	11.6	11.5	11.5	11.5
	(36.4)	(47.6)	(50.5)	(47.6)	(47.1)	(47.4)
USAID poverty gap (percent)	3.9	5.7	5.6	5.7	5.9	5.7
	(36.7)	(47.9)	(50.7)	(47.9)	(47.9)	(47.3)
Food poverty headcount rate (percent)	10.3	10.4	10.8	10.4	10.2	10.4
	(25.5)	(33.3)	(35.3)	(33.3)	(32.8)	(33.2)
Vulnerability rate (percent)	5.6	7.7	7.4	7.7	8.0	7.6
	(9.2)	(7.3)	(7.9)	(7.3)	(7.5)	(7.6)
MAPE of means	7.1	8.3	8.3	8.3	8.3	8.3
MAPE of standard errors	(26.8)	(32.2)	(33.6)	(32.2)	(31.9)	(32.1)

Note: This table reports the MAPE of both the point estimates and the standard errors of the imputed estimates in different prediction models. The 2016 VHLSS is the base surveys to impute welfare indicators for VHLSS rounds from 2010 to 2022. The MAPEs of the estimated standard errors are reported in parentheses.
Point estimates and standard errors are adjusted for complex survey designs.

Table 4. Imputation results for the 2010-2022 period using the 2016 VHLSS as the base survey

Welfare indicators	VHLSS 2010		VHLSS 2012		VHLSS 2014		VHLSS 2018		VHLSS 2020		VHLSS 2022	
	True value	Imputed value	True value	Imputed value	True value	Imputed value	True value	Imputed value	True value	Imputed value	True value	Imputed value
Panel A. Normal linear regression												
Per capita consumption (thousand VND)	30886.1	**30349.2**	31772.4	**32137.1**	33623.8	35122.5	43200.0	41797.7	48333.3	**48120.1**	45657.9	49145.3
	(404.5)	(381.9)	(340.0)	(414.3)	(351.8)	(421.6)	(474.4)	(543.3)	(573.3)	(740.8)	(693.8)	(708.5)
Poverty headcount rate (percent)	20.7	19.5	17.2	**16.3**	13.5	11.9	7.0	7.9	5.0	5.8	6.2	5.4
	(0.5)	(0.6)	(0.5)	(0.6)	(0.4)	(0.5)	(0.4)	(0.6)	(0.3)	(0.4)	(0.3)	(0.4)
Poverty gap (percent)	5.9	**5.5**	4.5	**4.6**	3.7	3.2	2.0	**2.2**	1.2	**1.4**	1.6	1.3
	(0.2)	(0.3)	(0.2)	(0.3)	(0.2)	(0.2)	(0.1)	(0.3)	(0.1)	(0.1)	(0.1)	(0.1)
USAID poverty gap (percent)	28.4	**28.5**	26.0	28.1	27.6	**26.6**	28.1	**27.3**	24.7	**24.4**	26.0	**24.8**
	(0.5)	(0.7)	(0.5)	(0.9)	(0.6)	(0.9)	(1.0)	(1.8)	(0.9)	(1.2)	(1.1)	(1.2)
Food poverty headcount rate (percent)	8.9	**8.2**	6.4	**6.7**	5.5	4.5	3.2	**3.1**	1.7	**2.0**	2.4	**1.9**
	(0.4)	(0.5)	(0.3)	(0.5)	(0.3)	(0.4)	(0.3)	(0.5)	(0.2)	(0.2)	(0.2)	(0.2)
Vulnerability rate (percent)	14.9	13.3	13.4	12.0	11.0	**10.2**	6.6	**7.0**	5.3	**5.8**	5.3	**5.2**
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.3)	(0.3)	(0.3)	(0.3)
Panel B. Empirical distribution method												
Per capita consumption (thousand VND)	30886.1	**30503.1**	31772.4	**32323.1**	33623.8	35311.8	43200.0	**42067.4**	48333.3	**48389.3**	45657.9	49428.4
	(404.5)	(434.3)	(340.0)	(431.7)	(351.8)	(430.4)	(474.4)	(577.9)	(573.3)	(718.9)	(693.8)	(709.3)
Poverty headcount rate (percent)	20.7	19.4	17.2	16.1	13.5	11.6	7.0	**7.8**	5.0	**5.6**	6.2	5.3
	(0.5)	(0.6)	(0.5)	(0.7)	(0.4)	(0.5)	(0.4)	(0.5)	(0.3)	(0.4)	(0.3)	(0.5)
Poverty gap (percent)	5.9	**5.4**	4.5	**4.5**	3.7	3.1	2.0	**2.1**	1.2	**1.3**	1.6	1.3
	(0.2)	(0.3)	(0.2)	(0.3)	(0.2)	(0.2)	(0.1)	(0.2)	(0.1)	(0.1)	(0.1)	(0.2)
USAID poverty gap (percent)	28.4	**28.1**	26.0	27.8	27.6	**26.4**	28.1	**26.9**	24.7	**24.0**	26.0	**24.6**
	(0.5)	(0.8)	(0.5)	(0.9)	(0.6)	(1.0)	(1.0)	(1.2)	(0.9)	(1.0)	(1.1)	(1.2)
Food poverty headcount rate (percent)	8.9	8.0	6.4	**6.5**	5.5	4.4	3.2	**3.0**	1.7	**1.9**	2.4	1.9
	(0.4)	(0.5)	(0.3)	(0.5)	(0.3)	(0.4)	(0.3)	(0.3)	(0.2)	(0.2)	(0.2)	(0.3)
Vulnerability rate (percent)	14.9	13.6	13.4	12.2	11.0	**10.3**	6.6	**6.9**	5.3	**5.8**	5.3	**5.1**
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.3)	(0.3)	(0.3)	(0.3)
Adj R-squared	N/A	0.74	N/A	0.74	N/A	0.74	N/A	0.74	N/A	0.74	N/A	0.74
Obs. (the base survey)	N/A	9399	N/A	9399	N/A	9399	N/A	9399	N/A	9399	N/A	9399
Obs. (the target survey)	9399	9399	9399	9399	9399	9399	9399	9396	9389	9389	9398	9398

Note: This table reports the true estimates computed directly from the observed per capita consumption in the VHLSSs, and the imputed estimates computed from the imputed per capita consumption using the 2016 survey as the base. Model 2 (see Table A.7 in the Appendix) is used to model per capita consumption in the 2016 VHLSS.
Estimates falling within the 95% confidence interval (CI) of the true rates are presented in bold. In this table, there are 72 estimates, of which 44 (60%) fall within the 95% CIs. Additionally, 58 estimates (79%) have absolute percentage errors (APE) of less than 10%.
Standard errors are in paratheses.
Point estimates and standard errors are adjusted for complex survey designs.

Table 5. MAPE in imputing welfare indicators for the 1993-2008 period using different VLSS and VHLSS rounds as base surveys

Welfare indicators	Base surveys					
	VLSS 1993	VLSS 1998	VHLSS 2002	VHLSS 2004	VHLSS 2006	VHLSS 2008
Panel A. Normal linear regression method						
Per capita consumption (thousand VND)	17.0	13.7	5.7	5.4	4.8	8.1
	(80.9)	(56.1)	(41.6)	(42.3)	(25.1)	(15.6)
Poverty headcount rate (percent)	8.6	20.4	7.4	7.8	8.1	26.5
	(11.4)	(9.5)	(13.6)	(15.4)	(16.3)	(22.8)
Poverty gap (percent)	13.9	20.3	11.7	10.7	14.6	50.9
	(15.5)	(10.8)	(17.0)	(14.9)	(22.0)	(45.6)
USAID poverty gap (percent)	8.1	3.3	4.4	6.0	8.0	19.4
	(14.9)	(30.7)	(25.3)	(20.5)	(17.7)	(10.6)
Food poverty headcount rate (percent)	17.5	21.0	12.3	12.2	17.2	59.8
	(8.4)	(8.7)	(11.6)	(8.5)	(16.5)	(34.7)
Vulnerability rate (percent)	17.6	19.4	8.5	10.6	9.4	9.0
	(6.2)	(3.9)	(3.9)	(3.2)	(2.9)	(5.8)
Panel B. Empirical distribution method						
Per capita consumption (thousand VND)	18.3	14.5	5.2	5.5	4.7	7.6
	(134.8)	(58.7)	(38.3)	(33.3)	(30.8)	(20.0)
Poverty headcount rate (percent)	8.6	20.7	8.2	8.7	8.9	27.3
	(13.2)	(15.3)	(13.8)	(12.9)	(18.4)	(22.8)
Poverty gap (percent)	14.9	21.2	11.7	11.2	14.3	49.4
	(17.3)	(18.7)	(12.8)	(15.6)	(24.3)	(49.2)
USAID poverty gap (percent)	7.9	3.0	3.8	5.2	6.9	17.5
	(11.3)	(36.4)	(18.4)	(21.2)	(21.4)	(20.5)
Food poverty headcount rate (percent)	18.2	22.2	12.4	13.0	16.7	57.3
	(10.4)	(12.6)	(8.7)	(10.5)	(18.0)	(37.9)
Vulnerability rate (percent)	17.4	18.4	6.7	8.8	7.6	10.6
	(6.0)	(3.5)	(4.9)	(4.1)	(2.0)	(7.4)
MAPE of means	14.0	16.5	8.2	8.8	10.1	28.6
MAPE of standard errors	(27.5)	(22.1)	(17.5)	(16.9)	(17.9)	(24.4)

Note: This table reports the MAPE of both the point estimates and the standard errors of the imputed estimates, using different VLSS and VHLSS rounds as the base surveys to impute welfare indicators for the remaining VLSS and VHLSS rounds. The MAPEs of the estimated standard errors are reported in parentheses. Model 2 is used for imputation in all the survey rounds.
Point estimates and standard errors are adjusted for complex survey designs.

Table 6. MAPE in imputing welfare indicators for the 1993-2008 period using different models and the 2004 VHLSS as the base survey

Welfare indicators	Estimation models					
	Base model (Model 2)	Lasso regression	Rigorous lasso	Elastic net	Forward stepwise	Backward stepwise
Panel A. Normal linear regression method						
Per capita consumption (thousand VND)	5.4	7.1	7.2	7.1	6.8	6.9
	(42.3)	(39.6)	(37.7)	(39.5)	(38.6)	(39.2)
Poverty headcount rate (percent)	7.8	10.5	11.1	10.6	10.1	10.3
	(15.4)	(12.1)	(13.2)	(12.8)	(12.3)	(12.4)
Poverty gap (percent)	10.7	15.2	16.5	16.2	15.3	15.6
	(14.9)	(18.4)	(19.0)	(19.4)	(19.5)	(19.3)
USAID poverty gap (percent)	6.0	5.9	6.2	6.3	6.0	6.0
	(20.5)	(24.4)	(23.9)	(24.1)	(24.0)	(23.8)
Food poverty headcount rate (percent)	12.2	16.8	18.5	18.2	17.1	17.4
	(8.5)	(10.5)	(11.0)	(11.3)	(11.3)	(11.3)
Vulnerability rate (percent)	10.6	12.1	12.3	12.4	12.6	12.5
	(3.2)	(8.2)	(8.4)	(8.3)	(8.0)	(8.1)
Panel B. Empirical distribution method						
Per capita consumption (thousand VND)	5.5	7.2	7.1	7.2	7.0	7.0
	(33.3)	(47.9)	(43.7)	(46.8)	(46.2)	(47.6)
Poverty headcount rate (percent)	8.7	11.6	12.6	12.0	11.6	11.7
	(12.9)	(13.3)	(13.4)	(13.3)	(13.2)	(13.4)
Poverty gap (percent)	11.2	15.2	16.5	16.0	15.2	15.4
	(15.6)	(17.7)	(18.6)	(18.7)	(18.7)	(18.5)
USAID poverty gap (percent)	5.2	4.5	4.8	4.9	4.6	4.6
	(21.2)	(21.2)	(20.9)	(21.3)	(21.4)	(21.2)
Food poverty headcount rate (percent)	13.0	16.3	17.8	17.3	16.4	16.6
	(10.5)	(11.0)	(11.8)	(12.0)	(11.8)	(11.7)
Vulnerability rate (percent)	8.8	10.2	10.3	10.6	10.8	10.7
	(4.1)	(8.3)	(8.5)	(8.5)	(8.2)	(8.3)
MAPE of means	8.8	11.1	11.8	11.6	11.1	11.2
MAPE of standard errors	(16.9)	(19.4)	(19.2)	(19.7)	(19.4)	(19.6)

Note: This table reports the MAPE of both the point estimates and the standard errors of the imputed estimates in different prediction models. The 2004 VHLSS is the base surveys to impute welfare indicators for VHLSS rounds from 1993 to 2004. The MAPEs of the estimated standard errors are reported in parentheses.
Point estimates and standard errors are adjusted for complex survey designs.

Table 7. Imputation results for the 1993-2008 period using the 2004 VHLSS as the base survey

Welfare indicators	VLSS 1993		VLSS 1998		VHLSS 2002		VHLSS 2006		VHLSS 2008	
	True value	Imputed value	True value	Imputed value	True value	Imputed value	True value	Imputed value	True value	Imputed value
Panel A. Normal linear regression method										
Per capita consumption (thousand VND)	8155.3	7442.9	11108.4	10093.9	12307.9	**12434.5**	16180.3	**16349.2**	17515.7	18710.2
	(117.2)	(113.3)	(175.5)	(221.1)	(126.0)	(166.6)	(154.0)	(214.7)	(197.1)	(249.0)
Poverty headcount rate (percent)	58.1	**58.6**	37.4	**39.6**	28.8	27.2	16.0	**15.6**	14.5	10.9
	(1.1)	(1.2)	(1.2)	(1.3)	(0.5)	(0.6)	(0.5)	(0.6)	(0.5)	(0.5)
Poverty gap (percent)	18.5	**19.1**	9.5	11.3	6.9	**7.2**	3.8	**3.9**	3.5	2.5
	(0.6)	(0.6)	(0.5)	(0.5)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)
USAID poverty gap (percent)	31.8	**32.6**	25.5	28.4	24.1	26.3	24.0	**24.9**	24.0	**23.1**
	(0.6)	(0.6)	(0.7)	(0.6)	(0.3)	(0.4)	(0.6)	(0.7)	(0.6)	(0.9)
Food poverty headcount rate (percent)	30.8	**31.4**	13.8	17.2	9.7	**10.5**	5.4	**5.5**	4.6	3.4
	(1.1)	(1.2)	(1.0)	(1.0)	(0.4)	(0.4)	(0.3)	(0.4)	(0.3)	(0.3)
Vulnerability rate (percent)	15.6	17.0	19.3	**18.9**	19.1	17.4	13.6	**13.0**	14.7	10.6
	(0.6)	(0.6)	(0.7)	(0.6)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)
Panel B. Empirical distribution method										
Per capita consumption (thousand VND)	8155.3	7471.6	11108.4	10129.2	12307.9	**12500.1**	16180.3	**16409.9**	17515.7	18786.2
	(117.2)	(136.1)	(175.5)	(241.6)	(126.0)	(167.0)	(154.0)	(252.7)	(197.1)	(266.9)
Poverty headcount rate (percent)	58.1	**59.4**	37.4	40.3	28.8	27.5	16.0	**15.6**	14.5	10.7
	(1.1)	(1.3)	(1.2)	(1.3)	(0.5)	(0.6)	(0.5)	(0.6)	(0.5)	(0.5)
Poverty gap (percent)	18.5	**19.3**	9.5	11.3	6.9	**7.1**	3.8	**3.8**	3.5	2.4
	(0.6)	(0.7)	(0.5)	(0.5)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)
USAID poverty gap (percent)	31.8	**32.5**	25.5	27.9	24.1	25.7	24.0	**24.5**	24.0	22.7
	(0.6)	(0.6)	(0.7)	(0.7)	(0.3)	(0.5)	(0.6)	(0.7)	(0.6)	(0.8)
Food poverty headcount rate (percent)	30.8	**31.9**	13.8	17.2	9.7	**10.3**	5.4	**5.3**	4.6	3.2
	(1.1)	(1.3)	(1.0)	(1.1)	(0.4)	(0.4)	(0.3)	(0.4)	(0.3)	(0.3)
Vulnerability rate (percent)	15.6	**16.5**	19.3	**18.9**	19.1	17.7	13.6	**13.4**	14.7	10.9
	(0.6)	(0.6)	(0.7)	(0.7)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)
Adj R-squared	N/A	0.76	N/A	0.76	N/A	0.76	N/A	0.76	N/A	0.76
Obs. (the base survey)	N/A	9147	N/A	9147	N/A	9147	N/A	9147	N/A	9147
Obs. (the target survey)	4799	4799	5999	5999	29530	29530	9178	9178	9183	9183

Note: This table reports the true estimates computed directly from the observed per capita consumption in the VHLSSs, and the imputed estimates computed from the imputed per capita consumption using the 2004 survey as the base. Model 2 (see Table A.7 in the Appendix) is used to model per capita consumption in the 2004 VHLSS.
Estimates falling within the 95% CI of the true rates are presented in bold. In this table, there are 60 estimates, of which 29 estimates (48%) fall into the 95 confidence intervals. There are 47 estimates (78%) having the absolute percentage errors less than 10%.
Standard errors are in paratheses.
Point estimates and standard errors are adjusted for complex survey designs.

Table 8. Imputation results for the 1993-2008 period using the 2016 VHLSS as the base survey

	VLSS 1993	VLSS 1998	VHLSS 2002	VHLSS 2004	VHLSS 2006	VHLSS 2008
Panel A. Normal linear regression method						
Per capita consumption (thousand VND)	10457.4	14766.0	18558.2	21802.0	24078.0	26990.7
	(248.1)	(345.7)	(242.6)	(271.9)	(289.9)	(362.7)
Poverty headcount rate (percent)	78.4	60.5	45.6	35.3	29.4	22.9
	(1.1)	(1.4)	(0.7)	(0.8)	(0.7)	(0.7)
Poverty gap (percent)	37.4	24.0	15.8	11.1	8.8	6.4
	(1.0)	(0.9)	(0.4)	(0.4)	(0.4)	(0.3)
USAID poverty gap (percent)	47.7	39.7	34.6	31.6	29.8	27.9
	(0.7)	(0.8)	(0.4)	(0.6)	(0.7)	(0.7)
Food poverty headcount rate (percent)	60.5	38.6	24.7	17.0	13.1	9.4
	(1.5)	(1.6)	(0.6)	(0.6)	(0.6)	(0.5)
Vulnerability rate (percent)	9.5	14.3	16.8	17.0	16.5	15.2
	(0.5)	(0.6)	(0.4)	(0.5)	(0.5)	(0.5)
Panel B. Empirical distribution method						
Per capita consumption (thousand VND)	10517.4	14840.4	18686.5	21933.3	24227.0	27167.8
	(197.6)	(344.8)	(239.1)	(305.4)	(309.2)	(345.8)
Poverty headcount rate (percent)	78.7	61.0	46.0	35.5	29.6	22.8
	(0.9)	(1.4)	(0.7)	(0.8)	(0.8)	(0.7)
Poverty gap (percent)	37.5	24.1	15.7	11.0	8.7	6.3
	(0.9)	(1.0)	(0.4)	(0.4)	(0.4)	(0.3)
USAID poverty gap (percent)	47.7	39.5	34.2	31.0	29.3	27.5
	(0.7)	(0.9)	(0.5)	(0.7)	(0.7)	(0.7)
Food poverty headcount rate (percent)	60.6	38.8	24.5	16.7	12.9	9.1
	(1.4)	(1.7)	(0.7)	(0.7)	(0.6)	(0.5)
Vulnerability rate (percent)	9.2	14.3	17.0	17.5	16.8	15.6
	(0.5)	(0.6)	(0.4)	(0.5)	(0.5)	(0.5)
Adj R-squared	0.74	0.74	0.74	0.74	0.74	0.74
Obs. (the base survey)	9399	9399	9399	9399	9399	9399
Obs. (the target survey)	4799	5999	29530	9176	9178	9183

Note: This table reports the imputed estimates for the 1993-2008 period, which are computed from the imputed per capita consumption using the 2016 survey as the base. Model 2 (see Table A.7 in the Appendix) is used to model per capita consumption in the 2016 VHLSS.
Standard errors are in paratheses.
Point estimates and standard errors are adjusted for complex survey designs.

Table 9. Imputation results for the 2010-2022 period using the 2004 VHLSS as the base survey

Welfare indicators	VHLSS 2010	VHLSS 2012	VHLSS 2014	VHLSS 2016	VHLSS 2018	VHLSS 2020	VHLSS 2022
Panel A. Normal linear regression method							
Per capita consumption (thousand VND)	21112.6	22380.2	24389.4	27072.4	29683.5	34406.0	35120.2
	(315.4)	(357.9)	(302.8)	(342.6)	(378.0)	(653.9)	(499.4)
Poverty headcount rate (percent)	9.6	8.0	5.4	4.9	3.6	2.4	2.3
	(0.5)	(0.4)	(0.3)	(0.4)	(0.4)	(0.2)	(0.3)
Poverty gap (percent)	2.3	2.0	1.2	1.2	0.8	0.5	0.5
	(0.2)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
USAID poverty gap (percent)	24.4	24.4	22.9	24.0	23.5	21.5	22.6
	(0.8)	(0.9)	(1.0)	(1.2)	(1.6)	(1.3)	(1.5)
Food poverty headcount rate (percent)	3.3	2.7	1.7	1.6	1.2	0.7	0.7
	(0.3)	(0.2)	(0.2)	(0.2)	(0.2)	(0.1)	(0.1)
Vulnerability rate (percent)	8.8	7.6	5.8	4.8	3.7	2.9	2.6
	(0.4)	(0.3)	(0.3)	(0.3)	(0.3)	(0.2)	(0.2)
Panel B. Empirical distribution method							
Per capita consumption (thousand VND)	21199.3	22468.8	24509.2	27183.9	29821.9	34553.5	35269.2
	(296.4)	(315.7)	(330.1)	(358.6)	(399.3)	(646.2)	(570.1)
Poverty headcount rate (percent)	9.5	7.9	5.3	4.8	3.5	2.3	2.3
	(0.5)	(0.5)	(0.4)	(0.4)	(0.4)	(0.2)	(0.3)
Poverty gap (percent)	2.3	1.9	1.2	1.1	0.8	0.5	0.5
	(0.2)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
USAID poverty gap (percent)	24.0	24.1	22.6	23.7	23.4	20.9	22.0
	(0.8)	(0.9)	(0.9)	(1.2)	(1.4)	(1.3)	(1.6)
Food poverty headcount rate (percent)	3.2	2.6	1.6	1.6	1.1	0.6	0.7
	(0.3)	(0.3)	(0.2)	(0.2)	(0.2)	(0.1)	(0.1)
Vulnerability rate (percent)	8.9	7.7	5.8	4.8	3.7	2.9	2.5
	(0.4)	(0.4)	(0.3)	(0.3)	(0.3)	(0.2)	(0.2)
Adj R-squared	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Obs. (the base survey)	9147	9147	9147	9147	9147	9147	9147
Obs. (the target survey)	9399	9399	9399	9399	9396	9389	9398

Note: This table reports the imputed estimates for the 2010-2022 period, which are computed from the imputed per capita consumption using the 2004 VHLSS as the base. Model 2 (see Table A.7 in the Appendix) is used to model per capita consumption in the 2004 VHLSS.
Standard errors are in paratheses.
Point estimates and standard errors are adjusted for complex survey designs.

Table 10. Consistent estimates of per capita consumption and poverty rates of regions over time

	VLSS 1993	VLSS 1998	VHLSS 2002	VHLSS 2004	VHLSS 2006	VHLSS 2008	VHLSS 2010	VHLSS 2012	VHLSS 2014	VHLSS 2016	VHLSS 2018	VHLSS 2020	VHLSS 2022
A. Per capita consumption (thousand VND, the 2020 price)													
Red River Delta	13641.3	19315.6	21359.5	25468.4	27801.1	31220.0	38850.7	39546.7	39551.4	44197.0	48600.9	56864.7	57858.7
	(147.1)	(199.0)	(105.2)	(220.2)	(243.2)	(271.6)	(1092.1)	(875.3)	(868.0)	(967.5)	(1054.4)	(1125.1)	(2432.2)
Northern Midlands and Mountain Areas	7817.7	11369.3	14567.3	16667.9	18588.5	20968.3	19703.2	21760.2	22294.3	25566.4	28337.8	32505.4	31082.5
	(120.8)	(166.3)	(87.3)	(166.8)	(192.7)	(208.0)	(451.2)	(482.5)	(557.8)	(530.4)	(865.8)	(725.2)	(673.0)
Northern and Coastal Central	10625.8	15237.1	18844.7	21617.3	23122.7	25861.7	25645.6	28553.0	31156.0	34540.8	39546.3	42409.6	39989.7
	(134.5)	(155.1)	(89.5)	(186.6)	(195.2)	(218.2)	(482.1)	(516.1)	(602.7)	(704.8)	(852.2)	(909.3)	(794.0)
Central Highlands	7427.8	10076.9	15693.2	18292.0	20697.1	24050.8	23565.4	27563.4	26429.5	31111.8	35806.5	35803.9	36319.7
	(252.1)	(205.7)	(163.6)	(303.7)	(338.4)	(388.5)	(885.3)	(1172.5)	(1125.5)	(1308.9)	(2033.8)	(1367.9)	(1633.3)
Southeast	16116.2	24964.6	27319.9	32400.1	36487.7	39768.2	43811.8	41129.0	44075.6	54359.1	60309.5	70383.3	58985.5
	(272.8)	(305.2)	(203.8)	(409.6)	(468.0)	(508.0)	(1687.6)	(1280.0)	(1271.5)	(1610.3)	(1603.3)	(2262.4)	(1521.9)
Mekong River Delta	9860.5	14282.6	16924.0	20041.1	22509.0	25056.5	26791.5	26995.1	29732.2	36510.1	40605.6	37138.4	35808.5
	(121.5)	(177.7)	(85.5)	(183.0)	(203.0)	(221.2)	(479.2)	(502.0)	(455.3)	(645.3)	(754.0)	(863.8)	(666.5)
B. Poverty headcount rate (%)													
Red River Delta	63.5	38.9	32.3	22.1	18.0	12.3	11.9	7.5	5.2	2.2	1.3	0.6	0.4
	(1.1)	(1.0)	(0.5)	(0.7)	(0.7)	(0.6)	(0.9)	(0.7)	(0.5)	(0.4)	(0.3)	(0.2)	(0.2)
Northern Midlands and Mountain Areas	90.1	73.0	59.8	51.7	45.1	38.0	44.9	41.9	37.3	28.0	23.5	16.0	18.4
	(0.9)	(1.3)	(0.5)	(0.9)	(0.8)	(0.8)	(1.5)	(1.6)	(1.5)	(1.4)	(1.4)	(1.2)	(1.2)
Northern and Coastal Central	77.6	55.0	41.0	31.9	27.0	20.9	23.7	18.3	14.7	11.8	6.6	4.8	5.9
	(0.9)	(1.0)	(0.5)	(0.8)	(0.8)	(0.7)	(1.3)	(1.3)	(1.3)	(1.4)	(1.1)	(0.8)	(0.8)
Central Highlands	91.0	78.4	56.5	44.3	37.2	28.6	32.7	29.6	30.4	24.1	20.5	17.2	19.3
	(1.9)	(1.6)	(0.8)	(1.4)	(1.4)	(1.2)	(2.8)	(2.6)	(2.7)	(2.5)	(2.4)	(2.4)	(2.6)
Southeast	57.7	31.9	26.0	15.1	11.4	7.6	7.0	5.0	3.7	0.6	0.4	0.5	1.5
	(1.2)	(0.9)	(0.6)	(0.8)	(0.8)	(0.7)	(1.0)	(0.8)	(0.7)	(0.2)	(0.2)	(0.2)	(0.6)
Mekong River Delta	81.7	62.8	50.0	37.4	28.6	21.7	18.7	16.2	9.8	5.9	2.1	3.7	5.7
	(0.8)	(0.9)	(0.4)	(0.8)	(0.8)	(0.7)	(1.1)	(1.0)	(0.8)	(0.7)	(0.4)	(0.5)	(0.7)

Note: For the VHLSSs 2010 to 2022, this table reports the estimates computed directly from the observed per capita consumption. For the VLSS 1993 to VHLSS 2008, it reports the imputed estimates computed from the imputed per capita consumption using the 2016 survey as the base. Model 2 (see Table A.7 in the Appendix) is used to model per capita consumption in the 2016 VHLSS.
Standard errors are reported in parentheses.
Point estimates and standard errors are adjusted for complex survey designs.

Appendix A: Additional tables and figures

Table A.1. Number of households by interview months

Interview months	VLSS 1993	VLSS 1998	VHLSS 2002	VHLSS 2004	VHLSS 2006	VHLSS 2008	VHLSS 2010	VHLSS 2012	VHLSS 2014	VHLSS 2016	VHLSS 2018	VHLSS 2020	VHLSS 2022
January	4	281	6,398	0	0	0	0	3	0	0	0	0	783
February	202	280	1,117	0	0	0	0	0	0	0	0	0	783
March	521	734	104	0	0	0	0	763	2,308	2,199	2,322	2,430	782
April	497	672	55	0	0	0	0	1,568	38	0	9	0	783
May	484	642	6,388	147	166	0	0	35	0	0	0	0	783
June	496	557	976	4,040	3,987	3,201	343	2,301	2,338	2,349	2,340	2,376	786
July	468	435	53	430	286	2,762	2,777	40	16	0	9	0	783
August	448	708	4,267	55	80	170	30	5	1	0	0	0	780
September	351	676	3,185	3,374	2,866	2,065	2,996	2,307	2,317	2,499	2,349	2,307	786
October	223	524	5,374	965	1,665	959	160	35	32	0	0	0	783
November	523	158	953	165	128	26	31	32	0	0	0	0	783
December	582	332	660	0	0	0	3,062	2,310	2,349	2,352	2,367	2,276	783
All sample	4,799	5,999	29,530	9,176	9,178	9,183	9,399	9,399	9,399	9,399	9,396	9,389	9,398

Table A.2. Summary statistics of geographic variables and characteristics of household heads and spouses

Variables	VLSS 1993	VLSS 1998	VHLSS 2002	VHLSS 2004	VHLSS 2006	VHLSS 2008	VHLSS 2010	VHLSS 2012	VHLSS 2014	VHLSS 2016	VHLSS 2018	VHLSS 2020	VHLSS 2022
Red River Delta	0.273	0.261	0.258	0.254	0.251	0.252	0.248	0.241	0.243	0.245	0.240	0.245	0.243
	(0.009)	(0.011)	(0.001)	(0.008)	(0.008)	(0.008)	(0.001)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)
Northern Midlands and Mountain Areas	0.133	0.138	0.124	0.125	0.127	0.125	0.125	0.129	0.121	0.130	0.133	0.122	0.120
	(0.009)	(0.010)	(0.001)	(0.004)	(0.005)	(0.005)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Northern and Coastal Central	0.227	0.223	0.235	0.232	0.233	0.229	0.217	0.220	0.213	0.221	0.227	0.207	0.202
	(0.000)	(0.004)	(0.001)	(0.007)	(0.007)	(0.007)	(0.001)	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)
Central Highlands	0.027	0.030	0.051	0.048	0.052	0.052	0.054	0.054	0.056	0.061	0.062	0.057	0.058
	(0.005)	(0.004)	(0.001)	(0.004)	(0.004)	(0.005)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.004)
Southeast	0.133	0.145	0.126	0.135	0.136	0.142	0.168	0.168	0.176	0.163	0.165	0.197	0.202
	(0.005)	(0.007)	(0.001)	(0.009)	(0.008)	(0.009)	(0.001)	(0.003)	(0.002)	(0.002)	(0.004)	(0.003)	(0.003)
Mekong River Delta	0.207	0.203	0.206	0.206	0.202	0.199	0.188	0.188	0.191	0.180	0.173	0.172	0.176
	(0.000)	(0.005)	(0.001)	(0.007)	(0.007)	(0.007)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)
Urban dummy	0.200	0.240	0.242	0.265	0.275	0.280	0.305	0.300	0.339	0.321	0.340	0.374	0.398
	(0.000)	(0.007)	(0.001)	(0.010)	(0.010)	(0.010)	(0.001)	(0.002)	(0.003)	(0.002)	(0.004)	(0.003)	(0.003)
Age of head	45.344	47.789	47.978	49.517	49.784	50.355	48.725	50.166	51.222	52.094	52.701	50.957	52.723
	(0.298)	(0.248)	(0.124)	(0.159)	(0.151)	(0.170)	(0.165)	(0.174)	(0.190)	(0.174)	(0.179)	(0.184)	(0.181)
Sex of household head (male=1, female=0)	0.731	0.737	0.757	0.745	0.745	0.744	0.740	0.739	0.729	0.743	0.735	0.728	0.705
	(0.008)	(0.008)	(0.004)	(0.006)	(0.005)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)
Household head living with a spouse	0.784	0.791	0.797	0.788	0.792	0.789	0.787	0.781	0.772	0.770	0.766	0.762	0.743
	(0.007)	(0.006)	(0.003)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Household head with upper-secondary education	0.124	0.121	0.146	0.180	0.184	0.198	0.196	0.195	0.190	0.185	0.208	0.209	0.188
	(0.006)	(0.005)	(0.003)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Household head with post-secondary education	0.022	0.027	0.040	0.048	0.049	0.050	0.075	0.071	0.080	0.086	0.097	0.121	0.103
	(0.003)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.005)	(0.004)
Household head is leader/manager	0.013	0.018	0.017	0.024	0.026	0.024	0.017	0.016	0.015	0.017	0.014	0.013	0.010
	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
Household head has a professional job	0.030	0.035	0.040	0.046	0.048	0.046	0.067	0.064	0.059	0.055	0.063	0.073	0.071
	(0.003)	(0.003)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)
Spouse with upper-secondary education	0.081	0.084	0.103	0.114	0.117	0.120	0.123	0.119	0.118	0.126	0.129	0.145	0.133
	(0.005)	(0.005)	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Spouse with post-secondary education	0.015	0.016	0.026	0.031	0.032	0.037	0.053	0.053	0.063	0.063	0.074	0.094	0.077
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)
Spouse is leader/manager	0.005	0.004	0.004	0.005	0.005	0.004	0.005	0.005	0.006	0.005	0.006	0.004	0.003
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Spouse has a professional job	0.029	0.029	0.036	0.039	0.041	0.042	0.051	0.048	0.050	0.048	0.053	0.063	0.054
	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)

Note: Point estimates and standard errors are adjusted for complex survey designs. Standard errors of the means are in parentheses.

Table A.3. Summary statistics of household composition and housing conditions

Variables	VLSS 1993	VLSS 1998	VHLSS 2002	VHLSS 2004	VHLSS 2006	VHLSS 2008	VHLSS 2010	VHLSS 2012	VHLSS 2014	VHLSS 2016	VHLSS 2018	VHLSS 2020	VHLSS 2022
Ethnic minority households (ethnic minorities=1, Kinh=0)	0.118	0.123	0.105	0.105	0.113	0.111	0.127	0.129	0.123	0.139	0.136	0.119	0.104
	(0.014)	(0.014)	(0.004)	(0.004)	(0.005)	(0.005)	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)	(0.004)	(0.004)
Household size	4.967	4.700	4.434	4.344	4.202	4.118	3.871	3.844	3.796	3.777	3.706	3.638	3.604
	(0.040)	(0.037)	(0.015)	(0.019)	(0.019)	(0.020)	(0.017)	(0.018)	(0.019)	(0.020)	(0.020)	(0.019)	(0.021)
Proportion of household members aged below 15	0.341	0.287	0.265	0.239	0.212	0.200	0.205	0.200	0.197	0.195	0.191	0.203	0.187
	(0.004)	(0.004)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.002)
Proportion of female members	0.528	0.527	0.513	0.514	0.518	0.520	0.520	0.522	0.523	0.523	0.522	0.515	0.521
	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.002)	(0.003)	(0.003)
Proportion of household members aged from 60 years	0.105	0.133	0.118	0.128	0.132	0.135	0.125	0.143	0.151	0.170	0.186	0.170	0.195
	(0.004)	(0.004)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Proportion of hh. members with upper secondary education	0.083	0.086	0.116	0.149	0.167	0.183	0.181	0.179	0.174	0.172	0.181	0.182	0.176
	(0.004)	(0.003)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Proportion of hh. members with post-secondary education	0.012	0.015	0.027	0.036	0.038	0.043	0.061	0.063	0.077	0.081	0.091	0.099	0.087
	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)
Per capita living areas (m2)	9.681	11.456	14.429	15.770	17.234	19.149	20.627	22.223	24.756	26.062	27.989	29.347	32.460
	(0.160)	(0.167)	(0.142)	(0.142)	(0.163)	(0.178)	(0.229)	(0.227)	(0.267)	(0.262)	(0.308)	(0.319)	(0.353)
Households with tap water	0.079	0.139	0.175	0.195	0.232	0.263	0.273	0.301	0.354	0.389	0.440	0.491	0.544
	(0.008)	(0.010)	(0.006)	(0.007)	(0.008)	(0.009)	(0.005)	(0.006)	(0.006)	(0.006)	(0.007)	(0.006)	(0.007)
Household with clean water	0.710	0.619	0.604	0.652	0.648	0.642	0.614	0.591	0.553	0.517	0.523	0.490	0.438
	(0.018)	(0.016)	(0.006)	(0.008)	(0.008)	(0.008)	(0.006)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Household with flush latrine	0.104	0.170	0.217	0.285	0.340	0.405	0.502	0.562	0.656	0.708	0.818	0.888	0.916
	(0.007)	(0.009)	(0.005)	(0.008)	(0.008)	(0.009)	(0.006)	(0.006)	(0.006)	(0.005)	(0.005)	(0.004)	(0.003)
Living in a permanent house	0.165	0.157	0.172	0.211	0.238	0.282	0.305	0.314	0.356	0.344	0.395	0.445	0.507
	(0.011)	(0.009)	(0.004)	(0.006)	(0.007)	(0.007)	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Living in a semi- permanent house	0.470	0.592	0.591	0.588	0.601	0.588	0.591	0.599	0.575	0.586	0.550	0.512	0.461
	(0.014)	(0.012)	(0.005)	(0.006)	(0.007)	(0.007)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.007)

Note: Point estimates and standard errors are adjusted for complex survey designs. Standard errors of the means are in parentheses.

Table A.4. Summary statistics of household durables

Variables	VLSS 1993	VLSS 1998	VHLSS 2002	VHLSS 2004	VHLSS 2006	VHLSS 2008	VHLSS 2010	VHLSS 2012	VHLSS 2014	VHLSS 2016	VHLSS 2018	VHLSS 2020	VHLSS 2022
Telephone	0.000	0.069	0.134	0.227	0.315	0.478	0.795	0.849	0.856	0.925	0.910	0.961	0.980
	(0.000)	(0.004)	(0.004)	(0.007)	(0.007)	(0.007)	(0.005)	(0.004)	(0.005)	(0.004)	(0.005)	(0.002)	(0.002)
Stereos	0.016	0.050	0.062	0.099	0.131	0.160	0.144	0.135	0.133	0.140	0.130	0.112	0.084
	(0.002)	(0.003)	(0.002)	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)
Radio	0.255	0.425	0.255	0.195	0.123	0.068	0.046	0.030	0.027	0.022	0.015	0.011	0.009
	(0.008)	(0.009)	(0.004)	(0.005)	(0.004)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
Color TV	0.091	0.380	0.556	0.695	0.791	0.878	0.884	0.912	0.882	0.925	0.888	0.882	0.892
	(0.006)	(0.012)	(0.005)	(0.006)	(0.005)	(0.004)	(0.004)	(0.003)	(0.005)	(0.003)	(0.005)	(0.004)	(0.004)
Black-and-white TV	0.133	0.178	0.125	0.091	0.056	0.022	0.012	0.008	0.004	0.004	0.004	0.004	0.004
	(0.006)	(0.008)	(0.003)	(0.004)	(0.003)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
PC Computer	0.000	0.007	0.025	0.062	0.081	0.115	0.168	0.180	0.199	0.220	0.208	0.204	0.234
	(0.000)	(0.001)	(0.002)	(0.004)	(0.004)	(0.006)	(0.004)	(0.005)	(0.005)	(0.005)	(0.006)	(0.005)	(0.006)
Gas stove	0.058	0.069	0.179	0.300	0.378	0.477	0.617	0.693	0.718	0.815	0.840	0.908	0.896
	(0.006)	(0.005)	(0.004)	(0.007)	(0.007)	(0.007)	(0.006)	(0.005)	(0.006)	(0.005)	(0.006)	(0.003)	(0.004)
Electric rice cooker	0.058	0.193	0.369	0.524	0.610	0.713	0.776	0.817	0.788	0.860	0.850	0.915	0.931
	(0.006)	(0.008)	(0.005)	(0.007)	(0.006)	(0.006)	(0.005)	(0.005)	(0.006)	(0.004)	(0.005)	(0.003)	(0.003)
Bike	0.648	0.729	0.687	0.705	0.674	0.663	0.560	0.544	0.503	0.521	0.440	0.400	0.383
	(0.013)	(0.012)	(0.005)	(0.006)	(0.007)	(0.007)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Motorbike	0.107	0.203	0.404	0.511	0.603	0.695	0.759	0.804	0.788	0.855	0.841	0.900	0.905
	(0.006)	(0.008)	(0.004)	(0.007)	(0.006)	(0.006)	(0.005)	(0.004)	(0.006)	(0.004)	(0.005)	(0.003)	(0.003)
Washing machine	0.003	0.022	0.039	0.066	0.092	0.134	0.192	0.231	0.273	0.354	0.444	0.549	0.594
	(0.001)	(0.002)	(0.002)	(0.004)	(0.005)	(0.006)	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Electric fan	0.307	0.684	0.675	0.795	0.817	0.853	0.852	0.883	0.855	0.905	0.883	0.934	0.930
	(0.013)	(0.016)	(0.005)	(0.005)	(0.005)	(0.005)	(0.004)	(0.004)	(0.005)	(0.004)	(0.005)	(0.003)	(0.004)
Electric water heater	0.000	0.014	0.035	0.053	0.072	0.101	0.144	0.176	0.225	0.278	0.333	0.400	0.448
	(0.000)	(0.002)	(0.002)	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)
Fridge	0.041	0.090	0.124	0.179	0.235	0.330	0.426	0.494	0.575	0.698	0.764	0.847	0.877
	(0.004)	(0.005)	(0.003)	(0.007)	(0.007)	(0.008)	(0.006)	(0.006)	(0.006)	(0.005)	(0.006)	(0.004)	(0.004)
Air-conditioner	0.001	0.007	0.010	0.022	0.029	0.044	0.082	0.088	0.120	0.187	0.253	0.373	0.421
	(0.000)	(0.001)	(0.001)	(0.002)	(0.003)	(0.004)	(0.003)	(0.003)	(0.004)	(0.005)	(0.006)	(0.006)	(0.006)
Electric water pump	0.032	0.153	0.271	0.352	0.365	0.434	0.449	0.454	0.473	0.501	0.483	0.457	0.443
	(0.004)	(0.010)	(0.006)	(0.007)	(0.007)	(0.007)	(0.006)	(0.007)	(0.006)	(0.007)	(0.007)	(0.006)	(0.007)

Note: Point estimates and standard errors are adjusted for complex survey designs. Standard errors of the means are in parentheses.

Table A.5. Summary statistics of household consumptions and other village- and district-level variables

Variables	VLSS 1993	VLSS 1998	VHLSS 2002	VHLSS 2004	VHLSS 2006	VHLSS 2008	VHLSS 2010	VHLSS 2012	VHLSS 2014	VHLSS 2016	VHLSS 2018	VHLSS 2020	VHLSS 2022
Household-level variables													
Per capita consumption on education (thousand VND)	206.0	667.3	683.5	768.6	936.6	1185.2	1436.4	1454.7	1380.1	1584.6	1885.8	1932.7	1864.1
	(8.4)	(21.7)	(12.1)	(18.1)	(19.1)	(37.8)	(59.0)	(59.8)	(34.1)	(76.4)	(65.1)	(56.0)	(56.7)
Per capita consumption on health (thousand VND)	510.6	625.7	653.6	901.5	938.9	1239.8	1337.1	1284.2	1392.2	1711.4	2087.7	1990.7	2452.9
	(13.6)	(20.0)	(13.8)	(27.5)	(26.7)	(41.7)	(34.8)	(34.7)	(34.6)	(41.7)	(123.0)	(87.8)	(264.3)
Per capita consumption on electricity (thousand VND)	132.0	263.1	324.0	425.1	456.8	514.4	619.2	689.6	862.4	1032.6	1171.1	1373.8	1783.4
	(5.5)	(7.8)	(5.6)	(7.4)	(8.0)	(9.3)	(10.3)	(9.1)	(10.5)	(11.9)	(13.2)	(15.2)	(387.7)
Per capita consumption on garbage disposal (thousand VND)	3.3	8.6	10.3	13.8	15.0	17.8	21.5	21.9	30.4	33.9	40.5	51.1	62.6
	(0.2)	(0.6)	(0.3)	(0.4)	(0.3)	(0.4)	(0.4)	(0.4)	(0.7)	(0.6)	(0.7)	(0.9)	(1.0)
Per capita consumption on water (thousand VND)	28.6	50.8	53.1	68.7	77.9	83.1	104.8	100.8	142.0	156.2	177.3	221.4	258.0
	(2.6)	(3.3)	(2.3)	(2.4)	(3.5)	(2.4)	(3.1)	(2.8)	(3.5)	(3.2)	(3.6)	(4.6)	(9.9)
Village-level variables													
Village with car-accessible road	0.687	0.686	0.664	0.917	0.912	0.617	0.927	0.945	0.954	0.969	0.981	0.986	0.989
	(0.012)	(0.018)	(0.006)	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)
Village with an all-weather passable road	0.573	0.613	0.830	0.856	0.854	0.868	0.877	0.901	0.916	0.942	0.959	0.967	0.980
	(0.018)	(0.019)	(0.004)	(0.006)	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)	(0.004)	(0.003)	(0.003)	(0.002)
Village with periodic market	0.106	0.167	0.340	0.519	0.509	0.516	0.515	0.530	0.560	0.554	0.634	0.647	0.645
	(0.012)	(0.014)	(0.008)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Village with post office	0.273	0.241	0.338	0.531	0.512	0.516	0.500	0.509	0.524	0.522	0.601	0.610	0.615
	(0.019)	(0.016)	(0.009)	(0.007)	(0.007)	(0.008)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Distance from village to nearest town (km)	N/A	9.675	6.366	6.575	7.421	6.895	7.587	7.711	7.151	8.091	6.452	6.159	6.766
	N/A	(0.322)	(0.138)	(0.126)	(0.132)	(0.140)	(0.154)	(0.154)	(0.163)	(0.164)	(0.151)	(0.138)	(0.166)
District-level variables													
Nighttime light density	6.096	9.742	12.396	13.802	13.878	14.304	15.571	16.231	18.528	19.055	22.429	29.929	33.021
	(0.197)	(0.000)	(0.176)	(0.156)	(0.172)	(0.222)	(0.167)	(0.211)	(0.215)	(0.217)	(0.253)	(0.726)	(0.680)

Note: Point estimates and standard errors are adjusted for complex survey designs. Standard errors of the means are in parentheses.

Table A.6. Regression of log of real per capita consumption: Model 1

Predictor variables	VLSS 1993	VLSS 1998	VHLSS 2002	VHLSS 2004	VHLSS 2006	VHLSS 2008	VHLSS 2010	VHLSS 2012	VHLSS 2014	VHLSS 2016	VHLSS 2018	VHLSS 2020	VHLSS 2022
Ethnic minorities	-0.1075***	-0.0852***	-0.0536***	-0.0671***	-0.0664***	-0.0461***	-0.1074***	-0.0538***	-0.1009***	-0.0662***	-0.0656***	-0.0736***	-0.1040***
Household size	-0.0319***	-0.0539***	-0.0508***	-0.0490***	-0.0510***	-0.0617***	-0.0729***	-0.0654***	-0.0606***	-0.0707***	-0.0562***	-0.0568***	-0.0732***
Proportion of children	-0.2911***	-0.2844***	-0.3740***	-0.3566***	-0.3345***	-0.3165***	-0.3129***	-0.3055***	-0.2495***	-0.2585***	-0.2949***	-0.2351***	-0.2513***
Proportion of females	-0.0507*	-0.0730***	-0.0456***	-0.0694***	-0.0374*	-0.0569***	-0.0516***	-0.0823***	-0.0289	-0.0560***	-0.0751***	-0.0360**	-0.0007
Proportion of elderly	-0.1580***	-0.0894***	-0.1122***	-0.0811***	-0.0905***	-0.0611***	-0.0708***	-0.0711***	-0.0769***	-0.0437***	-0.1037***	-0.0278	-0.0083
Ratio of upper secondary	0.1476***	0.0700*	0.1767***	0.2334***	0.2321***	0.1963***	0.1553***	0.2092***	0.2315***	0.1851***	0.1777***	0.1910***	0.1524***
Ratio of post secondary	0.1445	0.3625***	0.3907***	0.4356***	0.4638***	0.4892***	0.3643***	0.3025***	0.3994***	0.3249***	0.3497***	0.3148***	0.2702***
Male household head	0.0116	0.0211	0.0194***	0.0251***	0.0392***	0.0139	0.0107	0.0174	0.0284***	0.0314***	0.0117	0.0255**	0.0222**
Household head age	-0.0003	-0.0012***	-0.0007***	-0.0008*	-0.0008***	-0.0010**	-0.0012***	-0.0019***	-0.0015***	-0.0015***	-0.0017***	-0.0023***	-0.0024***
Living with spouse	0.0181	-0.0149	-0.0188***	-0.0368***	-0.0441***	-0.0383***	-0.0182	-0.0558***	-0.0407***	-0.0648***	-0.0378***	-0.0542***	-0.0601***
Head is leader	0.1038**	0.0434	0.0562***	0.0995***	0.0770***	0.0734***	0.0574**	0.1321***	0.1355***	0.1081***	0.2214***	0.1748***	0.2094***
Head is professional	0.0664**	0.0616***	0.0640***	0.0539***	0.0703***	0.0548***	0.0433**	0.0298*	0.0623***	0.0689***	0.0266	0.0381**	0.0284
Stereos	0.2161***	0.1274***	0.0960***	0.0884***	0.0801***	0.0765***	0.0687***	0.0634***	0.0509***	0.0795***	0.1084***	0.0690***	0.1247***
Motorbike	0.3669***	0.2604***	0.2285***	0.1976***	0.1925***	0.1915***	0.1756***	0.1489***	0.1278***	0.1600***	0.0945***	0.1163***	0.1104***
Washing machine	0.2732***	0.0481	0.0663***	0.0871***	0.0797***	0.1010***	0.0719***	0.0813***	0.0514***	0.0819***	0.0833***	0.0848***	0.0935***
Fridge	0.1426***	0.1162***	0.1110***	0.1110***	0.1104***	0.0985***	0.1150***	0.1039***	0.0784***	0.0790***	0.0530***	0.0594***	0.0925***
Air conditioner	0.2198	0.1814***	0.1641***	0.2026***	0.2040***	0.2328***	0.2022***	0.1486***	0.1476***	0.1492***	0.0992***	0.1013***	0.1037***
Log living area	0.2091***	0.1713***	0.1374***	0.1595***	0.1574***	0.1291***	0.2192***	0.2199***	0.2237***	0.2085***	0.2352***	0.2487***	0.2353***
Tap water	0.0985***	0.0926***	0.0660***	0.0897***	0.0402**	-0.0039	0.0536***	0.0540***	0.0582***	0.0330*	0.0167	0.0694**	0.0196
Clean water	0.0571***	0.0434***	0.0375***	0.0228**	0.0007	-0.0075	0.0231*	0.0133	0.0096	0.0048	0.0088	0.0379	-0.0201
Flush latrine	0.0964***	0.0435***	0.0769***	0.0754***	0.0898***	0.0687***	0.0883***	0.0852***	0.0829***	0.0922***	0.1035***	0.0857***	0.0597***
Log utility consumption	0.0401***	0.0491***	0.0427***	0.0457***	0.0559***	0.0691***	0.0701***	0.0684***	0.0880***	0.1053***	0.1316***	0.1451***	0.1246***
Log education and health consumption	0.1082***	0.1100***	0.1040***	0.1056***	0.0884***	0.1012***	0.0641***	0.0594***	0.0840***	0.0672***	0.0912***	0.0767***	0.0483***
Head post-secondary	-0.0703	-0.0185	-0.0419***	-0.1015***	-0.0480***	-0.0631***	0.0146	0.0212	-0.0472**	0.0050	0.0077	-0.0170	-0.0005
Head upper-secondary	0.0642***	0.0354**	0.0015	-0.0282***	-0.0096	-0.0169*	0.0055	-0.0180	-0.0180	-0.0204*	0.0074	-0.0119	-0.0158
Spouse post-secondary	0.0993*	-0.1129***	-0.0364**	-0.0090	-0.0230	-0.0345	-0.0224	0.0080	-0.0060	-0.0227	-0.0233	0.0098	0.0298
Spouse upper-secondary	0.0149	0.0116	-0.0112	-0.0235	-0.0360**	-0.0277**	-0.0040	-0.0306**	-0.0237*	-0.0199	-0.0280**	-0.0253*	-0.0147
Urban dummy	0.0255	0.0957***	0.1004***	0.0837**	0.0678***	-0.0047	-0.0122	-0.0082	-0.0278**	0.0057	-0.0114	0.1192***	0.0876***
Red River Delta	-0.0758**	-0.0202	-0.0520***	-0.0065	-0.0063	-0.0424***	-0.0396**	-0.0358**	-0.0904***	-0.0622***	-0.0772***	-0.0059	0.0442**
Northern and Coastal Central	-0.0213	-0.0160	-0.0720***	-0.0475***	-0.0419***	-0.0271	0.0180	0.0111	0.0524***	0.0699***	0.1193***	0.0311**	0.0651***
Central Highlands	0.0780	0.0287	-0.0674***	-0.0301	0.0343	0.0282	0.0502**	0.0426*	0.0183	0.0377*	0.0621***	0.0704***	0.1270***
Southeast	0.0758*	0.1151***	0.0928***	0.1555***	0.0641***	0.0265	-0.0449*	-0.0503**	0.0987***	0.1006***	0.1300***	0.2169***	0.2181***
Mekong River Delta	0.2215***	0.0852**	0.1500***	0.1225***	0.1470***	0.1049***	0.0848***	0.0255	0.0878***	0.1138***	0.1440***	-0.0081	0.0404**
Electric rice cooker	0.1526***	0.1451***	0.0943***	0.0842***	0.0847***	0.0806***	0.0101	0.0620***	0.0346***	0.0721***	0.0048	0.0111	0.0493***
Electric water pump	0.1368***	0.0986***	0.0617***	0.0562***	0.0630***	0.0654***	0.0342***	0.0372***	0.0332***	0.0155*	0.0010	0.0137	0.0215**
Village with car-accessible road	-0.0958**	-0.0245	-0.0352***	-0.0178	-0.0355	-0.0097	-0.0131	-0.0784***	-0.0665**	-0.1025**	0.0016	0.0598	-0.0580
Village with an all-weather passable road	0.0768**	-0.0482	0.0604***	-0.0128	-0.0106	-0.0050	0.0124	0.0349*	0.0243	0.0324	0.0056	-0.0338	0.0812
Nighttime light density of district	0.0020*	0.0005	0.0029***	0.0020***	0.0022***	0.0024***	0.0063***	0.0050***	0.0056***	0.0036***	0.0051***	0.0012***	0.0012***
PC computer		0.1028**	0.0683***	0.0651***	0.0395**	0.0744***	0.0594***	0.0827***	0.0790***	0.0905***	0.0648***	0.1011***	0.1248***
Electric water heater		0.0589	0.0708***	0.0903***	0.0551***	0.0840***	0.0943***	0.0759***	0.0755***	0.0609***	0.0600***	0.0514***	0.0705***

Predictor variables	VLSS 1993	VLSS 1998	VHLSS 2002	VHLSS 2004	VHLSS 2006	VHLSS 2008	VHLSS 2010	VHLSS 2012	VHLSS 2014	VHLSS 2016	VHLSS 2018	VHLSS 2020	VHLSS 2022
Telephone		0.1212***	0.1339***	0.1089***	0.1018***	0.0933***	0.1079***	0.1002***	0.0609***	0.0810***	0.0098	0.0279	0.0888***
Distance from village to nearest town (km)		0.0020*	0.0013***	0.0005	0.0006	0.0009**	0.0014**	0.0002	0.0004	0.0011**	-0.0009*	0.0001	0.0005
Constant	7.7952***	8.1398***	8.0892***	8.0591***	8.1522***	8.1055***	8.5144***	8.6731***	8.2841***	8.4243***	8.0623***	7.9744***	8.2685***
Observations	4,799	5,999	29,530	9,176	9,178	9,183	9,399	9,399	9,399	9,399	9,396	9,389	9,398
R-squared	0.622	0.773	0.754	0.763	0.749	0.721	0.745	0.728	0.724	0.738	0.731	0.732	0.696
Number of clusters	300	370	2,901	3,056	3,058	3,058	3,132	3,133	3,132	3,133	3,131	3,062	3,086
Sigma u	0.135	0.124	0.160	0.150	0.157	0.150	0.183	0.183	0.182	0.171	0.177	0.176	0.187
Sigma e	0.321	0.272	0.261	0.270	0.273	0.289	0.282	0.275	0.278	0.280	0.289	0.291	0.307
rho	0.150	0.171	0.273	0.236	0.249	0.212	0.297	0.307	0.300	0.272	0.273	0.269	0.272

*** p<0.01, ** p<0.05, * p<0.1. The standard errors are clustered at the village level.

Table A.7. Regression of log of real per capita consumption: Model 2

Predictor variables	VLSS 1993	VLSS 1998	VHLSS 2002	VHLSS 2004	VHLSS 2006	VHLSS 2008	VHLSS 2010	VHLSS 2012	VHLSS 2014	VHLSS 2016	VHLSS 2018	VHLSS 2020	VHLSS 2022
Ethnic minorities	-0.1133***	-0.0859***	-0.0699***	-0.1064***	-0.1109***	-0.0857***	-0.1348***	-0.0890***	-0.1281***	-0.0979***	-0.1008***	-0.0861***	-0.1412***
Household size	-0.0282***	-0.0497***	-0.0470***	-0.0438***	-0.0452***	-0.0542***	-0.0676***	-0.0593***	-0.0554***	-0.0659***	-0.0543***	-0.0571***	-0.0737***
Proportion of children	-0.2837***	-0.2796***	-0.3757***	-0.3802***	-0.3507***	-0.3448***	-0.3146***	-0.3196***	-0.2753***	-0.2822***	-0.3106***	-0.2588***	-0.2680***
Proportion of females	-0.0492*	-0.0748***	-0.0484***	-0.0766***	-0.0367**	-0.0564***	-0.0567***	-0.0884***	-0.0380**	-0.0633***	-0.0769***	-0.0446***	-0.0095
Proportion of elderly	-0.1712***	-0.0930***	-0.1256***	-0.1154***	-0.1299***	-0.0989***	-0.0952***	-0.0895***	-0.1014***	-0.0663***	-0.1111***	-0.0314*	-0.0070
Ratio of upper secondary	0.2443***	0.1491***	0.1927***	0.1926***	0.1984***	0.1630***	0.1597***	0.1737***	0.1761***	0.1282***	0.1478***	0.1752***	0.1352***
Ratio of post-secondary	0.1684**	0.2514***	0.3517***	0.3198***	0.4144***	0.4019***	0.3619***	0.3330***	0.3385***	0.2983***	0.3219***	0.3249***	0.3077***
Male household head	0.0023	0.0202*	0.0162***	0.0173	0.0368***	0.0149	0.0118	0.0181*	0.0259**	0.0276***	0.0077	0.0159	0.0133
Household head age	-0.0003	-0.0014***	-0.0007***	-0.0005	-0.0004	-0.0005	-0.0012***	-0.0019***	-0.0013***	-0.0015***	-0.0015***	-0.0024***	-0.0025***
Living with spouse	0.0254	-0.0137	-0.0168***	-0.0366***	-0.0402***	-0.0344***	-0.0143	-0.0530***	-0.0414***	-0.0650***	-0.0446***	-0.0598***	-0.0607***
Head is leader	0.1144***	0.0573**	0.0570***	0.0858***	0.0855***	0.0734***	0.0668***	0.1393***	0.1205***	0.1158***	0.2310***	0.1699***	0.2174***
Head is professional	0.0650**	0.0718***	0.0589***	0.0410**	0.0601***	0.0398**	0.0496***	0.0369**	0.0512***	0.0754***	0.0369**	0.0374**	0.0401**
Stereos	0.2264***	0.1477***	0.1184***	0.1177***	0.1078***	0.0968***	0.0774***	0.0719***	0.0676***	0.0952***	0.1234***	0.0682***	0.1284***
Motorbike	0.3871***	0.2984***	0.2612***	0.2313***	0.2171***	0.2175***	0.2000***	0.1765***	0.1531***	0.1855***	0.1170***	0.1312***	0.1317***
Washing machine	0.2802***	0.0679**	0.0776***	0.0909***	0.0829***	0.0987***	0.0652***	0.0763***	0.0522***	0.0801***	0.0887***	0.1008***	0.1107***
Fridge	0.1929***	0.1838***	0.1638***	0.1589***	0.1464***	0.1252***	0.1215***	0.1117***	0.0803***	0.0791***	0.0548***	0.0500***	0.0942***
Air conditioner	0.3066**	0.2246***	0.1653***	0.2082***	0.1955***	0.2297***	0.1974***	0.1419***	0.1416***	0.1425***	0.0879***	0.0948***	0.0953***
Log living area	0.2239***	0.1900***	0.1548***	0.1830***	0.1848***	0.1521***	0.2314***	0.2299***	0.2327***	0.2153***	0.2413***	0.2384***	0.2284***
Tap water	0.0648*	0.0935***	0.0732***	0.1048***	0.0586***	-0.0026	0.0553***	0.0630***	0.0593***	0.0511***	0.0288	0.0886***	0.0461*
Clean water	0.0021	0.0199*	0.0203***	0.0176	0.0025	0.0027	0.0313**	0.0323**	0.0255*	0.0247*	0.0184	0.0474*	0.0014
Flush latrine	0.1139***	0.0933***	0.1133***	0.1126***	0.1176***	0.0808***	0.0862***	0.0860***	0.0821***	0.0937***	0.0994***	0.0979***	0.0757***
Log utility consumption	0.0399***	0.0535***	0.0483***	0.0523***	0.0658***	0.0806***	0.0752***	0.0787***	0.0931***	0.1147***	0.1333***	0.1563***	0.1306***
Log education and health consumption	0.1140***	0.1136***	0.1068***	0.1093***	0.0908***	0.1042***	0.0663***	0.0623***	0.0839***	0.0678***	0.0895***	0.0766***	0.0487***
Nighttime light density of district	0.0025***	0.0034***	0.0050***	0.0034***	0.0027***	0.0020***	0.0050***	0.0040***	0.0050***	0.0034***	0.0052***	0.0019***	0.0018***
PC computer		0.1234***	0.0747***	0.0900***	0.0528***	0.0757***	0.0591***	0.0814***	0.0858***	0.0938***	0.0757***	0.1080***	0.1295***
Electric water heater		0.0889***	0.0783***	0.0658***	0.0396**	0.0627***	0.0883***	0.0727***	0.0366***	0.0180*	0.0022	0.0341***	0.0514***
Constant	7.7747***	8.0390***	8.0255***	7.9779***	8.0347***	8.0089***	8.5363***	8.6262***	8.2783***	8.4390***	8.1036***	8.0506***	8.4647***
Observations	4,799	5,999	29,530	9,176	9,178	9,183	9,399	9,399	9,399	9,399	9,396	9,389	9,398
R-squared	0.583	0.746	0.718	0.739	0.726	0.705	0.737	0.720	0.713	0.725	0.717	0.716	0.684
Number of clusters	300	370	2,901	3,056	3,058	3,058	3,132	3,133	3,132	3,133	3,131	3,062	3,086
Sigma u	0.150	0.136	0.179	0.168	0.174	0.158	0.190	0.188	0.190	0.182	0.188	0.189	0.196
Sigma e	0.324	0.279	0.267	0.275	0.278	0.294	0.284	0.277	0.281	0.281	0.290	0.291	0.307
rho	0.176	0.193	0.310	0.272	0.283	0.225	0.309	0.315	0.313	0.294	0.296	0.296	0.289

*** p<0.01, ** p<0.05, * p<0.1. The standard errors are clustered at the village level.

Table A.8. Regression of log of real per capita consumption: Model 3

Predictor variables	VLSS 1993	VLSS 1998	VHLSS 2002	VHLSS 2004	VHLSS 2006	VHLSS 2008	VHLSS 2010	VHLSS 2012	VHLSS 2014	VHLSS 2016	VHLSS 2018	VHLSS 2020	VHLSS 2022
Ethnic minorities	-0.2054***	-0.2258***	-0.1867***	-0.2503***	-0.2474***	-0.2349***	-0.2513***	-0.2042***	-0.2552***	-0.2015***	-0.2452***	-0.2188***	-0.2497***
Household size	-0.0249***	-0.0461***	-0.0448***	-0.0474***	-0.0477***	-0.0622***	-0.0704***	-0.0647***	-0.0645***	-0.0793***	-0.0692***	-0.0765***	-0.0899***
Proportion of children	-0.2301***	-0.2387***	-0.3526***	-0.3562***	-0.3265***	-0.3465***	-0.3024***	-0.3127***	-0.2579***	-0.2540***	-0.2865***	-0.2447***	-0.2580***
Proportion of females	-0.0480	-0.0564**	-0.0445***	-0.0598***	-0.0264	-0.0472**	-0.0370**	-0.0830***	-0.0083	-0.0303	-0.0465**	-0.0130	0.0023
Proportion of elderly	-0.1745***	-0.1344***	-0.1643***	-0.1367***	-0.1611***	-0.1014***	-0.1140***	-0.0986***	-0.1095***	-0.0538***	-0.1298***	-0.0306*	-0.0227
Ratio of upper secondary	0.3291***	0.2554***	0.2995***	0.3066***	0.3050***	0.2792***	0.2315***	0.2298***	0.2512***	0.1710***	0.1897***	0.2123***	0.1623***
Ratio of post-secondary	0.2904***	0.2708***	0.3840***	0.3558***	0.4360***	0.4538***	0.3651***	0.3304***	0.3470***	0.2780***	0.3057***	0.3088***	0.2846***
Male household head	-0.0264	-0.0110	0.0005	-0.0004	0.0292**	0.0078	0.0026	0.0066	0.0160	0.0170	-0.0030	0.0063	0.0046
Household head age	0.0007	-0.0010**	-0.0001	0.0002	-0.0002	-0.0008*	-0.0009**	-0.0015***	-0.0014***	-0.0016***	-0.0012***	-0.0021***	-0.0022***
Living with spouse	0.0543***	0.0350**	0.0161**	-0.0002	-0.0200	-0.0177	0.0037	-0.0276**	-0.0190	-0.0424***	-0.0180	-0.0418***	-0.0456***
Head is leader	0.1773***	0.0751**	0.0841***	0.0921***	0.0934***	0.1002***	0.0917***	0.1592***	0.1403***	0.1272***	0.2811***	0.2026***	0.2706***
Head is professional	0.0693**	0.0904***	0.0803***	0.0628***	0.0796***	0.0571***	0.0666***	0.0433**	0.0669***	0.0812***	0.0666***	0.0487***	0.0536***
Stereos	0.2439***	0.1709***	0.1291***	0.1448***	0.1316***	0.1237***	0.0917***	0.0855***	0.0800***	0.1049***	0.1369***	0.0834***	0.1442***
Motorbike	0.4184***	0.3418***	0.2997***	0.2693***	0.2499***	0.2518***	0.2276***	0.2063***	0.1775***	0.2180***	0.1277***	0.1570***	0.1449***
Washing machine	0.3214***	0.0850***	0.0899***	0.0955***	0.1096***	0.1072***	0.0757***	0.0858***	0.0728***	0.0951***	0.1097***	0.1403***	0.1399***
Fridge	0.2056***	0.2222***	0.2045***	0.1986***	0.1924***	0.1792***	0.1780***	0.1721***	0.1526***	0.1624***	0.1511***	0.1619***	0.1858***
Air conditioner	0.3680**	0.2432***	0.1756***	0.2390***	0.2312***	0.2916***	0.2138***	0.1651***	0.1644***	0.1741***	0.1267***	0.1486***	0.1314***
Log living area	0.2560***	0.2389***	0.1901***	0.2080***	0.2160***	0.1703***	0.2593***	0.2541***	0.2603***	0.2413***	0.2784***	0.2677***	0.2552***
Tap water	0.1420***	0.1695***	0.1527***	0.1874***	0.1674***	0.1118***	0.1699***	0.1611***	0.1686***	0.1907***	0.1716***	0.2404***	0.1302***
Clean water	0.0544***	0.0660***	0.0749***	0.0783***	0.0837***	0.0778***	0.1140***	0.1102***	0.1178***	0.1349***	0.1269***	0.1559***	0.0436
Flush latrine	0.1355***	0.1417***	0.1429***	0.1465***	0.1467***	0.1160***	0.1071***	0.1132***	0.1034***	0.1291***	0.1623***	0.1534***	0.1245***
Nighttime light density of district	0.0065***	0.0066***	0.0069***	0.0047***	0.0037***	0.0032***	0.0060***	0.0050***	0.0066***	0.0046***	0.0071***	0.0023***	0.0023***
PC computer		0.1218**	0.1172***	0.1283***	0.0817***	0.1073***	0.0918***	0.1102***	0.1188***	0.1332***	0.1195***	0.1578***	0.1715***
Electric water heater		0.0737*	0.0710***	0.0624***	0.0258	0.0686***	0.0920***	0.0828***	0.0418***	0.0267**	0.0153	0.0584***	0.0788***
Constant	8.3195***	8.7376***	8.7140***	8.7636***	8.7753***	9.0270***	9.1825***	9.2955***	9.1988***	9.3870***	9.2679***	9.3087***	9.4265***
Observations	4,799	5,999	29,530	9,176	9,178	9,183	9,399	9,399	9,399	9,399	9,396	9,389	9,398
R-squared	0.452	0.665	0.656	0.671	0.663	0.635	0.700	0.684	0.662	0.680	0.658	0.660	0.641
Number of clusters	300	370	2,901	3,056	3,058	3,058	3,132	3,133	3,132	3,133	3,131	3,062	3,086
Sigma u	0.219	0.165	0.192	0.188	0.190	0.183	0.197	0.190	0.204	0.195	0.205	0.206	0.213
Sigma e	0.353	0.313	0.300	0.309	0.309	0.323	0.307	0.302	0.307	0.305	0.319	0.315	0.324
rho	0.279	0.218	0.292	0.272	0.275	0.243	0.292	0.284	0.306	0.290	0.291	0.300	0.303

*** p<0.01, ** p<0.05, * p<0.1. The standard errors are clustered at the village level.

Table A.9. Regression of log of real per capita consumption: Model 4

Predictor variables	VLSS 1993	VLSS 1998	VHLSS 2002	VHLSS 2004	VHLSS 2006	VHLSS 2008	VHLSS 2010	VHLSS 2012	VHLSS 2014	VHLSS 2016	VHLSS 2018	VHLSS 2020	VHLSS 2022
Ethnic minorities	-0.2174***	-0.2497***	-0.2098***	-0.2732***	-0.2646***	-0.2493***	-0.2817***	-0.2318***	-0.2952***	-0.2302***	-0.2945***	-0.2401***	-0.2668***
Household size	-0.0255***	-0.0485***	-0.0458***	-0.0487***	-0.0493***	-0.0636***	-0.0735***	-0.0675***	-0.0640***	-0.0803***	-0.0701***	-0.0778***	-0.0911***
Proportion of children	-0.2388***	-0.2556***	-0.3587***	-0.3661***	-0.3303***	-0.3494***	-0.3246***	-0.3256***	-0.2740***	-0.2699***	-0.3178***	-0.2576***	-0.2722***
Proportion of females	-0.0465	-0.0562**	-0.0452***	-0.0594***	-0.0305	-0.0486**	-0.0422**	-0.0828***	-0.0120	-0.0333*	-0.0513**	-0.0178	0.0009
Proportion of elderly	-0.1736***	-0.1328***	-0.1651***	-0.1324***	-0.1568***	-0.1002***	-0.1076***	-0.0933***	-0.1094***	-0.0457***	-0.1150***	-0.0239	-0.0105
Ratio of upper secondary	0.3394***	0.2607***	0.3087***	0.3155***	0.3133***	0.2829***	0.2286***	0.2305***	0.2611***	0.1800***	0.2057***	0.2199***	0.1737***
Ratio of post-secondary	0.3006***	0.2896***	0.4020***	0.3816***	0.4479***	0.4750***	0.3836***	0.3463***	0.3797***	0.2931***	0.3413***	0.3334***	0.3289***
Male household head	-0.0303*	-0.0161	-0.0033	-0.0057	0.0244**	0.0046	-0.0026	0.0018	0.0058	0.0118	-0.0091	0.0019	0.0016
Household head age	0.0007	-0.0009**	-0.0000	0.0002	-0.0001	-0.0007*	-0.0010***	-0.0016***	-0.0016***	-0.0017***	-0.0015***	-0.0023***	-0.0024***
Living with spouse	0.0543***	0.0329**	0.0152**	-0.0015	-0.0210	-0.0197	-0.0049	-0.0376***	-0.0223*	-0.0517***	-0.0310**	-0.0481***	-0.0545***
Head is leader	0.1744***	0.0637**	0.0730***	0.0761***	0.0838***	0.0917***	0.0745***	0.1422***	0.1331***	0.1197***	0.2746***	0.1963***	0.2709***
Head is professional	0.0673**	0.0844***	0.0731***	0.0565***	0.0773***	0.0543***	0.0642***	0.0442**	0.0645***	0.0792***	0.0728***	0.0478***	0.0562***
Stereos	0.2478***	0.1700***	0.1303***	0.1453***	0.1296***	0.1220***	0.0914***	0.0805***	0.0761***	0.1021***	0.1395***	0.0833***	0.1435***
Motorbike	0.4219***	0.3451***	0.3016***	0.2725***	0.2522***	0.2542***	0.2299***	0.2119***	0.1618***	0.2166***	0.1263***	0.1602***	0.1488***
Washing machine	0.3290***	0.0897***	0.1006***	0.1040***	0.1292***	0.1220***	0.1033***	0.1010***	0.0864***	0.1115***	0.1260***	0.1466***	0.1468***
Fridge	0.2190***	0.2480***	0.2132***	0.2136***	0.2014***	0.1856***	0.1830***	0.1768***	0.1479***	0.1656***	0.1536***	0.1623***	0.1858***
Air conditioner	0.3765**	0.2628***	0.1826***	0.2637***	0.2522***	0.3128***	0.2571***	0.2067***	0.2087***	0.2026***	0.1627***	0.1617***	0.1459***
Log living area	0.2487***	0.2238***	0.1848***	0.1976***	0.2067***	0.1626***	0.2434***	0.2388***	0.2499***	0.2298***	0.2616***	0.2574***	0.2429***
Tap water	0.1997***	0.2306***	0.1927***	0.2290***	0.1966***	0.1362***	0.2294***	0.2164***	0.2381***	0.2353***	0.2316***	0.2689***	0.1629***
Clean water	0.0604***	0.0698***	0.0788***	0.0803***	0.0852***	0.0788***	0.1246***	0.1173***	0.1266***	0.1410***	0.1293***	0.1554***	0.0463
Flush latrine	0.1737***	0.1923***	0.1673***	0.1746***	0.1681***	0.1320***	0.1334***	0.1355***	0.1289***	0.1424***	0.1823***	0.1602***	0.1321***
PC computer		0.1393***	0.1263***	0.1440***	0.0880***	0.1123***	0.0981***	0.1177***	0.1208***	0.1372***	0.1224***	0.1642***	0.1754***
Electric water heater		0.0682*	0.0794***	0.0719***	0.0283	0.0688***	0.0869***	0.0835***	0.0397***	0.0217**	0.0035	0.0508***	0.0685***
Constant	8.3694***	8.8415***	8.7890***	8.8381***	8.8360***	9.0786***	9.3003***	9.3953***	9.3206***	9.4857***	9.4404***	9.3867***	9.5095***
Observations	4,799	5,999	29,530	9,176	9,178	9,183	9,399	9,399	9,399	9,399	9,396	9,389	9,398
R-squared	0.446	0.656	0.646	0.665	0.659	0.632	0.689	0.676	0.644	0.671	0.637	0.643	0.625
Number of clusters	300	370	2,901	3,056	3,058	3,058	3,132	3,133	3,132	3,133	3,131	3,062	3,086
Sigma u	0.219	0.166	0.194	0.191	0.192	0.184	0.205	0.194	0.216	0.200	0.219	0.217	0.222
Sigma e	0.353	0.313	0.300	0.309	0.309	0.323	0.307	0.302	0.307	0.305	0.319	0.315	0.324
rho	0.278	0.220	0.297	0.277	0.280	0.246	0.308	0.292	0.331	0.302	0.320	0.321	0.320

*** p<0.01, ** p<0.05, * p<0.1. The standard errors are clustered at the village level.

Table A.10. Regression of log of real per capita consumption: Model 5

Predictor variables	VLSS 1993	VLSS 1998	VHLSS 2002	VHLSS 2004	VHLSS 2006	VHLSS 2008	VHLSS 2010	VHLSS 2012	VHLSS 2014	VHLSS 2016	VHLSS 2018	VHLSS 2020	VHLSS 2022
Ethnic minorities	-0.2170***	-0.2991***	-0.2328***	-0.3274***	-0.3203***	-0.3039***	-0.3708***	-0.3295***	-0.4014***	-0.3318***	-0.3806***	-0.3039***	-0.3170***
Household size	-0.0476***	-0.0743***	-0.0701***	-0.0735***	-0.0811***	-0.0911***	-0.1122***	-0.1088***	-0.1089***	-0.1230***	-0.1175***	-0.1244***	-0.1375***
Proportion of children	-0.3586***	-0.3630***	-0.4218***	-0.4521***	-0.4028***	-0.4103***	-0.4167***	-0.4106***	-0.3550***	-0.3662***	-0.4142***	-0.3431***	-0.3307***
Proportion of females	-0.0336	-0.0471*	-0.0349***	-0.0505**	-0.0223	-0.0348*	-0.0268	-0.0620***	0.0251	-0.0164	-0.0168	-0.0107	0.0137
Proportion of elderly	-0.0834**	-0.0643**	-0.1190***	-0.0783***	-0.1065***	-0.0681***	-0.0738***	-0.0581***	-0.0798***	-0.0124	-0.0877***	0.0114	0.0169
Ratio of upper secondary	0.4000***	0.3424***	0.3657***	0.3954***	0.3744***	0.3127***	0.2635***	0.2584***	0.2926***	0.2127***	0.2409***	0.2392***	0.1921***
Ratio of post-secondary	0.3923***	0.3349***	0.4669***	0.4841***	0.5215***	0.5303***	0.4557***	0.4048***	0.4290***	0.3393***	0.4155***	0.3948***	0.3862***
Male household head	-0.0169	-0.0099	0.0024	-0.0073	0.0198	0.0003	0.0064	0.0110	0.0175	0.0246**	0.0059	0.0079	0.0150
Household head age	0.0011*	-0.0004	0.0003	0.0006	0.0004	-0.0003	0.0003	-0.0006	-0.0005	-0.0008*	-0.0006	-0.0012***	-0.0014***
Living with spouse	0.0346*	0.0117	0.0035	-0.0099	-0.0280**	-0.0261*	-0.0249*	-0.0595***	-0.0396***	-0.0740***	-0.0524***	-0.0767***	-0.0792***
Head is leader	0.1974***	0.1040***	0.0906***	0.0783***	0.0824***	0.0937***	0.0765**	0.1686***	0.1673***	0.1278***	0.2812***	0.2347***	0.3001***
Head is professional	0.1013***	0.1024***	0.0889***	0.0705***	0.0859***	0.0569***	0.0641***	0.0468**	0.0888***	0.0974***	0.0912***	0.0623***	0.0666***
Stereos	0.2820***	0.1888***	0.1582***	0.1763***	0.1592***	0.1423***	0.1207***	0.1099***	0.1110***	0.1301***	0.1718***	0.1210***	0.1738***
Motorbike	0.5031***	0.4100***	0.3542***	0.3268***	0.3043***	0.2905***	0.2725***	0.2454***	0.1827***	0.2464***	0.1325***	0.1709***	0.1442***
Washing machine	0.4360***	0.1312***	0.1278***	0.1497***	0.1772***	0.1579***	0.1528***	0.1554***	0.1312***	0.1569***	0.1764***	0.1990***	0.1875***
Fridge	0.2948***	0.3557***	0.2919***	0.3131***	0.2981***	0.2548***	0.2686***	0.2626***	0.2243***	0.2492***	0.2323***	0.2450***	0.2438***
Air conditioner	0.4539***	0.3331***	0.2030***	0.2811***	0.2860***	0.3477***	0.3209***	0.2546***	0.2648***	0.2623***	0.2177***	0.2230***	0.2050***
PC computer		0.1408***	0.1430***	0.1686***	0.1186***	0.1327***	0.1244***	0.1462***	0.1520***	0.1663***	0.1384***	0.1872***	0.2026***
Electric water heater		0.1349***	0.1554***	0.1698***	0.1097***	0.1240***	0.1547***	0.1433***	0.0939***	0.0778***	0.0552***	0.1057***	0.1117***
Constant	9.0999***	9.5793***	9.4303***	9.5421***	9.6017***	9.7089***	10.2077***	10.3282***	10.3229***	10.4521***	10.5872***	10.5406***	10.5394***
Observations	4,799	5,999	29,530	9,176	9,178	9,183	9,399	9,399	9,399	9,399	9,396	9,389	9,398
R-squared	0.395	0.603	0.600	0.622	0.617	0.607	0.643	0.628	0.582	0.621	0.577	0.599	0.589
Number of clusters	300	370	2,901	3,056	3,058	3,058	3,132	3,133	3,132	3,133	3,131	3,062	3,086
Sigma u	0.224	0.170	0.204	0.201	0.202	0.188	0.212	0.206	0.235	0.213	0.235	0.218	0.224
Sigma e	0.368	0.330	0.314	0.325	0.326	0.334	0.332	0.324	0.330	0.327	0.345	0.344	0.346
rho	0.271	0.210	0.297	0.276	0.279	0.240	0.291	0.288	0.337	0.298	0.317	0.285	0.294

*** p<0.01, ** p<0.05, * p<0.1. The standard errors are clustered at the village level.

Table A.11. Regression of log of real per capita consumption: lasso regression

Predictor variables	VLSS 1993	VLSS 1998	VHLSS 2002	VHLSS 2004	VHLSS 2006	VHLSS 2008	VHLSS 2010	VHLSS 2012	VHLSS 2014	VHLSS 2016	VHLSS 2018	VHLSS 2020	VHLSS 2022
Ethnic minorities	-0.0713***	-0.0510***	-0.0476***	-0.0594***	-0.0542***	-0.0309**	-0.0756***	-0.0237*	-0.0513***	-0.0383***	-0.0373***	-0.0506***	-0.0842***
Household size	-0.0566***	-0.0715***	-0.0607***	-0.0588***	-0.0609***	-0.0698***	-0.0956***	-0.0921***	-0.0912***	-0.0935***	-0.0777***	-0.0755***	-0.0856***
Proportion of children	-0.3081***	-0.2629***	-0.3762***	-0.3617***	-0.3486***	-0.3215***	-0.3162***	-0.3220***	-0.2707***	-0.2763***	-0.2973***	-0.2555***	-0.2548***
Proportion of females	-0.0346	-0.0641***	-0.0476***	-0.0647***	-0.0273	-0.0515***	-0.0454***	-0.0764***	-0.0224	-0.0517***	-0.0638***	-0.0402**	0.0139
Proportion of elderly	-0.1233***	-0.0539***	-0.0888***	-0.0619***	-0.0795***	-0.0573***	-0.0552***	-0.0488***	-0.0536***	-0.0265*	-0.0935***	-0.0254*	-0.0087
Ratio of upper secondary	0.1077**	0.0517	0.1638***	0.2071***	0.2038***	0.1907***	0.1562***	0.1850***	0.1896***	0.1645***	0.1533***	0.1704***	0.1481***
Ratio of post-secondary	0.0996	0.3313***	0.3845***	0.4235***	0.4390***	0.4782***	0.3411***	0.3111***	0.3745***	0.2955***	0.3265***	0.2737***	0.2458***
Male household head	0.0165	0.0264**	0.0167***	0.0266**	0.0373***	0.0173	0.0144	0.0178*	0.0229**	0.0308***	0.0075	0.0307***	0.0257**
Household head age	-0.0008	-0.0015***	-0.0010***	-0.0008**	-0.0009***	-0.0010***	-0.0017***	-0.0024***	-0.0021***	-0.0021***	-0.0019***	-0.0026***	-0.0026***
Living with spouse	-0.0246	-0.0300*	-0.0721***	-0.1041***	-0.0891***	-0.0068	-0.0541**	-0.1079***	-0.1088***	-0.1129***	-0.1017***	-0.0704***	-0.0945***
Head is leader	0.0639	0.0378	0.0450***	0.0927***	0.0742***	0.0726***	0.0758***	0.1261***	0.1444***	0.0970***	0.1978***	0.1591***	0.2069***
Head is professional	0.0682**	0.0472**	0.0491***	0.0424**	0.0568***	0.0443**	0.0598***	0.0354**	0.0752***	0.0648***	0.0245	0.0354**	0.0328*
Stereos	0.2079***	0.1294***	0.0860***	0.0761***	0.0699***	0.0674***	0.0677***	0.0569***	0.0522***	0.0772***	0.1067***	0.0694***	0.1132***
PC computer		0.1015**	0.0696***	0.0589***	0.0395***	0.0743***	0.0469***	0.0776***	0.0668***	0.0818***	0.0568***	0.0890***	0.1144***
Motorbike	0.2824***	0.2272***	0.1963***	0.1677***	0.1666***	0.1706***	0.1502***	0.1257***	0.1130***	0.1377***	0.0952***	0.1046***	0.0941***
Washing machine	0.2939***	0.0520**	0.0686***	0.0949***	0.0776***	0.0982***	0.0630***	0.0671***	0.0470***	0.0736***	0.0766***	0.0715***	0.0849***
Water heater		0.0636*	0.0709***	0.0868***	0.0509***	0.0771***	0.0796***	0.0603***	0.0548***	0.0520***	0.0559***	0.0391***	0.0673***
Fridge	0.0916***	0.0879***	0.0869***	0.0917***	0.0909***	0.0806***	0.0828***	0.0743***	0.0556***	0.0538***	0.0412***	0.0461***	0.0655***
Air conditioner	0.1637	0.1742***	0.1666***	0.2116***	0.2160***	0.2404***	0.1900***	0.1319***	0.1328***	0.1367***	0.0922***	0.0937***	0.0933***
Log living area	0.1000***	0.0998***	0.0990***	0.1225***	0.1193***	0.1026***	0.1247***	0.1194***	0.1172***	0.1209***	0.1655***	0.1805***	0.1848***
Tap water	0.0613*	0.0628***	0.0498***	0.0694***	0.0213	-0.0142	0.0314**	0.0171	0.0319**		0.0030	0.0234	-0.0047
Clean water	0.0338*	0.0299***	0.0253***	0.0103	-0.0069	-0.0130	0.0111	-0.0090	-0.0051	-0.0162*		0.0119	-0.0335
Flush latrine	0.0361	0.0062	0.0530***	0.0457***	0.0642***	0.0419***	0.0576***	0.0548***	0.0469***	0.0696***	0.0810***	0.0586***	0.0406***
Log utility consumption	0.0289***	0.0325***	0.0306***	0.0317***	0.0429***	0.0560***	0.0571***	0.0503***	0.0638***	0.0879***	0.1132***	0.1250***	0.1162***
Log education and health consumption	0.0988***	0.1052***	0.1014***	0.1029***	0.0856***	0.0999***	0.0610***	0.0551***	0.0791***	0.0639***	0.0885***	0.0742***	0.0473***
Head post-secondary	-0.0733	-0.0189	-0.0422***	-0.1015***	-0.0373	-0.0631**	-0.0117	0.0102	-0.0547**				
Head upper-secondary	0.0548***	0.0298**	-0.0020	-0.0253**		-0.0211*	-0.0064	-0.0208*	-0.0211*	-0.0184	0.0115		-0.0193
Spouse post-secondary	0.0805	-0.1215***	-0.0683***	-0.0513*	-0.0536*	-0.0549*	-0.0398*	-0.0422*	-0.0466**	-0.0384*	-0.0553**		0.0420**
Spouse upper-secondary	0.0169	0.0026	-0.0226***	-0.0327**	-0.0424***	-0.0348**	-0.0105	-0.0354***	-0.0245*	-0.0218*	-0.0365***	-0.0206*	-0.0247*
Urban dummy	-0.0556	0.0710***	0.0900***	0.0715***	0.0605***	-0.0064	-0.0379***	-0.0377**	-0.0547***	-0.0218	-0.0316**	0.0758***	0.0865***
Red River Delta	-0.1648***	-0.0497*	-0.0519***	-0.0042	0.0025	-0.0343**	-0.1054***	-0.0922***	-0.1210***	-0.0903***	-0.1220***	-0.0601***	0.0077
Northern and Coastal Central	-0.0729**	-0.0024	-0.0748***	-0.0454***	-0.0401***	-0.0216	0.0351**	0.0368**	0.0781***	0.0876***	0.1208***	0.0063	0.0541***
Central Highlands	0.0280	0.0464	-0.0839***	-0.0451**	0.0219	0.0112	0.0305*	0.0344*	0.0074	0.0253	0.0304	0.0353*	0.1029***
Southeast	0.0815*	0.1594***	0.0490***	0.1057***	0.0234	-0.0132	-0.0419**	-0.0266	0.0600***	0.1006***	0.1065***	0.1316***	0.1647***
Mekong River Delta	0.1518***	0.0749***	0.1356***	0.1109***	0.1385***	0.0974***	0.1124***	0.0783***	0.1557***	0.1639***	0.1760***	-0.0062	0.0306*
Telephone		0.1018***	0.1118***	0.0793***	0.0782***	0.0769***	0.0885***	0.0810***	0.0746***	0.0715***	0.0306**	0.0303*	0.0764***
Electric water pump		0.1124***	0.0614***	0.0468***	0.0535***	0.0536***	-0.0160*	0.0186*	0.0210**	0.0450***		-0.0136	0.0366***

Predictor variables	VLSS 1993	VLSS 1998	VHLSS 2002	VHLSS 2004	VHLSS 2006	VHLSS 2008	VHLSS 2010	VHLSS 2012	VHLSS 2014	VHLSS 2016	VHLSS 2018	VHLSS 2020	VHLSS 2022
Electric water pump	0.0959***	0.0690***	0.0463***	0.0440***	0.0521***	0.0557***	0.0127	0.0140*	0.0098	-0.0027	-0.0134	-0.0075	0.0086
Village with car-accessible road	-0.1215***	-0.0240	-0.0381***	-0.0169	-0.0188	-0.0205	-0.0159	-0.0770***	-0.0538**	-0.1083***	0.0295	0.0751*	-0.0591
Village with an all-weather passable road	0.0664**	-0.0624**	0.0409**	-0.0092	-0.0215		0.0051	0.0185	-0.0062	0.0372	-0.0171	-0.0662**	0.0728*
Distance to nearest town		0.0016*	0.0012***	0.0006	0.0008	0.0008*	0.0013***	0.0005	0.0009**	0.0015***	-0.0003	0.0007	0.0007
Hanoi capital dummy	0.1290***	0.0282	0.0110	-0.0051	-0.0600***	-0.0129	0.2116***	0.1248***	0.1459***	0.1209***	0.2294***	0.1445***	0.1174***
HCM city	-0.0989*	-0.0875*	0.1521***	0.1164***	0.0654**	0.0790***	0.1079***		0.2560***	0.0585**	0.0939***	0.1382***	0.0436
Log of housing value	0.0828***	0.0645***	0.0284***	0.0238***	0.0328***	0.0230***	0.1063***	0.1283***	0.1442***	0.1167***	0.0954***	0.0968***	0.0754***
Color television	0.1467***	0.0998***	0.1125***	0.1161***	0.0920***	0.0868***	-0.0057	0.0168	-0.0471***	-0.0123	-0.0299**	0.0016	-0.0035
Village with periodic market	-0.0911***	0.0677***	0.0211**	0.0086	0.0152	-0.0072	-0.0031	0.0178	0.0157	0.0182	-0.0067	0.0084	0.0112
Radio	0.1403***	0.0647***	0.0434***	0.0287***	0.0491***	0.0434***	0.0337**	0.0234		-0.0218			0.0522
Head is married	0.0367*	-0.0202	0.0458***	0.0639***	0.0367	-0.0461*	0.0249	0.0395*	0.0635***	0.0384	0.0631***		0.0306
Gas stove	0.1053***	0.0637***	0.0866***	0.1144***	0.1003***	0.1098***	0.0914***	0.0889***	0.0808***	0.0688***	0.0381***	0.0487***	0.0505***
Spouse is leader	-0.0060	0.1052**	0.0607**	0.0798*	0.0242	0.0240	0.1403***	0.1672***	0.0880**	0.1547***	0.1835***	0.1626***	0.1813***
Spouse is professional		0.0364	0.0512***	0.0668***	0.0543***	0.0319	0.0268	0.0536***	0.0499**	0.0326	0.0405*	0.0261	-0.0346
Nighttime light density of district		0.0002	0.0017***	0.0012***	0.0018***	0.0019***	0.0025***	0.0023***	0.0016***	0.0013***	0.0024***	0.0005***	0.0008***
Village with post office	-0.0297		-0.0024	-0.0126	-0.0281***	-0.0255**		-0.0191	-0.0140	-0.0186	0.0069	0.0075	-0.0228*
Constant	7.5028***	7.7254***	7.9824***	7.9666***	7.9621***	7.9916***	7.7755***	7.7172***	7.2252***	7.5527***	7.3389***	7.2827***	7.6504***
Observations	4,799	5,999	29,530	9,176	9,178	9,183	9,399	9,399	9,399	9,399	9,396	9,389	9,398
R-squared	0.663	0.794	0.767	0.774	0.760	0.730	0.779	0.763	0.767	0.763	0.757	0.760	0.728
Number of clusters	300	370	2,901	3,056	3,058	3,058	3,132	3,133	3,132	3,133	3,131	3,062	3,086
Sigma u	0.128	0.110	0.155	0.146	0.150	0.145	0.157	0.159	0.159	0.156	0.165	0.163	0.173
Sigma e	0.306	0.262	0.255	0.265	0.268	0.285	0.270	0.265	0.262	0.271	0.277	0.278	0.293
rho	0.148	0.150	0.269	0.234	0.238	0.205	0.253	0.264	0.269	0.249	0.261	0.255	0.259

*** p<0.01, ** p<0.05, * p<0.1. The standard errors are clustered at the village level.

Table A.12. Regression of log of real per capita consumption: rigorous lasso regression

Predictor variables	VLSS 1993	VLSS 1998	VHLSS 2002	VHLSS 2004	VHLSS 2006	VHLSS 2008	VHLSS 2010	VHLSS 2012	VHLSS 2014	VHLSS 2016	VHLSS 2018	VHLSS 2020	VHLSS 2022
Ethnic minorities	-0.0452*	-0.0378**	-0.0406***	-0.0550***	-0.0465***		-0.0779***	-0.0302**	-0.0546***	-0.0290**	-0.0399***	-0.0415***	-0.0980***
Household size	-0.0563***	-0.0740***	-0.0616***	-0.0602***	-0.0627***	-0.0712***	-0.0955***	-0.0890***	-0.0930***	-0.0928***	-0.0813***	-0.0745***	-0.0856***
Proportion of children	-0.2235***	-0.1836***	-0.3760***	-0.3653***	-0.3353***	-0.3189***	-0.3152***	-0.3369***	-0.2734***	-0.2907***	-0.2799***	-0.2570***	-0.2596***
Proportion of females		-0.0699***	-0.0458***				-0.0443***	-0.0868***			-0.0560***	-0.0585***	
Proportion of elderly			-0.0982***	-0.0967***	-0.1100***	-0.0935***	-0.0625***	-0.0559***	-0.0741***	-0.0372**	-0.1075***	-0.0298*	
Ratio of upper secondary	0.1337***	0.1148***	0.1534***	0.1631***	0.1761***	0.1481***	0.1450***	0.1374***	0.1498***	0.1273***	0.1497***	0.1556***	0.1094***
Ratio of post-secondary		0.1870***	0.3002***	0.2933***	0.3767***	0.4041***	0.3260***	0.2872***	0.3086***	0.2661***	0.3193***	0.2890***	0.2878***
Household head age			-0.0008***				-0.0014***	-0.0024***	-0.0015***	-0.0021***	-0.0016***	-0.0026***	-0.0028***
Living with spouse								-0.0632***		-0.0561***		-0.0538***	-0.0569***
Head is leader				0.0826***	0.0754***			0.1386***	0.1349***	0.1064***	0.1996***	0.1798***	0.1981***
Head is professional	0.0696**	0.0561***	0.0396***		0.0556***		0.0523***	0.0371**	0.0571***	0.0650***		0.0413***	
Stereos	0.2137***	0.1355***	0.0854***	0.0762***	0.0754***	0.0702***	0.0688***	0.0630***	0.0538***	0.0808***	0.1050***	0.0722***	0.1174***
PC computer		0.1048***	0.0715***	0.0627***	0.0417***	0.0765***	0.0501***	0.0803***	0.0691***	0.0810***	0.0619***	0.0944***	0.1183***
Motorbike	0.2906***	0.2340***	0.1975***	0.1680***	0.1688***	0.1752***	0.1494***	0.1272***	0.1132***	0.1460***	0.0966***	0.1133***	0.1026***
Washing machine		0.0523**	0.0636***	0.0929***	0.0781***	0.0957***	0.0558***	0.0619***	0.0430***	0.0713***	0.0852***	0.0734***	0.0888***
Water heater		0.0672**	0.0690***	0.0788***	0.0439***	0.0751***	0.0828***	0.0608***	0.0515***	0.0496***		0.0299***	0.0603***
Fridge	0.1052***	0.0817***	0.0859***	0.0898***	0.0869***	0.0809***	0.0814***	0.0718***	0.0558***	0.0520***	0.0384***	0.0462***	0.0598***
Air conditioner		0.1680***	0.1628***	0.2096***	0.2110***	0.2394***	0.1948***	0.1322***	0.1319***	0.1368***	0.1022***	0.0836***	0.0847***
Log living area	0.0850***	0.0940***	0.1036***	0.1273***	0.1248***	0.1089***	0.1309***	0.1263***	0.1250***	0.1248***	0.1708***	0.1857***	0.1848***
Tap water	0.0264	0.0354**	0.0322***	0.0589***	0.0257**			0.0124	0.0188**	0.0069			
Flush latrine	0.0272	0.0099	0.0530***	0.0441***	0.0638***	0.0361***	0.0566***	0.0524***	0.0454***	0.0681***	0.0829***	0.0562***	0.0427***
Log utility consumption	0.0291***	0.0323***	0.0305***	0.0309***	0.0414***	0.0531***	0.0531***	0.0491***	0.0570***	0.0847***	0.1133***	0.1222***	0.1160***
Log education and health consumption	0.0974***	0.1035***	0.1011***	0.1022***	0.0851***	0.1002***	0.0613***	0.0557***	0.0786***	0.0628***	0.0880***	0.0743***	0.0481***
Head post-secondary								0.0189		0.0061			
Head upper-secondary	0.0605***												
Urban dummy		0.0451**	0.0807***	0.0592***	0.0418***							0.0869***	0.0801***
Red River Delta	-0.0859***						-0.1150***	-0.0986***	-0.1102***	-0.0920***	-0.1203***		
Northern and Coastal Central			-0.0427***	-0.0420***	-0.0448***				0.0814***	0.0814***	0.1046***		
Central Highlands			-0.0661***	-0.0453***									
Southeast	0.0885***	0.1288***	0.0828***	0.1085***					0.0687***	0.0968***	0.0817***	0.1373***	0.1353***
Mekong River Delta	0.1924***	0.0862***	0.1622***	0.1204***	0.1422***	0.1178***	0.1006***	0.0676***	0.1632***	0.1559***	0.1561***		
Telephone		0.1048***	0.1116***	0.0785***	0.0741***	0.0736***	0.0892***	0.0855***	0.0696***	0.0728***			0.0762***
Electric water pump	0.1190***	0.1114***	0.0616***	0.0475***	0.0531***	0.0517***		0.0223**		0.0401***			0.0379***
Electric water pump	0.1059***	0.0701***	0.0465***	0.0431***	0.0508***	0.0561***							
Village with car-accessible road	-0.0349	0.0003	-0.0311***							-0.0857***			
Village with an all-weather passable road		-0.0682**											
Hanoi capital dummy							0.2284***	0.1460***	0.1629***	0.1248***	0.2212***	0.1053***	0.0971***

Predictor variables	VLSS 1993	VLSS 1998	VHLSS 2002	VHLSS 2004	VHLSS 2006	VHLSS 2008	VHLSS 2010	VHLSS 2012	VHLSS 2014	VHLSS 2016	VHLSS 2018	VHLSS 2020	VHLSS 2022
HCM city			0.1668***	0.1266***	0.1126***	0.1055***	0.0857***		0.2810***	0.0716***	0.1037***	0.1486***	
Log of housing value	0.0846***	0.0635***	0.0280***	0.0227***	0.0303***	0.0199***	0.1039***	0.1251***	0.1395***	0.1139***	0.0943***	0.0963***	0.0760***
Color television	0.1458***	0.1013***	0.1122***	0.1162***	0.0891***	0.0856***							
Village with periodic market	-0.0804***												
Radio	0.1460***	0.0666***	0.0435***	0.0295***	0.0508***	0.0414***							
Gas stove		0.0649***	0.0865***	0.1150***	0.1034***	0.1123***	0.0853***	0.0898***	0.0808***	0.0682***	0.0414***	0.0431***	0.0495***
Spouse is professional			0.0244***	0.0436**									
Nighttime light density of district			0.0014***	0.0012***	0.0014***	0.0015***	0.0016***	0.0013***	0.0008**	0.0008**	0.0022***	0.0005***	0.0009***
Constant	7.3893***	7.6812***	7.9663***	7.8925***	7.8957***	7.8776***	7.8041***	7.7192***	7.1945***	7.5978***	7.3276***	7.3557***	7.6943***
Observations	4,799	5,999	29,530	9,176	9,178	9,183	9,399	9,399	9,399	9,399	9,396	9,389	9,398
R-squared	0.651	0.788	0.766	0.772	0.757	0.727	0.776	0.760	0.763	0.760	0.754	0.758	0.725
Number of clusters	300	370	2,901	3,056	3,058	3,058	3,132	3,133	3,132	3,133	3,131	3,062	3,086
Sigma u	0.134	0.112	0.156	0.146	0.152	0.146	0.160	0.161	0.162	0.158	0.165	0.164	0.175
Sigma e	0.308	0.264	0.256	0.266	0.269	0.286	0.271	0.265	0.263	0.272	0.279	0.279	0.294
rho	0.160	0.153	0.269	0.232	0.241	0.208	0.259	0.270	0.275	0.253	0.259	0.258	0.261

*** p<0.01, ** p<0.05, * p<0.1. The standard errors are clustered at the village level.

Table A.13. Regression of log of real per capita consumption: elastic net regression

Predictor variables	VLSS 1993	VLSS 1998	VHLSS 2002	VHLSS 2004	VHLSS 2006	VHLSS 2008	VHLSS 2010	VHLSS 2012	VHLSS 2014	VHLSS 2016	VHLSS 2018	VHLSS 2020	VHLSS 2022
Ethnic minorities	-0.0737***	-0.0507***	-0.0405***	-0.0594***	-0.0542***	-0.0309**	-0.0777***	-0.0237*	-0.0513***	-0.0383***	-0.0374***	-0.0506***	-0.0843***
Household size	-0.0566***	-0.0716***	-0.0617***	-0.0588***	-0.0609***	-0.0698***	-0.0954***	-0.0921***	-0.0912***	-0.0935***	-0.0777***	-0.0755***	-0.0856***
Proportion of children	-0.3042***	-0.2629***	-0.3753***	-0.3617***	-0.3486***	-0.3214***	-0.3205***	-0.3220***	-0.2707***	-0.2763***	-0.2969***	-0.2555***	-0.2555***
Proportion of females	-0.0345	-0.0644***	-0.0457***	-0.0647***	-0.0273	-0.0516***	-0.0466***	-0.0764***	-0.0224	-0.0517***	-0.0638***	-0.0402**	0.0138
Proportion of elderly	-0.1277***	-0.0537***	-0.0981***	-0.0619***	-0.0795***	-0.0574***	-0.0573***	-0.0488***	-0.0536***	-0.0265*	-0.0933***	-0.0254*	-0.0091
Ratio of upper secondary	0.1072**	0.0527*	0.1561***	0.2071***	0.2038***	0.1907***	0.1424***	0.1850***	0.1896***	0.1645***	0.1537***	0.1704***	0.1473***
Ratio of post-secondary		0.2999***	0.3103***	0.4235***	0.4390***	0.4783***	0.3268***	0.3111***	0.3745***	0.2955***	0.3288***	0.2737***	0.2408***
Male household head	0.0074	0.0260**		0.0266**	0.0373***	0.0173	0.0156	0.0178*	0.0229**	0.0308***	0.0076	0.0307***	0.0257**
Household head age	-0.0006	-0.0015***	-0.0008***	-0.0008**	-0.0009***	-0.0010***	-0.0017***	-0.0024***	-0.0021***	-0.0021***	-0.0019***	-0.0026***	-0.0026***
Living with spouse		-0.0299*		-0.1041***	-0.0891***	-0.0067	-0.0354***	-0.1079***	-0.1088***	-0.1129***	-0.1017***	-0.0704***	-0.0946***
Head is leader	0.0652	0.0360		0.0927***	0.0742***	0.0726***	0.0725***	0.1261***	0.1444***	0.0970***	0.1985***	0.1591***	0.2051***
Head is professional	0.0688**	0.0449**	0.0438***	0.0424**	0.0568***	0.0443**	0.0573***	0.0354**	0.0752***	0.0648***	0.0254	0.0354**	0.0310
Stereos	0.2049***	0.1296***	0.0851***	0.0761***	0.0699***	0.0674***	0.0679***	0.0569***	0.0522***	0.0772***	0.1067***	0.0694***	0.1132***
PC computer		0.1023**	0.0723***	0.0589***	0.0395***	0.0743***	0.0470***	0.0776***	0.0668***	0.0818***	0.0568***	0.0890***	0.1144***
Motorbike	0.2839***	0.2272***	0.1981***	0.1677***	0.1666***	0.1706***	0.1502***	0.1257***	0.1130***	0.1377***	0.0951***	0.1046***	0.0942***
Washing machine	0.2975***	0.0517**	0.0640***	0.0949***	0.0776***	0.0982***	0.0621***	0.0671***	0.0470***	0.0736***	0.0766***	0.0715***	0.0849***
Water heater		0.0640**	0.0697***	0.0868***	0.0509***	0.0772***	0.0790***	0.0603***	0.0548***	0.0520***	0.0559***	0.0391***	0.0673***
Fridge	0.0938***	0.0880***	0.0860***	0.0917***	0.0909***	0.0806***	0.0826***	0.0743***	0.0556***	0.0538***	0.0412***	0.0461***	0.0655***
Air conditioner	0.1693	0.1733***	0.1636***	0.2116***	0.2160***	0.2404***	0.1893***	0.1319***	0.1328***	0.1367***	0.0922***	0.0937***	0.0933***
Log living area	0.1027***	0.0998***	0.1033***	0.1225***	0.1193***	0.1026***	0.1249***	0.1194***	0.1172***	0.1209***	0.1655***	0.1805***	0.1847***
Tap water	0.0261	0.0631***	0.0322***	0.0694***	0.0213	-0.0142	0.0213*	0.0171	0.0319**		0.0020	0.0234	-0.0047
Clean water		0.0298***		0.0103	-0.0069	-0.0130		-0.0090	-0.0051	-0.0162*	-0.0010	0.0119	-0.0335
Flush latrine	0.0341	0.0064	0.0532***	0.0457***	0.0642***	0.0418***	0.0579***	0.0548***	0.0469***	0.0696***	0.0810***	0.0586***	0.0406***
Log utility consumption	0.0285***	0.0325***	0.0305***	0.0317***	0.0429***	0.0559***	0.0574***	0.0503***	0.0638***	0.0879***	0.1132***	0.1250***	0.1162***
Log education and health consumption	0.0990***	0.1052***	0.1012***	0.1029***	0.0856***	0.0999***	0.0613***	0.0551***	0.0791***	0.0639***	0.0885***	0.0742***	0.0473***
Head post-secondary	-0.0450			-0.1015***	-0.0373	-0.0631**		0.0102	-0.0547**		-0.0026		0.0052
Head upper-secondary	0.0546***	0.0308**		-0.0253**		-0.0212*		-0.0208*	-0.0211*	-0.0184	0.0110		-0.0184
Spouse post-secondary	0.0964**	-0.1175***		-0.0513*	-0.0536*	-0.0549*	-0.0332	-0.0422*	-0.0466**	-0.0384*	-0.0554**		0.0424**
Spouse upper-secondary	0.0125			-0.0327**	-0.0424***	-0.0348**		-0.0354***	-0.0245*	-0.0218*	-0.0365***	-0.0206*	-0.0247*
Urban dummy		0.0729***	0.0806***	0.0715***	0.0605***	-0.0084	-0.0388***	-0.0377**	-0.0547***	-0.0218	-0.0316**	0.0758***	0.0865***
Red River Delta	-0.1674***	-0.0472**		-0.0042	0.0025	-0.0343**	-0.1031***	-0.0922***	-0.1210***	-0.0903***	-0.1220***	-0.0601***	0.0077
Northern and Coastal Central	-0.0691**		-0.0430***	-0.0454***	-0.0401***	-0.0215	0.0365**	0.0368**	0.0781***	0.0876***	0.1208***	0.0063	0.0541***
Central Highlands		0.0481	-0.0664***	-0.0451**	0.0219	0.0113	0.0311*	0.0344*	0.0074	0.0253	0.0305	0.0353*	0.1029***
Southeast	0.0760*	0.1617***	0.0822***	0.1057***	0.0234	-0.0132	-0.0402**	-0.0266	0.0600***	0.1006***	0.1065***	0.1316***	0.1647***
Mekong River Delta	0.1478***	0.0761***	0.1620***	0.1109***	0.1385***	0.0975***	0.1141***	0.0783***	0.1557***	0.1639***	0.1760***	-0.0062	0.0306*
Telephone		0.1019***	0.1112***	0.0793***	0.0782***	0.0769***	0.0890***	0.0810***	0.0746***	0.0715***	0.0305**	0.0303*	0.0765***
Electric water pump	0.1041***	0.1122***	0.0615***	0.0468***	0.0535***	0.0536***	-0.0151	0.0186*	0.0210**	0.0450***	0.0004	-0.0136	0.0366***

Predictor variables	VLSS 1993	VLSS 1998	VHLSS 2002	VHLSS 2004	VHLSS 2006	VHLSS 2008	VHLSS 2010	VHLSS 2012	VHLSS 2014	VHLSS 2016	VHLSS 2018	VHLSS 2020	VHLSS 2022
Electric water pump	0.0952***	0.0690***	0.0465***	0.0440***	0.0521***	0.0557***	0.0137*	0.0140*	0.0098	-0.0027	-0.0134	-0.0075	0.0086
Village with car-accessible road	-0.0933***	-0.0246	-0.0313***	-0.0169	-0.0188	-0.0229	-0.0114	-0.0770***	-0.0538**	-0.1083***	0.0296	0.0751*	-0.0591
Village with an all-weather passable road	0.0742**	-0.0631**		-0.0092	-0.0215	0.0037		0.0185	-0.0062	0.0372	-0.0171	-0.0662**	0.0728*
Distance to nearest town		0.0016*		0.0006	0.0008	0.0008*	0.0013***	0.0005	0.0009**	0.0015***	-0.0003	0.0007	0.0007
Hanoi capital dummy	0.1334***	0.0316		-0.0051	-0.0600***	-0.0128	0.2108***	0.1248***	0.1459***	0.1209***	0.2294***	0.1445***	0.1175***
HCM city	-0.1037**	-0.0815**	0.1670***	0.1164***	0.0654**	0.0792***	0.1094***		0.2560***	0.0585**	0.0938***	0.1382***	0.0436
Log of housing value	0.0824***	0.0646***	0.0280***	0.0238***	0.0328***	0.0230***	0.1063***	0.1283***	0.1442***	0.1167***	0.0954***	0.0968***	0.0754***
Color television	0.1444***	0.0998***	0.1123***	0.1161***	0.0920***	0.0868***	-0.0055	0.0168	-0.0471***	-0.0123	-0.0300**	0.0016	-0.0035
Village with periodic market	-0.0931***	0.0682***		0.0086	0.0152	-0.0075	-0.0026	0.0178	0.0157	0.0182	-0.0067	0.0084	0.0111
Radio	0.1405***	0.0647***	0.0435***	0.0287***	0.0491***	0.0434***	0.0333**	0.0234		-0.0218			0.0520
Head is married	0.0230	-0.0200		0.0639***	0.0367	-0.0462*		0.0395*	0.0635***	0.0384	0.0631***		0.0305
Gas stove		0.0637***	0.0869***	0.1144***	0.1003***	0.1099***	0.0915***	0.0889***	0.0808***	0.0688***	0.0380***	0.0487***	0.0505***
Spouse is leader		0.1064**		0.0798*	0.0242	0.0239	0.1379***	0.1672***	0.0880**	0.1547***	0.1837***	0.1626***	0.1811***
Spouse is professional		0.0368		0.0668***	0.0543***	0.0319	0.0228	0.0536***	0.0499**	0.0326	0.0405*	0.0261	-0.0348*
Nighttime light density of district			0.0013***	0.0012***	0.0018***	0.0019***	0.0025***	0.0023***	0.0016***	0.0013***	0.0024***	0.0005***	0.0008***
Village with post office	-0.0291			-0.0126	-0.0281***	-0.0257**		-0.0191	-0.0140	-0.0186	0.0069	0.0075	-0.0228*
Constant	7.4866***	7.7248***	7.9672***	7.9666***	7.9621***	7.9909***	7.7843***	7.7172***	7.2252***	7.5527***	7.3395***	7.2827***	7.6502***
Observations	4,799	5,999	29,530	9,176	9,178	9,183	9,399	9,399	9,399	9,399	9,396	9,389	9,398
R-squared	0.663	0.794	0.766	0.774	0.760	0.730	0.779	0.763	0.767	0.763	0.757	0.760	0.728
Number of clusters	300	370	2,901	3,056	3,058	3,058	3,132	3,133	3,132	3,133	3,131	3,062	3,086
Sigma u	0.127	0.110	0.155	0.146	0.150	0.145	0.157	0.159	0.159	0.156	0.165	0.163	0.173
Sigma e	0.306	0.262	0.256	0.265	0.268	0.285	0.270	0.265	0.262	0.271	0.277	0.278	0.293
rho	0.146	0.149	0.269	0.234	0.238	0.205	0.253	0.264	0.269	0.249	0.261	0.255	0.259

*** p<0.01, ** p<0.05, * p<0.1. The standard errors are clustered at the village level.

Table A.14. Regression of log of real per capita consumption: forward stepwise regression

Predictor variables	VLSS 1993	VLSS 1998	VHLSS 2002	VHLSS 2004	VHLSS 2006	VHLSS 2008	VHLSS 2010	VHLSS 2012	VHLSS 2014	VHLSS 2016	VHLSS 2018	VHLSS 2020	VHLSS 2022
Ethnic minorities	-0.0722***		-0.0512***	-0.0611***	-0.0669***		-0.0791***	-0.0278**	-0.0606***	-0.0416***	-0.0481***	-0.0593***	-0.0953***
Household size	-0.0577***	-0.0737***	-0.0608***	-0.0605***	-0.0616***	-0.0694***	-0.0933***	-0.0904***	-0.0905***	-0.0922***	-0.0770***	-0.0747***	-0.0846***
Proportion of children	-0.2864***	-0.2546***	-0.3771***	-0.3527***	-0.3529***	-0.3378***	-0.3298***	-0.3272***	-0.2872***	-0.2909***	-0.3147***	-0.2615***	-0.2639***
Proportion of females		-0.0625***	-0.0531***	-0.0709***		-0.0568***	-0.0598***	-0.0902***		-0.0564***	-0.0687***	-0.0412**	
Proportion of elderly	-0.1513***	-0.0594***	-0.0880***	-0.0869***	-0.0824***	-0.0628***			-0.0603***		-0.0926***		
Ratio of upper secondary	0.1130***	0.0991***	0.1736***	0.1808***	0.2081***	0.1474***	0.1458***	0.1922***	0.1506***	0.1316***	0.1270***	0.1564***	0.1068***
Ratio of post-secondary		0.3213***	0.3644***	0.4138***	0.4007***	0.4109***	0.3099***	0.3068***	0.3485***	0.2788***	0.3108***	0.2841***	0.2860***
Male household head	0.0214*				0.0430***				0.0274***	0.0335***		0.0312***	
Household head age		-0.0014***	-0.0011***		-0.0010***	-0.0010***	-0.0023***	-0.0031***	-0.0020***	-0.0024***	-0.0020***	-0.0029***	-0.0028***
Living with spouse			-0.0638***	-0.0867***	-0.0588***	-0.0451***	-0.0307***	-0.0675***	-0.1148***	-0.0904***	-0.1120***	-0.0750***	-0.0594***
Head is leader				0.0852***	0.0686***	0.0595***	0.0746***	0.1314***	0.1418***	0.0979***	0.1913***	0.1631***	0.1985***
Head is professional	0.0661**	0.0532***			0.0588***		0.0610***	0.0451***	0.0778***	0.0671***		0.0411***	
Stereos	0.2117***	0.1362***	0.0856***	0.0760***	0.0732***	0.0673***	0.0692***	0.0587***	0.0544***	0.0779***	0.1067***	0.0714***	0.1176***
PC computer			0.0726***	0.0660***		0.0760***	0.0494***	0.0837***	0.0693***	0.0830***	0.0589***	0.0921***	0.1156***
Motorbike	0.2862***	0.2297***	0.1979***	0.1688***	0.1684***	0.1741***	0.1551***	0.1351***	0.1162***	0.1430***	0.1054***	0.1117***	0.1011***
Washing machine	0.2961***		0.0696***	0.0943***	0.0907***	0.1010***	0.0644***	0.0671***	0.0479***	0.0749***	0.0781***	0.0740***	0.0851***
Water heater		0.0795**	0.0726***	0.0868***	0.0530***	0.0773***	0.0801***	0.0594***	0.0542***	0.0500***	0.0535***	0.0402***	0.0585***
Fridge	0.0974***	0.0943***	0.0873***	0.0927***	0.0920***	0.0821***	0.0821***	0.0749***	0.0552***	0.0542***	0.0482***	0.0515***	0.0627***
Air conditioner		0.1913***	0.1639***	0.2133***	0.2207***	0.2409***	0.1969***	0.1402***	0.1370***	0.1381***	0.0936***	0.0903***	0.0937***
Log living area	0.0982***	0.1048***	0.0987***	0.1213***	0.1152***	0.1005***	0.1208***	0.1143***	0.1143***	0.1172***	0.1604***	0.1778***	0.1854***
Tap water		0.0660***	0.0350***	0.0658***			0.0257**	0.0318***			0.0117		
Clean water		0.0298***			-0.0229***				-0.0287***	-0.0199**			-0.0291***
Flush latrine	0.0407*		0.0557***	0.0487***	0.0705***	0.0425***	0.0609***	0.0569***	0.0503***	0.0707***	0.0852***	0.0624***	0.0414***
Log utility consumption	0.0290***	0.0322***	0.0312***	0.0316***	0.0438***	0.0559***	0.0579***	0.0529***	0.0655***	0.0895***	0.1166***	0.1268***	0.1180***
Log education and health consumption	0.0992***	0.1055***	0.1016***	0.1029***	0.0859***	0.1005***	0.0613***	0.0553***	0.0795***	0.0639***	0.0896***	0.0751***	0.0480***
Head post-secondary				-0.0700***					-0.0416**				
Head upper-secondary	0.0585***							-0.0271**			0.0155		
Spouse post-secondary		-0.1106***	-0.0631***	-0.0495*									
Spouse upper-secondary			-0.0255***	-0.0322**	-0.0337***			-0.0310**					
Urban dummy		0.0814***	0.1083***	0.0703***	0.0768***		-0.0242**	-0.0230**	-0.0440***		-0.0015	0.0903***	0.0956***
Red River Delta	-0.1707***		-0.0376***				-0.0783***	-0.0712***	-0.1093***	-0.0755***	-0.1090***	-0.0631***	
Northern and Coastal Central	-0.0721**	0.0319*	-0.0731***	-0.0490***	-0.0536***		0.0480***	0.0468***	0.0876***	0.0972***	0.1260***		0.0427***
Central Highlands		0.0667**	-0.0946***	-0.0468***			0.0353**	0.0354*		0.0242			0.0853***
Southeast	0.0707*	0.1972***	0.0570***	0.1071***				0.0213	0.0810***	0.1219***	0.1319***	0.1304***	0.1517***
Mekong River Delta	0.1422***	0.1091***	0.1359***	0.1072***	0.1289***	0.1127***	0.1303***	0.0862***	0.1640***	0.1767***	0.1898***		
Telephone		0.1082***	0.1115***	0.0778***	0.0799***	0.0755***	0.0943***	0.0877***	0.0774***	0.0743***		0.0363**	0.0779***
Electric water pump	0.1091***	0.1114***	0.0618***	0.0467***	0.0534***	0.0523***	-0.0152			0.0446***			0.0378***

Predictor variables	VLSS 1993	VLSS 1998	VHLSS 2002	VHLSS 2004	VHLSS 2006	VHLSS 2008	VHLSS 2010	VHLSS 2012	VHLSS 2014	VHLSS 2016	VHLSS 2018	VHLSS 2020	VHLSS 2022
Electric water pump	0.0980***	0.0700***	0.0469***	0.0444***	0.0525***	0.0560***						-0.0090	
Village with car-accessible road	-0.0962***		-0.0333***	-0.0268*		-0.0205**		-0.0634***	-0.0595***	-0.0726***			
Village with an all-weather passable road	0.0736**	-0.0804***			-0.0304***								
Distance to nearest town		0.0014*	0.0010**				0.0012***			0.0015***			
Hanoi capital dummy	0.1342***		0.0353**		-0.0353*		0.2464***	0.1538***	0.1740***	0.1409***	0.2545***	0.1645***	0.1469***
HCM city	-0.1009*	-0.0784**	0.2084***	0.1514***	0.1424***	0.1482***	0.1701***		0.2934***	0.0903***	0.1510***	0.1870***	0.1146***
Log of housing value	0.0842***	0.0649***	0.0293***	0.0246***	0.0351***	0.0247***	0.1091***	0.1336***	0.1464***	0.1186***	0.0981***	0.0987***	0.0755***
Color television	0.1482***	0.0979***	0.1136***	0.1156***	0.0911***	0.0856***	-0.0053		-0.0431***	-0.0109	-0.0195		-0.0029
Village with periodic market	-0.0921***	0.0637***	0.0240***										
Radio	0.1414***	0.0643***	0.0439***	0.0285***	0.0498***	0.0428***							0.0503
Head is married			0.0477***	0.0708***					0.0634***		0.0669***		
Gas stove		0.0665***	0.0870***	0.1152***	0.1036***	0.1131***	0.0911***	0.0933***	0.0862***	0.0683***			0.0514***
Spouse is leader							0.1154**	0.1320***		0.1371***	0.1541***	0.1566***	0.1959***
Spouse is professional			0.0555***	0.0696***									
Village with post office	-0.0295				-0.0219**	-0.0309***				-0.0121			-0.0199*
Constant	7.4482***	7.6510***	7.9975***	7.9580***	7.9669***	7.9684***	7.7807***	7.7156***	7.2295***	7.5552***	7.3681***	7.3240***	7.7028***
Observations	4,799	5,999	29,530	9,176	9,178	9,183	9,399	9,399	9,399	9,399	9,396	9,389	9,398
R-squared	0.662	0.792	0.767	0.773	0.758	0.728	0.777	0.761	0.766	0.762	0.755	0.759	0.725
Number of clusters	300	370	2,901	3,056	3,058	3,058	3,132	3,133	3,132	3,133	3,131	3,062	3,086
Sigma u	0.128	0.108	0.155	0.146	0.151	0.146	0.157	0.159	0.159	0.156	0.167	0.163	0.175
Sigma e	0.306	0.263	0.256	0.265	0.269	0.285	0.271	0.265	0.262	0.271	0.278	0.279	0.294
rho	0.148	0.144	0.268	0.233	0.239	0.207	0.253	0.264	0.269	0.250	0.265	0.256	0.261

*** p<0.01, ** p<0.05, * p<0.1. The standard errors are clustered at the village level.

Table A.15. Regression of log of real per capita consumption: backward stepwise regression

Predictor variables	VLSS 1993	VLSS 1998	VHLSS 2002	VHLSS 2004	VHLSS 2006	VHLSS 2008	VHLSS 2010	VHLSS 2012	VHLSS 2014	VHLSS 2016	VHLSS 2018	VHLSS 2020	VHLSS 2022
Ethnic minorities	-0.0728***	-0.0531***	-0.0499***	-0.0559***	-0.0568***		-0.0718***		-0.0521***	-0.0394***	-0.0452***	-0.0566***	-0.0904***
Household size	-0.0582***	-0.0720***	-0.0606***	-0.0598***	-0.0606***	-0.0691***	-0.0947***	-0.0897***	-0.0903***	-0.0921***	-0.0772***	-0.0748***	-0.0851***
Proportion of children	-0.2877***	-0.2734***	-0.3771***	-0.3546***	-0.3526***	-0.3364***	-0.3198***	-0.3251***	-0.2859***	-0.2889***	-0.3096***	-0.2597***	-0.2622***
Proportion of females	-0.0391	-0.0636***	-0.0535***	-0.0721***		-0.0575***	-0.0531***	-0.0910***		-0.0560***	-0.0683***	-0.0405**	
Proportion of elderly	-0.1478***	-0.0602***	-0.0884***	-0.0881***	-0.0838***	-0.0644***	-0.0561***		-0.0614***		-0.0962***		
Ratio of upper secondary	0.1070***		0.1647***	0.1839***	0.2069***	0.1486***	0.1461***	0.1942***	0.1517***	0.1307***	0.1273***	0.1564***	0.1065***
Ratio of post-secondary		0.3291***	0.3830***	0.3119***	0.3820***	0.4043***	0.3123***	0.2957***	0.3478***	0.2776***	0.3075***	0.2823***	0.2817***
Male household head		0.0268**			0.0442***				0.0287***	0.0344***		0.0313***	
Household head age		-0.0015***	-0.0010***		-0.0010***	-0.0009**	-0.0016***	-0.0030***	-0.0020***	-0.0024***	-0.0019***	-0.0029***	-0.0028***
Living with spouse		-0.0411***	-0.0621***	-0.0866***	-0.0600***	-0.0432***	-0.0247***	-0.0658***	-0.1164***	-0.0896***	-0.1107***	-0.0741***	-0.0579***
Head is leader				0.0816***	0.0701***	0.0630***	0.0756***	0.1318***	0.1417***	0.0997***	0.1931***	0.1637***	0.1979***
Head is professional	0.0658**	0.0487**	0.0412***		0.0514***		0.0609***	0.0381**	0.0780***	0.0676***		0.0418***	
Stereos	0.2076***	0.1343***	0.0856***	0.0764***	0.0730***	0.0673***	0.0667***	0.0589***	0.0539***	0.0780***	0.1061***	0.0708***	0.1175***
PC computer			0.0703***	0.0636***		0.0742***	0.0476***	0.0797***	0.0684***	0.0828***	0.0592***	0.0921***	0.1167***
Motorbike	0.2854***	0.2293***	0.1977***	0.1695***	0.1684***	0.1725***	0.1513***	0.1348***	0.1170***	0.1431***	0.1053***	0.1117***	0.1015***
Washing machine	0.2959***		0.0686***	0.0923***	0.0856***	0.0969***	0.0599***	0.0660***	0.0465***	0.0731***	0.0770***	0.0739***	0.0846***
Water heater		0.0840***	0.0719***	0.0833***	0.0507***	0.0771***	0.0833***	0.0614***	0.0549***	0.0502***	0.0548***	0.0415***	0.0599***
Fridge	0.0974***	0.0956***	0.0869***	0.0904***	0.0915***	0.0817***	0.0835***	0.0765***	0.0563***	0.0543***	0.0489***	0.0515***	0.0636***
Air conditioner		0.1904***	0.1667***	0.2078***	0.2199***	0.2364***	0.1906***	0.1305***	0.1325***	0.1350***	0.0893***	0.0896***	0.0929***
Log living area	0.1025***	0.1011***	0.0998***	0.1248***	0.1197***	0.1040***	0.1269***	0.1194***	0.1175***	0.1199***	0.1638***	0.1789***	0.1857***
Tap water		0.0680***	0.0305***	0.0595***					0.0329***		0.0053		
Clean water		0.0300***			-0.0187**					-0.0154*			-0.0274***
Flush latrine	0.0420*		0.0528***	0.0450***	0.0651***	0.0393***	0.0586***	0.0559***	0.0476***	0.0698***	0.0840***	0.0622***	0.0406***
Log utility consumption	0.0287***	0.0319***	0.0310***	0.0314***	0.0431***	0.0542***	0.0572***	0.0529***	0.0629***	0.0878***	0.1150***	0.1260***	0.1162***
Log education and health consumption	0.0991***	0.1062***	0.1016***	0.1027***	0.0856***	0.1004***	0.0612***	0.0556***	0.0792***	0.0639***	0.0892***	0.0750***	0.0479***
Head post-secondary			-0.0307**						-0.0418**				
Head upper-secondary	0.0602***	0.0467***	0.0013					-0.0263**			0.0148		
Spouse post-secondary		-0.1284***	-0.0675***	-0.0375									
Spouse upper-secondary			-0.0236***	-0.0346***	-0.0368***			-0.0320***					
Urban dummy		0.0808***	0.0931***	0.0615***	0.0569***		-0.0337***	-0.0383***	-0.0644***		-0.0278**	0.0813***	0.0684***
Red River Delta	-0.1678***	-0.0359*	-0.0440***			-0.0254**	-0.0842***	-0.0720***	-0.1267***	-0.0848***	-0.1289***	-0.0647***	
Northern and Coastal Central	-0.0689**		-0.0723***	-0.0421***	-0.0468***		0.0525***	0.0553***	0.0764***	0.0911***	0.1120***		0.0413***
Central Highlands		0.0469	-0.0904***	-0.0446***			0.0444**	0.0440**		0.0236			0.0898***
Southeast	0.0733*	0.1607***	0.0477***	0.1076***					0.0579***	0.1059***	0.0988***	0.1279***	0.1573***
Mekong River Delta	0.1453***	0.0741***	0.1319***	0.1133***	0.1339***	0.1147***	0.1315***	0.0964***	0.1507***	0.1700***	0.1738***		
Telephone		0.1096***	0.1119***	0.0790***	0.0785***	0.0766***	0.0919***	0.0891***	0.0768***	0.0736***		0.0357**	0.0780***
Electric water pump	0.1098***	0.1120***	0.0614***	0.0466***	0.0532***	0.0538***	-0.0149			0.0443***			0.0379***

Predictor variables	VLSS 1993	VLSS 1998	VHLSS 2002	VHLSS 2004	VHLSS 2006	VHLSS 2008	VHLSS 2010	VHLSS 2012	VHLSS 2014	VHLSS 2016	VHLSS 2018	VHLSS 2020	VHLSS 2022
Electric water pump	0.0967***	0.0705***	0.0475***	0.0433***	0.0530***	0.0566***						-0.0060	
Village with car-accessible road	-0.0962***		-0.0339***	-0.0279*				-0.0799***	-0.0606***	-0.0722***			
Village with an all-weather passable road	0.0743**	-0.0830***			-0.0335***			0.0199					
Distance to nearest town		0.0016**	0.0011**				0.0013***			0.0016***			
Hanoi capital dummy	0.1367***				-0.0675***		0.2147***	0.1244***	0.1495***	0.1218***	0.2153***	0.1458***	0.1142***
HCM city	-0.0983*	-0.0767**	0.1548***	0.1227***	0.0849***	0.0862***	0.0970***		0.2517***	0.0597**	0.0961***	0.1406***	
Log of housing value	0.0828***	0.0649***	0.0288***	0.0230***	0.0331***	0.0224***	0.1067***	0.1304***	0.1440***	0.1165***	0.0958***	0.0977***	0.0752***
Color television	0.1473***	0.0995***	0.1134***	0.1159***	0.0918***	0.0869***	-0.0046		-0.0421***		-0.0195		-0.0030
Village with periodic market	-0.0922***	0.0625***	0.0232***		0.0161								
Radio	0.1413***	0.0648***	0.0438***	0.0286***	0.0499***	0.0433***							0.0531
Head is married	0.0322**		0.0469***	0.0703***					0.0658***		0.0690***		
Gas stove		0.0683***	0.0865***	0.1157***	0.1035***	0.1108***	0.0912***	0.0960***	0.0861***	0.0688***			0.0519***
Spouse is leader		0.1252**					0.1185***	0.1419***		0.1371***	0.1582***	0.1565***	0.1968***
Spouse is professional		0.0455**	0.0505***	0.0692***	0.0387**			0.0325*					
Nighttime light density of district			0.0016***	0.0012***	0.0019***	0.0019***	0.0023***	0.0021***	0.0016***	0.0012***	0.0023***	0.0005***	0.0009***
Village with post office	-0.0293				-0.0281***	-0.0297***				-0.0172*			
Constant	7.4617***	7.7061***	7.9927***	7.9590***	7.9612***	7.9684***	7.7559***	7.7067***	7.2367***	7.5636***	7.3801***	7.3330***	7.7000***
Observations	4,799	5,999	29,530	9,176	9,178	9,183	9,399	9,399	9,399	9,399	9,396	9,389	9,398
R-squared	0.662	0.794	0.767	0.773	0.759	0.729	0.778	0.762	0.766	0.762	0.756	0.759	0.726
Number of clusters	300	370	2,901	3,056	3,058	3,058	3,132	3,133	3,132	3,133	3,131	3,062	3,086
Sigma u	0.128	0.108	0.155	0.146	0.150	0.145	0.157	0.158	0.159	0.157	0.165	0.163	0.174
Sigma e	0.306	0.263	0.256	0.265	0.269	0.285	0.270	0.265	0.263	0.271	0.278	0.279	0.294
rho	0.149	0.145	0.268	0.232	0.237	0.205	0.253	0.263	0.267	0.250	0.260	0.254	0.259

*** p<0.01, ** p<0.05, * p<0.1. The standard errors are clustered at the village level.

Table A.16. Imputation of welfare indicators in VHLSS 2012 using VHLSS 2010 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	31772.4	32224.7	32166.6	32293.9	31346.4	31064.5	1.4	1.2	1.6	1.3	2.2
	(340.0)	(389.2)	(387.9)	(400.8)	(346.9)	(335.2)	(14.5)	(14.1)	(17.9)	(2.0)	(1.4)
Poverty headcount rate (%)	17.2	18.0	18.5	19.3	19.1	19.5	4.7	7.7	11.9	11.2	13.1
	(0.5)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(29.7)	(29.8)	(28.8)	(27.9)	(25.4)
Poverty gap (%)	4.5	5.0	5.2	5.2	5.2	5.3	12.9	16.0	15.9	15.4	17.8
	(0.2)	(0.3)	(0.3)	(0.2)	(0.2)	(0.2)	(61.3)	(60.3)	(40.9)	(39.8)	(34.6)
USAID poverty gap (%)	26.0	28.0	28.0	26.9	26.9	27.0	7.9	7.7	3.6	3.7	4.2
	(0.5)	(0.8)	(0.8)	(0.6)	(0.6)	(0.6)	(55.9)	(50.3)	(17.4)	(18.8)	(13.2)
Food poverty headcount rate (%)	6.4	7.5	7.7	7.7	7.7	7.8	16.1	19.5	20.0	19.4	21.5
	(0.3)	(0.5)	(0.5)	(0.4)	(0.4)	(0.4)	(43.7)	(43.8)	(34.2)	(33.1)	(28.1)
Vulnerability rate (%)	13.4	12.6	12.7	12.9	13.0	13.3	6.1	5.6	3.8	3.1	1.2
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(4.4)	(3.9)	(3.8)	(4.9)	(5.1)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	31772.4	32361.7	32295.2	32427.3	31522.3	31312.3	1.9	1.6	2.1	0.8	1.4
	(340.0)	(421.5)	(418.7)	(433.2)	(381.0)	(380.1)	(24.0)	(23.1)	(27.4)	(12.1)	(11.8)
Poverty headcount rate (%)	17.2	17.8	18.3	19.0	18.9	19.3	3.5	6.7	10.7	10.1	12.4
	(0.5)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(31.5)	(31.9)	(30.8)	(31.2)	(30.2)
Poverty gap (%)	4.5	4.9	5.1	5.0	5.0	5.1	9.9	13.2	13.0	12.6	14.9
	(0.2)	(0.3)	(0.3)	(0.2)	(0.2)	(0.2)	(50.5)	(55.1)	(44.3)	(43.9)	(43.1)
USAID poverty gap (%)	26.0	27.6	27.5	26.5	26.6	26.5	6.2	6.1	2.1	2.3	2.2
	(0.5)	(0.7)	(0.7)	(0.6)	(0.6)	(0.6)	(37.2)	(38.3)	(19.3)	(20.4)	(18.9)
Food poverty headcount rate (%)	6.4	7.2	7.5	7.5	7.4	7.5	12.4	15.9	15.9	15.6	17.3
	(0.3)	(0.5)	(0.5)	(0.4)	(0.4)	(0.4)	(38.8)	(42.9)	(36.5)	(36.0)	(34.3)
Vulnerability rate (%)	13.4	12.8	12.9	13.2	13.3	13.6	4.4	4.0	1.9	0.6	1.1
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(8.0)	(7.5)	(6.6)	(8.4)	(7.3)
Adj R-squared	N/A	0.76	0.76	0.72	0.71	0.66	0.00	0.00	0.00	0.00	0.00
Obs. (the base survey)	N/A	9393	9393	9393	9393	9393					
Obs. (the target survey)	N/A	9399	9399	9399	9399	9399					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.17. Imputation of welfare indicators in VHLSS 2014 using VHLSS 2010 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	33623.8	35256.9	35205.9	34915.3	33851.4	33040.9	4.9	4.7	3.8	0.7	1.7
	(351.8)	(478.5)	(478.8)	(487.8)	(419.8)	(398.9)	(36.0)	(36.1)	(38.6)	(19.3)	(13.4)
Poverty headcount rate (%)	13.5	13.2	13.8	15.3	15.8	17.3	2.2	2.3	12.9	16.9	27.9
	(0.4)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(26.4)	(28.8)	(30.2)	(33.5)	(36.7)
Poverty gap (%)	3.7	3.5	3.7	4.0	4.2	4.6	7.4	1.6	6.7	11.6	23.2
	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(25.9)	(30.5)	(23.0)	(25.9)	(28.6)
USAID poverty gap (%)	27.6	26.1	26.5	26.1	26.3	26.6	5.3	3.8	5.4	4.5	3.7
	(0.6)	(0.8)	(0.8)	(0.6)	(0.6)	(0.6)	(27.6)	(25.0)	(3.6)	(4.2)	(0.3)
Food poverty headcount rate (%)	5.5	5.0	5.3	5.8	6.1	6.8	9.8	3.6	5.6	11.3	22.6
	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(21.0)	(25.5)	(21.2)	(23.9)	(27.0)
Vulnerability rate (%)	11.0	11.0	11.0	11.4	11.7	12.3	0.1	0.1	3.8	6.3	11.8
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(8.8)	(7.0)	(8.2)	(11.1)	(13.7)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	33623.8	35399.0	35344.7	35046.7	34035.6	33293.6	5.3	5.1	4.2	1.2	1.0
	(351.8)	(545.2)	(542.3)	(553.9)	(468.3)	(453.5)	(55.0)	(54.1)	(57.4)	(33.1)	(28.9)
Poverty headcount rate (%)	13.5	12.9	13.6	14.9	15.5	17.1	4.6	0.2	10.4	14.8	26.1
	(0.4)	(0.5)	(0.5)	(0.6)	(0.6)	(0.6)	(19.6)	(20.7)	(23.6)	(32.3)	(39.9)
Poverty gap (%)	3.7	3.3	3.6	3.9	4.0	4.5	10.7	4.8	3.5	8.5	19.4
	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(19.0)	(23.5)	(16.4)	(24.0)	(31.0)
USAID poverty gap (%)	27.6	25.8	26.2	25.8	26.1	26.1	6.4	5.0	6.3	5.5	5.3
	(0.6)	(0.8)	(0.8)	(0.7)	(0.7)	(0.6)	(34.6)	(33.5)	(6.9)	(7.5)	(3.2)
Food poverty headcount rate (%)	5.5	4.8	5.1	5.6	5.9	6.5	13.3	6.9	2.0	7.7	18.5
	(0.3)	(0.3)	(0.4)	(0.3)	(0.4)	(0.4)	(15.3)	(18.5)	(14.7)	(22.7)	(29.5)
Vulnerability rate (%)	11.0	11.1	11.1	11.5	11.8	12.5	0.8	1.0	5.1	7.7	13.8
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(11.5)	(8.2)	(10.8)	(14.2)	(13.8)
Adj R-squared	N/A	0.76	0.76	0.72	0.71	0.66					
Obs. (the base survey)	N/A	9393	9393	9393	9393	9393					
Obs. (the target survey)	N/A	9399	9399	9399	9399	9399					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.18. Imputation of welfare indicators in VHLSS 2016 using VHLSS 2010 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	38827.2	39070.0	38718.2	38055.5	36967.7	36191.1	0.6	0.3	2.0	4.8	6.8
	(418.4)	(494.5)	(498.7)	(484.5)	(428.4)	(413.4)	(18.2)	(19.2)	(15.8)	(2.4)	(1.2)
Poverty headcount rate (%)	9.8	11.3	12.1	13.9	14.0	14.7	15.1	23.6	42.3	43.2	50.4
	(0.4)	(0.7)	(0.7)	(0.7)	(0.7)	(0.7)	(53.1)	(55.6)	(53.0)	(53.1)	(54.3)
Poverty gap (%)	2.6	3.1	3.3	3.8	3.8	4.0	18.3	28.8	45.5	47.5	55.5
	(0.2)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(90.4)	(95.4)	(65.4)	(66.4)	(74.2)
USAID poverty gap (%)	26.5	27.2	27.6	27.1	27.3	27.4	2.8	4.2	2.3	3.0	3.4
	(0.8)	(1.4)	(1.3)	(0.9)	(0.9)	(0.9)	(65.9)	(58.3)	(8.3)	(9.7)	(13.9)
Food poverty headcount rate (%)	3.8	4.5	4.9	5.6	5.7	6.0	17.6	29.4	47.3	49.9	56.8
	(0.3)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(71.3)	(75.7)	(55.6)	(56.2)	(61.2)
Vulnerability rate (%)	8.5	9.0	9.3	9.8	9.9	10.5	5.9	8.6	15.4	16.3	22.6
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(5.6)	(5.3)	(6.2)	(7.5)	(9.4)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	38827.2	39237.8	38879.3	38220.0	37182.4	36472.2	1.1	0.1	1.6	4.2	6.1
	(418.4)	(499.4)	(491.7)	(500.7)	(442.5)	(442.1)	(19.4)	(17.5)	(19.7)	(5.8)	(5.7)
Poverty headcount rate (%)	9.8	11.0	11.9	13.7	13.8	14.5	12.9	21.7	40.3	41.5	48.8
	(0.4)	(0.5)	(0.5)	(0.6)	(0.6)	(0.6)	(22.1)	(25.2)	(31.1)	(32.3)	(31.8)
Poverty gap (%)	2.6	3.0	3.2	3.7	3.7	3.9	14.5	25.1	41.7	44.1	51.6
	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(26.0)	(31.9)	(29.8)	(31.4)	(28.5)
USAID poverty gap (%)	26.5	26.9	27.2	26.8	27.0	27.0	1.4	2.7	1.0	1.9	1.9
	(0.8)	(1.0)	(0.9)	(0.8)	(0.8)	(0.7)	(15.4)	(13.4)	(9.1)	(9.0)	(13.8)
Food poverty headcount rate (%)	3.8	4.3	4.8	5.5	5.6	5.8	13.4	24.6	42.9	46.0	52.6
	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(20.5)	(24.2)	(26.9)	(28.1)	(24.7)
Vulnerability rate (%)	8.5	9.2	9.4	10.0	10.0	10.6	7.3	10.1	16.8	17.5	24.0
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(4.2)	(4.7)	(6.1)	(8.3)	(9.0)
Adj R-squared	N/A	0.76	0.76	0.72	0.71	0.66					
Obs. (the base survey)	N/A	9393	9393	9393	9393	9393					
Obs. (the target survey)	N/A	9399	9399	9399	9399	9399					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.19. Imputation of welfare indicators in VHLSS 2018 using VHLSS 2010 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	43200.0	42833.5	42440.7	41332.8	39927.9	38733.5	0.8	1.8	4.3	7.6	10.3
	(474.4)	(541.1)	(532.6)	(542.7)	(465.4)	(464.9)	(14.1)	(12.3)	(14.4)	(1.9)	(2.0)
Poverty headcount rate (%)	7.0	8.7	9.3	10.6	11.0	13.1	24.1	31.9	50.8	56.8	85.7
	(0.4)	(0.5)	(0.5)	(0.5)	(0.5)	(0.6)	(29.4)	(32.0)	(37.1)	(40.0)	(47.7)
Poverty gap (%)	2.0	2.3	2.5	2.7	2.9	3.5	18.1	25.9	37.7	44.6	77.5
	(0.1)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(30.3)	(31.5)	(22.1)	(25.1)	(36.2)
USAID poverty gap (%)	28.1	26.8	26.9	25.7	26.0	26.9	4.8	4.5	8.6	7.7	4.4
	(1.0)	(1.2)	(1.1)	(0.8)	(0.8)	(0.8)	(19.1)	(10.6)	(15.7)	(16.0)	(21.5)
Food poverty headcount rate (%)	3.2	3.4	3.6	4.0	4.2	5.2	5.7	12.9	23.4	30.0	61.9
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.4)	(10.6)	(13.1)	(8.6)	(11.4)	(20.5)
Vulnerability rate (%)	6.6	7.4	7.7	8.5	8.7	9.5	13.4	17.0	29.4	33.1	44.8
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(2.9)	(2.7)	(5.9)	(9.1)	(12.7)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	43200.0	43016.1	42613.3	41491.4	40155.2	39035.0	0.4	1.4	4.0	7.0	9.6
	(474.4)	(584.7)	(569.4)	(564.5)	(494.2)	(510.8)	(23.2)	(20.0)	(19.0)	(4.2)	(7.7)
Poverty headcount rate (%)	7.0	8.5	9.1	10.4	10.9	12.9	21.3	28.9	48.0	54.4	83.6
	(0.4)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(45.9)	(47.6)	(51.0)	(56.2)	(62.3)
Poverty gap (%)	2.0	2.3	2.4	2.6	2.8	3.4	14.1	22.1	33.9	41.1	73.3
	(0.1)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(65.7)	(64.9)	(39.8)	(43.7)	(54.8)
USAID poverty gap (%)	28.1	26.5	26.7	25.5	25.7	26.6	5.9	5.2	9.5	8.6	5.6
	(1.0)	(1.6)	(1.5)	(0.9)	(0.9)	(0.9)	(68.8)	(52.8)	(2.8)	(3.6)	(7.5)
Food poverty headcount rate (%)	3.2	3.3	3.5	3.8	4.1	5.1	2.1	9.7	19.5	26.6	57.3
	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(34.6)	(37.1)	(23.7)	(27.4)	(35.2)
Vulnerability rate (%)	6.6	7.4	7.7	8.5	8.7	9.5	12.6	17.5	29.0	33.1	45.4
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(4.5)	(5.1)	(8.9)	(13.7)	(15.5)
Adj R-squared	N/A	0.76	0.76	0.72	0.71	0.66					
Obs. (the base survey)	N/A	9393	9393	9393	9393	9393					
Obs. (the target survey)	N/A	9396	9396	9396	9396	9396					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.20. Imputation of welfare indicators in VHLSS 2020 using VHLSS 2010 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	48333.3	56470.6	51797.3	53235.4	44300.0	42841.7	16.8	7.2	10.1	8.3	11.4
	(573.3)	(3663.0)	(1510.0)	(3236.6)	(462.1)	(445.8)	(539.0)	(163.4)	(464.6)	(19.4)	(22.2)
Poverty headcount rate (%)	5.0	6.5	7.0	8.1	7.8	9.4	29.9	40.6	61.5	54.7	87.4
	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.5)	(39.7)	(43.9)	(50.3)	(48.5)	(58.5)
Poverty gap (%)	1.2	1.6	1.8	2.0	1.9	2.5	28.3	41.8	61.5	55.3	98.9
	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.2)	(46.0)	(52.7)	(57.6)	(54.8)	(73.7)
USAID poverty gap (%)	24.7	24.4	24.9	24.6	24.8	26.2	1.2	0.9	0.0	0.4	6.1
	(0.9)	(1.0)	(1.0)	(0.9)	(0.9)	(0.8)	(7.0)	(3.7)	(6.9)	(3.6)	(9.8)
Food poverty headcount rate (%)	1.7	2.2	2.5	2.8	2.7	3.6	27.4	43.1	62.4	56.7	105.2
	(0.2)	(0.2)	(0.2)	(0.3)	(0.3)	(0.3)	(34.7)	(40.9)	(46.9)	(44.3)	(60.9)
Vulnerability rate (%)	5.3	6.3	6.4	7.2	7.0	7.6	17.2	20.8	34.0	30.5	41.7
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(7.4)	(7.5)	(11.1)	(12.3)	(14.7)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	48333.3	56655.3	51968.3	53453.1	44531.6	43173.3	17.2	7.5	10.6	7.9	10.7
	(573.3)	(1990.1)	(1064.0)	(1929.6)	(501.8)	(490.9)	(247.2)	(85.6)	(236.6)	(12.5)	(14.4)
Poverty headcount rate (%)	5.0	6.3	6.9	7.9	7.6	9.2	25.5	36.7	58.2	52.0	83.4
	(0.3)	(0.4)	(0.5)	(0.5)	(0.5)	(0.5)	(49.5)	(55.0)	(65.8)	(65.3)	(73.4)
Poverty gap (%)	1.2	1.5	1.7	1.9	1.9	2.4	22.7	36.4	55.9	50.1	93.5
	(0.1)	(0.1)	(0.2)	(0.2)	(0.2)	(0.2)	(56.2)	(67.8)	(83.8)	(83.6)	(97.8)
USAID poverty gap (%)	24.7	24.1	24.6	24.3	24.4	26.0	2.2	0.2	1.4	1.2	5.5
	(0.9)	(1.0)	(1.0)	(0.9)	(0.9)	(0.9)	(7.6)	(6.4)	(0.4)	(2.2)	(7.3)
Food poverty headcount rate (%)	1.7	2.1	2.4	2.7	2.6	3.5	21.8	37.2	56.8	51.9	99.5
	(0.2)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(44.6)	(56.2)	(71.2)	(70.0)	(83.3)
Vulnerability rate (%)	5.3	6.2	6.4	7.1	6.9	7.5	16.7	19.8	33.4	29.1	40.9
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(9.5)	(9.7)	(12.3)	(13.3)	(14.8)
Adj R-squared	N/A	0.76	0.76	0.72	0.71	0.66	0.00	0.00	0.00	0.00	0.00
Obs. (the base survey)	N/A	9393	9393	9393	9393	9393	0				
Obs. (the target survey)	N/A	9389	9389	9389	9389	9389	0				

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.21. Imputation of welfare indicators in VHLSS 2022 using VHLSS 2010 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	45657.9	56154.3	52818.3	54517.8	46588.6	44438.2	23.0	15.7	19.4	2.0	2.7
	(693.8)	(1939.4)	(1088.7)	(1743.0)	(489.4)	(468.6)	(179.5)	(56.9)	(151.2)	(29.5)	(32.5)
Poverty headcount rate (%)	6.2	5.6	6.3	6.5	6.4	8.3	9.0	1.1	4.2	2.7	33.7
	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.5)	(23.5)	(28.1)	(23.5)	(23.8)	(36.5)
Poverty gap (%)	1.6	1.4	1.6	1.6	1.5	2.2	14.3	2.0	3.3	4.4	34.5
	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.2)	(14.0)	(21.7)	(12.7)	(11.7)	(31.6)
USAID poverty gap (%)	26.0	24.5	25.2	24.1	24.2	26.2	5.7	3.0	7.2	6.8	0.6
	(1.1)	(1.2)	(1.1)	(1.0)	(1.1)	(1.0)	(7.3)	(4.4)	(3.2)	(2.2)	(10.5)
Food poverty headcount rate (%)	2.4	2.0	2.3	2.2	2.2	3.2	16.7	3.2	7.3	8.3	34.7
	(0.2)	(0.2)	(0.3)	(0.2)	(0.2)	(0.3)	(15.3)	(22.9)	(14.8)	(14.0)	(33.5)
Vulnerability rate (%)	5.3	5.4	5.7	6.0	6.0	6.8	1.1	6.6	12.5	12.4	27.8
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(17.8)	(19.0)	(21.0)	(26.2)	(30.6)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	45657.9	56368.4	53025.8	54741.6	46872.6	44803.7	23.5	16.1	19.9	2.7	1.9
	(693.8)	(2801.7)	(1228.0)	(2241.0)	(501.8)	(481.5)	(303.8)	(77.0)	(223.0)	(27.7)	(30.6)
Poverty headcount rate (%)	6.2	5.5	6.1	6.3	6.2	8.2	11.4	1.4	1.6	0.5	31.5
	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.5)	(30.5)	(35.4)	(28.9)	(29.1)	(44.2)
Poverty gap (%)	1.6	1.3	1.5	1.5	1.5	2.1	17.0	4.7	5.9	6.5	31.3
	(0.1)	(0.1)	(0.2)	(0.1)	(0.1)	(0.2)	(23.9)	(32.1)	(14.6)	(14.2)	(38.1)
USAID poverty gap (%)	26.0	24.4	25.1	24.1	24.2	26.0	6.3	3.4	7.4	7.0	0.2
	(1.1)	(1.3)	(1.2)	(1.0)	(1.0)	(1.0)	(17.9)	(12.4)	(5.3)	(3.8)	(8.9)
Food poverty headcount rate (%)	2.4	1.9	2.2	2.1	2.1	3.1	19.6	6.1	9.7	10.2	31.0
	(0.2)	(0.3)	(0.3)	(0.2)	(0.2)	(0.3)	(24.1)	(32.8)	(16.6)	(15.9)	(40.0)
Vulnerability rate (%)	5.3	5.4	5.7	6.0	6.0	6.8	0.9	7.0	13.0	12.8	27.6
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(17.7)	(17.9)	(21.2)	(26.3)	(30.1)
Adj R-squared	N/A	0.76	0.76	0.72	0.71	0.66					
Obs. (the base survey)	N/A	9393	9393	9393	9393	9393					
Obs. (the target survey)	N/A	9398	9398	9398	9398	9398					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.22. Imputation of welfare indicators in VHLSS 2010 using VHLSS 2012 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	30886.1	29733.1	29931.3	29927.6	29357.2	29700.1	3.7	3.1	3.1	5.0	3.8
	(404.5)	(361.1)	(363.0)	(367.8)	(331.7)	(322.8)	(10.7)	(10.3)	(9.1)	(18.0)	(20.2)
Poverty headcount rate (%)	20.7	21.2	21.0	21.3	21.2	20.5	2.3	1.3	2.8	2.4	1.3
	(0.5)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(22.4)	(20.6)	(17.9)	(18.4)	(14.1)
Poverty gap (%)	5.9	5.9	5.7	5.6	5.6	5.4	0.6	3.0	5.2	5.6	9.0
	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(19.3)	(16.6)	(5.7)	(5.3)	(2.6)
USAID poverty gap (%)	28.4	27.6	27.2	26.2	26.2	26.2	2.9	4.2	7.8	7.8	7.8
	(0.5)	(0.6)	(0.6)	(0.5)	(0.5)	(0.6)	(13.1)	(11.4)	(2.5)	(1.1)	(2.9)
Food poverty headcount rate (%)	8.9	8.7	8.4	8.2	8.1	7.8	2.6	5.7	8.7	9.0	12.6
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(13.8)	(11.8)	(3.8)	(3.3)	(0.1)
Vulnerability rate (%)	14.9	14.2	14.3	14.6	14.7	14.4	4.1	3.6	1.9	1.0	3.1
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(4.2)	(4.0)	(3.1)	(4.5)	(2.9)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	30886.1	29868.9	30066.2	30026.4	29492.8	29869.9	3.3	2.7	2.8	4.5	3.3
	(404.5)	(416.8)	(419.6)	(412.5)	(367.8)	(351.1)	(3.0)	(3.7)	(2.0)	(9.1)	(13.2)
Poverty headcount rate (%)	20.7	21.3	21.1	21.4	21.3	20.5	2.7	1.7	3.0	2.8	1.4
	(0.5)	(0.7)	(0.7)	(0.6)	(0.6)	(0.6)	(26.8)	(24.4)	(18.9)	(19.1)	(13.5)
Poverty gap (%)	5.9	5.8	5.6	5.5	5.5	5.3	1.9	4.3	6.2	6.3	9.8
	(0.2)	(0.3)	(0.3)	(0.2)	(0.2)	(0.2)	(28.5)	(25.6)	(4.7)	(4.2)	(0.6)
USAID poverty gap (%)	28.4	27.1	26.7	25.8	25.9	26.0	4.4	5.8	8.9	8.8	8.5
	(0.5)	(0.7)	(0.7)	(0.5)	(0.5)	(0.6)	(23.4)	(22.5)	(2.1)	(0.7)	(3.8)
Food poverty headcount rate (%)	8.9	8.5	8.2	8.1	8.1	7.7	5.1	8.0	9.9	9.9	13.5
	(0.4)	(0.5)	(0.5)	(0.4)	(0.4)	(0.4)	(22.3)	(19.5)	(3.0)	(2.3)	(1.7)
Vulnerability rate (%)	14.9	14.5	14.5	14.7	14.8	14.7	2.2	2.2	1.0	0.2	1.1
	(0.4)	(0.4)	(0.4)	(0.4)	(0.5)	(0.4)	(6.2)	(5.9)	(5.3)	(6.8)	(4.9)
Adj R-squared	N/A	0.74	0.74	0.70	0.69	0.65					
Obs. (the base survey)	N/A	9399	9399	9399	9399	9399					
Obs. (the target survey)	N/A	9399	9399	9399	9399	9399					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.23. Imputation of welfare indicators in VHLSS 2014 using VHLSS 2012 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	33623.8	34312.6	34539.6	34174.8	33454.7	32950.4	2.0	2.7	1.6	0.5	2.0
	(351.8)	(410.1)	(408.1)	(419.4)	(373.5)	(367.3)	(16.6)	(16.0)	(19.2)	(6.2)	(4.4)
Poverty headcount rate (%)	13.5	13.0	13.2	14.5	14.9	16.0	3.6	2.3	7.2	10.4	18.5
	(0.4)	(0.5)	(0.5)	(0.5)	(0.5)	(0.6)	(16.7)	(17.9)	(19.1)	(22.7)	(26.0)
Poverty gap (%)	3.7	3.3	3.3	3.6	3.7	4.0	12.5	10.7	4.3	0.4	7.9
	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(13.5)	(17.0)	(7.9)	(10.3)	(10.4)
USAID poverty gap (%)	27.6	25.0	25.2	24.6	24.9	25.1	9.3	8.6	10.7	9.8	8.9
	(0.6)	(0.8)	(0.8)	(0.6)	(0.6)	(0.6)	(25.3)	(24.9)	(1.1)	(1.4)	(3.7)
Food poverty headcount rate (%)	5.5	4.6	4.7	5.1	5.3	5.8	16.5	14.6	8.0	3.5	5.1
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(10.0)	(12.9)	(7.3)	(9.8)	(10.4)
Vulnerability rate (%)	11.0	11.4	11.3	11.8	12.0	12.4	3.9	3.3	7.8	9.7	12.8
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(9.9)	(7.4)	(9.3)	(12.1)	(12.9)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	33623.8	34449.5	34674.5	34282.1	33605.3	33119.2	2.5	3.1	2.0	0.1	1.5
	(351.8)	(427.6)	(423.0)	(433.1)	(397.4)	(398.7)	(21.5)	(20.2)	(23.1)	(13.0)	(13.3)
Poverty headcount rate (%)	13.5	12.8	13.0	14.3	14.9	15.9	5.5	3.9	6.0	9.9	17.8
	(0.4)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(24.4)	(23.7)	(26.9)	(31.2)	(36.9)
Poverty gap (%)	3.7	3.2	3.2	3.5	3.7	4.0	15.3	13.3	6.4	1.9	6.0
	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(19.5)	(20.0)	(14.2)	(18.3)	(23.9)
USAID poverty gap (%)	27.6	24.7	24.9	24.4	24.6	24.8	10.3	9.7	11.7	10.7	10.0
	(0.6)	(0.8)	(0.8)	(0.7)	(0.7)	(0.7)	(34.1)	(32.8)	(6.9)	(7.6)	(6.0)
Food poverty headcount rate (%)	5.5	4.5	4.6	4.9	5.2	5.6	19.2	17.3	10.6	5.7	2.1
	(0.3)	(0.3)	(0.3)	(0.3)	(0.4)	(0.4)	(15.9)	(15.6)	(12.8)	(17.3)	(23.1)
Vulnerability rate (%)	11.0	11.7	11.6	11.9	12.1	12.6	6.9	5.2	8.2	10.2	14.6
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.5)	(14.7)	(12.4)	(13.2)	(15.6)	(18.6)
Adj R-squared	N/A	0.74	0.74	0.70	0.69	0.65					
Obs. (the base survey)	N/A	9399	9399	9399	9399	9399					
Obs. (the target survey)	N/A	9399	9399	9399	9399	9399					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.24. Imputation of welfare indicators in VHLSS 2016 using VHLSS 2012 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	38827.2	37731.9	37710.1	37002.2	36303.1	35814.6	2.8	2.9	4.7	6.5	7.8
	(418.4)	(441.0)	(442.7)	(422.7)	(374.8)	(362.3)	(5.4)	(5.8)	(1.0)	(10.4)	(13.4)
Poverty headcount rate (%)	9.8	11.0	11.4	13.1	13.2	13.6	12.0	16.9	34.5	35.0	39.1
	(0.4)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(33.3)	(33.5)	(33.9)	(34.2)	(34.2)
Poverty gap (%)	2.6	2.9	3.0	3.4	3.4	3.5	10.4	15.9	29.5	30.8	36.2
	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(46.2)	(43.1)	(27.5)	(28.0)	(37.0)
USAID poverty gap (%)	26.5	26.1	26.3	25.5	25.7	26.0	1.4	0.9	3.7	3.1	2.1
	(0.8)	(1.1)	(1.0)	(0.8)	(0.8)	(0.9)	(34.7)	(24.7)	(8.4)	(7.4)	(4.2)
Food poverty headcount rate (%)	3.8	4.1	4.3	4.9	4.9	5.1	8.5	13.7	28.3	29.6	34.9
	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(36.4)	(34.1)	(23.8)	(23.8)	(29.9)
Vulnerability rate (%)	8.5	9.4	9.6	10.2	10.3	10.6	10.5	12.5	19.7	20.4	24.2
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(6.0)	(6.0)	(8.6)	(9.2)	(10.1)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	38827.2	37907.4	37885.7	37155.2	36501.9	36047.8	2.4	2.4	4.3	6.0	7.2
	(418.4)	(508.9)	(509.8)	(504.0)	(457.6)	(438.8)	(21.6)	(21.8)	(20.4)	(9.4)	(4.9)
Poverty headcount rate (%)	9.8	10.8	11.3	13.0	13.1	13.6	10.3	15.5	33.3	34.2	38.7
	(0.4)	(0.7)	(0.7)	(0.7)	(0.7)	(0.7)	(61.3)	(61.8)	(63.4)	(64.0)	(60.7)
Poverty gap (%)	2.6	2.8	2.9	3.3	3.3	3.5	7.1	12.8	27.1	29.2	34.8
	(0.2)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(84.2)	(84.9)	(66.2)	(67.5)	(66.1)
USAID poverty gap (%)	26.5	25.7	25.9	25.3	25.5	25.8	2.9	2.4	4.7	3.7	2.8
	(0.8)	(1.3)	(1.3)	(0.9)	(0.9)	(1.0)	(57.7)	(54.5)	(11.7)	(13.6)	(14.9)
Food poverty headcount rate (%)	3.8	4.0	4.2	4.8	4.8	5.1	4.0	9.8	24.4	26.8	33.3
	(0.3)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(73.0)	(72.5)	(61.0)	(62.1)	(58.0)
Vulnerability rate (%)	8.5	9.6	9.8	10.4	10.4	10.8	12.9	14.8	21.6	22.1	26.1
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(12.5)	(12.4)	(12.3)	(13.6)	(14.0)
Adj R-squared	N/A	0.74	0.74	0.70	0.69	0.65					
Obs. (the base survey)	N/A	9399	9399	9399	9399	9399					
Obs. (the target survey)	N/A	9399	9399	9399	9399	9399					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.25. Imputation of welfare indicators in VHLSS 2018 using VHLSS 2012 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	43200.0	40971.3	40993.0	39905.5	38973.3	38043.6	5.2	5.1	7.6	9.8	11.9
	(474.4)	(551.4)	(540.0)	(536.8)	(468.1)	(474.1)	(16.2)	(13.8)	(13.2)	(1.3)	(0.1)
Poverty headcount rate (%)	7.0	8.5	8.7	9.9	10.3	12.0	21.1	24.1	41.4	46.3	71.1
	(0.4)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(52.9)	(54.0)	(51.2)	(53.5)	(57.7)
Poverty gap (%)	2.0	2.2	2.2	2.4	2.5	3.1	9.9	12.6	21.6	26.9	55.0
	(0.1)	(0.3)	(0.2)	(0.2)	(0.2)	(0.2)	(77.2)	(74.7)	(39.9)	(42.7)	(51.6)
USAID poverty gap (%)	28.1	25.5	25.5	24.2	24.4	25.5	9.2	9.2	14.0	13.2	9.4
	(1.0)	(1.5)	(1.5)	(1.0)	(0.9)	(0.9)	(57.8)	(49.0)	(2.6)	(2.6)	(7.4)
Food poverty headcount rate (%)	3.2	3.1	3.2	3.4	3.6	4.4	4.1	1.0	5.7	10.9	37.8
	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(47.1)	(47.4)	(24.6)	(27.1)	(31.3)
Vulnerability rate (%)	6.6	7.9	7.9	8.8	9.0	9.6	20.0	20.9	33.5	36.6	46.8
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(5.0)	(4.1)	(8.8)	(11.5)	(14.6)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	43200.0	41126.5	41141.7	40048.3	39163.7	38266.2	4.8	4.8	7.3	9.3	11.4
	(474.4)	(542.1)	(539.9)	(538.8)	(457.8)	(476.7)	(14.3)	(13.8)	(13.6)	(3.5)	(0.5)
Poverty headcount rate (%)	7.0	8.4	8.6	9.9	10.3	12.0	18.9	22.0	40.3	45.8	71.0
	(0.4)	(0.5)	(0.5)	(0.5)	(0.5)	(0.6)	(29.1)	(29.4)	(37.2)	(39.9)	(44.6)
Poverty gap (%)	2.0	2.1	2.2	2.4	2.5	3.0	6.7	9.8	19.3	25.2	53.6
	(0.1)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(22.0)	(21.9)	(18.1)	(21.0)	(24.8)
USAID poverty gap (%)	28.1	25.3	25.3	23.9	24.2	25.3	10.2	10.0	14.9	14.1	10.1
	(1.0)	(1.1)	(1.1)	(0.9)	(0.9)	(0.8)	(15.7)	(12.5)	(12.2)	(12.0)	(20.9)
Food poverty headcount rate (%)	3.2	3.0	3.1	3.3	3.5	4.3	6.3	3.9	3.1	8.3	35.4
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(5.2)	(5.5)	(5.2)	(7.5)	(10.3)
Vulnerability rate (%)	6.6	7.9	8.0	8.8	9.0	9.7	19.9	21.3	34.3	37.7	47.7
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(5.3)	(4.4)	(8.5)	(11.8)	(14.9)
Adj R-squared	N/A	0.74	0.74	0.70	0.69	0.65					
Obs. (the base survey)	N/A	9399	9399	9399	9399	9399					
Obs. (the target survey)	N/A	9396	9396	9396	9396	9396					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.26. Imputation of welfare indicators in VHLSS 2020 using VHLSS 2012 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	48333.3	49613.5	47908.5	48235.8	42858.7	41657.6	2.6	0.9	0.2	11.3	13.8
	(573.3)	(1464.5)	(997.1)	(1745.4)	(424.8)	(411.5)	(155.5)	(73.9)	(204.5)	(25.9)	(28.2)
Poverty headcount rate (%)	5.0	6.2	6.5	7.4	7.2	8.6	23.7	29.7	48.5	42.7	71.7
	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(30.8)	(33.6)	(39.8)	(38.5)	(48.6)
Poverty gap (%)	1.2	1.4	1.5	1.7	1.7	2.1	16.6	23.3	40.0	35.1	73.0
	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(36.2)	(40.5)	(42.0)	(40.7)	(60.9)
USAID poverty gap (%)	24.7	23.3	23.4	23.2	23.3	24.8	5.7	4.9	5.7	5.3	0.7
	(0.9)	(1.0)	(1.0)	(0.9)	(0.9)	(0.9)	(11.2)	(8.9)	(4.0)	(0.5)	(2.8)
Food poverty headcount rate (%)	1.7	2.0	2.1	2.4	2.3	3.0	12.1	20.6	36.4	31.9	74.2
	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.3)	(27.0)	(30.9)	(33.0)	(31.8)	(48.7)
Vulnerability rate (%)	5.3	6.5	6.6	7.3	7.2	7.7	22.2	24.3	37.4	34.6	44.0
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.4)	(9.1)	(8.6)	(12.8)	(14.4)	(16.7)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	48333.3	49758.7	48073.8	48346.3	43078.9	41926.4	2.9	0.5	0.0	10.9	13.3
	(573.3)	(1805.9)	(916.6)	(1842.3)	(415.0)	(403.7)	(215.0)	(59.9)	(221.4)	(27.6)	(29.6)
Poverty headcount rate (%)	5.0	6.0	6.4	7.4	7.1	8.5	20.7	28.0	47.5	42.5	70.5
	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(25.3)	(24.6)	(35.2)	(34.4)	(43.1)
Poverty gap (%)	1.2	1.4	1.5	1.7	1.6	2.1	11.9	19.1	36.7	33.0	71.0
	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(17.0)	(15.8)	(29.0)	(27.1)	(44.0)
USAID poverty gap (%)	24.7	22.9	23.0	22.9	23.0	24.7	7.3	6.9	7.3	6.6	0.4
	(0.9)	(0.9)	(0.9)	(0.8)	(0.9)	(0.8)	(1.3)	(1.5)	(10.8)	(7.4)	(11.6)
Food poverty headcount rate (%)	1.7	1.9	2.0	2.3	2.2	3.0	7.2	14.7	30.8	28.1	71.7
	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(10.7)	(9.6)	(22.0)	(19.2)	(36.4)
Vulnerability rate (%)	5.3	6.5	6.6	7.3	7.1	7.7	22.5	23.9	36.4	33.1	43.7
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.4)	(8.9)	(8.6)	(11.7)	(12.9)	(16.2)
Adj R-squared	N/A	0.74	0.74	0.70	0.69	0.65					
Obs. (the base survey)	N/A	9399	9399	9399	9399	9399					
Obs. (the target survey)	N/A	9389	9389	9389	9389	9389					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.27. Imputation of welfare indicators in VHLSS 2022 using VHLSS 2012 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	45657.9	50530.8	49035.3	50099.3	44941.4	43059.0	10.7	7.4	9.7	1.6	5.7
	(693.8)	(1087.6)	(822.4)	(1250.5)	(442.6)	(425.5)	(56.7)	(18.5)	(80.2)	(36.2)	(38.7)
Poverty headcount rate (%)	6.2	5.4	5.8	5.9	5.9	7.6	13.1	5.8	4.1	5.4	23.0
	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(17.6)	(21.6)	(18.1)	(18.2)	(32.2)
Poverty gap (%)	1.6	1.3	1.4	1.3	1.3	1.9	22.2	13.8	16.4	17.3	17.5
	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(1.4)	(6.9)	(0.2)	(0.7)	(20.8)
USAID poverty gap (%)	26.0	23.3	23.8	22.7	22.7	24.9	10.4	8.4	12.8	12.6	4.4
	(1.1)	(1.1)	(1.1)	(1.0)	(1.0)	(1.0)	(1.3)	(1.5)	(7.3)	(5.6)	(10.6)
Food poverty headcount rate (%)	2.4	1.7	1.9	1.8	1.8	2.7	26.9	17.6	22.4	23.5	14.0
	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.3)	(3.8)	(9.5)	(2.2)	(1.5)	(23.2)
Vulnerability rate (%)	5.3	5.7	5.9	6.2	6.1	6.9	6.9	10.5	15.6	15.2	29.9
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(20.4)	(20.4)	(22.1)	(26.0)	(30.0)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	45657.9	50721.7	49218.0	50284.4	45152.5	43309.0	11.1	7.8	10.1	1.1	5.1
	(693.8)	(1338.2)	(886.7)	(1427.0)	(456.0)	(434.5)	(92.9)	(27.8)	(105.7)	(34.3)	(37.4)
Poverty headcount rate (%)	6.2	5.3	5.8	5.9	5.8	7.6	14.3	7.2	5.7	6.2	22.6
	(0.3)	(0.4)	(0.5)	(0.4)	(0.4)	(0.5)	(35.2)	(41.1)	(31.8)	(32.0)	(45.2)
Poverty gap (%)	1.6	1.2	1.4	1.3	1.3	1.9	24.3	15.7	17.3	17.5	17.2
	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.2)	(14.5)	(25.0)	(9.4)	(9.1)	(33.5)
USAID poverty gap (%)	26.0	23.0	23.7	22.8	22.9	24.9	11.6	9.1	12.3	12.0	4.3
	(1.1)	(1.1)	(1.1)	(1.0)	(1.0)	(1.0)	(0.7)	(0.1)	(10.0)	(9.5)	(11.9)
Food poverty headcount rate (%)	2.4	1.7	1.9	1.8	1.8	2.7	29.3	19.9	23.6	23.2	14.2
	(0.2)	(0.2)	(0.3)	(0.2)	(0.2)	(0.3)	(17.3)	(28.1)	(10.5)	(10.6)	(35.9)
Vulnerability rate (%)	5.3	5.7	5.9	6.2	6.2	6.9	6.2	10.5	16.3	15.8	29.7
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(23.7)	(24.9)	(25.5)	(29.2)	(32.0)
Adj R-squared	N/A	0.74	0.74	0.70	0.69	0.65					
Obs. (the base survey)	N/A	9399	9399	9399	9399	9399					
Obs. (the target survey)	N/A	9398	9398	9398	9398	9398					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.28. Imputation of welfare indicators in VHLSS 2010 using VHLSS 2014 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	30886.1	28905.4	28982.5	29462.6	28772.3	29676.8	6.4	6.2	4.6	6.8	3.9
	(404.5)	(403.0)	(391.9)	(388.4)	(333.9)	(326.4)	(0.4)	(3.1)	(4.0)	(17.4)	(19.3)
Poverty headcount rate (%)	20.7	23.0	22.6	21.9	21.1	19.4	10.9	8.9	5.4	1.8	6.7
	(0.5)	(0.7)	(0.7)	(0.6)	(0.6)	(0.6)	(30.6)	(28.4)	(22.2)	(20.7)	(13.1)
Poverty gap (%)	5.9	6.7	6.6	5.9	5.6	5.1	14.2	11.3	0.1	4.3	12.8
	(0.2)	(0.3)	(0.3)	(0.2)	(0.2)	(0.2)	(45.0)	(41.2)	(15.7)	(12.2)	(4.9)
USAID poverty gap (%)	28.4	29.2	29.0	27.0	26.7	26.5	3.0	2.2	5.0	6.0	6.6
	(0.5)	(0.7)	(0.7)	(0.5)	(0.6)	(0.6)	(27.9)	(26.5)	(1.6)	(2.8)	(7.4)
Food poverty headcount rate (%)	8.9	10.1	9.8	8.8	8.3	7.5	12.7	9.7	2.1	7.1	15.9
	(0.4)	(0.5)	(0.5)	(0.4)	(0.4)	(0.4)	(32.5)	(29.7)	(12.2)	(8.8)	(1.3)
Vulnerability rate (%)	14.9	14.2	14.1	14.3	14.4	13.8	4.5	4.8	3.8	3.2	7.3
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(4.0)	(3.5)	(2.1)	(3.2)	(0.7)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	30886.1	29011.2	29084.0	29541.0	28913.2	29954.8	6.1	5.8	4.4	6.4	3.0
	(404.5)	(441.7)	(428.0)	(434.0)	(377.4)	(380.9)	(9.2)	(5.8)	(7.3)	(6.7)	(5.8)
Poverty headcount rate (%)	20.7	23.0	22.6	21.8	21.1	19.2	10.7	8.7	5.3	1.9	7.6
	(0.5)	(0.7)	(0.7)	(0.6)	(0.6)	(0.6)	(28.5)	(26.5)	(20.6)	(18.8)	(12.6)
Poverty gap (%)	5.9	6.6	6.5	5.8	5.6	5.0	12.7	9.8	1.2	5.6	15.1
	(0.2)	(0.3)	(0.3)	(0.2)	(0.2)	(0.2)	(44.1)	(40.2)	(13.2)	(9.2)	(2.4)
USAID poverty gap (%)	28.4	28.9	28.7	26.6	26.3	26.1	1.8	1.0	6.2	7.3	8.1
	(0.5)	(0.7)	(0.7)	(0.5)	(0.6)	(0.6)	(33.6)	(32.9)	(2.7)	(4.5)	(8.6)
Food poverty headcount rate (%)	8.9	9.9	9.6	8.6	8.2	7.3	10.5	7.7	3.8	8.5	18.5
	(0.4)	(0.5)	(0.5)	(0.4)	(0.4)	(0.4)	(32.2)	(28.9)	(11.1)	(7.2)	(0.7)
Vulnerability rate (%)	14.9	14.6	14.5	14.6	14.7	14.3	1.9	2.7	1.9	1.0	3.5
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(5.3)	(4.5)	(3.1)	(4.3)	(2.5)
Adj R-squared	N/A	0.74	0.73	0.67	0.64	0.58					
Obs. (the base survey)	N/A	9393	9393	9393	9393	9393					
Obs. (the target survey)	N/A	9399	9399	9399	9399	9399					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.29. Imputation of welfare indicators in VHLSS 2012 using VHLSS 2014 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	31772.4	30661.3	30604.9	31171.7	30317.8	30862.5	3.5	3.7	1.9	4.6	2.9
	(340.0)	(372.5)	(361.3)	(370.8)	(318.6)	(312.1)	(9.5)	(6.3)	(9.0)	(6.3)	(8.2)
Poverty headcount rate (%)	17.2	19.3	19.4	19.0	18.4	17.5	12.4	12.7	10.6	7.2	1.5
	(0.5)	(0.7)	(0.7)	(0.6)	(0.6)	(0.6)	(35.1)	(33.5)	(28.6)	(26.5)	(20.9)
Poverty gap (%)	4.5	5.6	5.5	5.0	4.8	4.6	25.3	24.0	12.3	7.8	2.0
	(0.2)	(0.3)	(0.3)	(0.2)	(0.2)	(0.2)	(76.5)	(72.9)	(38.7)	(34.6)	(25.7)
USAID poverty gap (%)	26.0	28.9	28.6	26.4	26.1	26.1	11.5	10.1	1.6	0.6	0.5
	(0.5)	(0.8)	(0.8)	(0.6)	(0.6)	(0.6)	(55.7)	(53.7)	(14.9)	(16.8)	(15.3)
Food poverty headcount rate (%)	6.4	8.3	8.2	7.4	7.1	6.7	29.3	27.8	15.0	9.9	3.4
	(0.3)	(0.5)	(0.5)	(0.4)	(0.4)	(0.4)	(53.7)	(51.4)	(32.5)	(28.8)	(19.5)
Vulnerability rate (%)	13.4	13.0	13.0	13.2	13.3	13.0	3.3	3.1	1.4	1.0	3.4
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(5.6)	(5.0)	(3.7)	(4.8)	(3.3)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	31772.4	30778.6	30716.2	31248.8	30463.5	31140.5	3.1	3.3	1.6	4.1	2.0
	(340.0)	(415.1)	(408.2)	(415.0)	(357.3)	(358.6)	(22.1)	(20.0)	(22.1)	(5.1)	(5.5)
Poverty headcount rate (%)	17.2	19.3	19.3	19.0	18.4	17.4	12.0	12.2	10.4	7.1	0.9
	(0.5)	(0.7)	(0.7)	(0.6)	(0.6)	(0.6)	(33.9)	(32.4)	(27.8)	(26.2)	(22.7)
Poverty gap (%)	4.5	5.5	5.5	4.9	4.7	4.4	23.2	22.2	10.7	6.3	0.4
	(0.2)	(0.3)	(0.3)	(0.2)	(0.2)	(0.2)	(62.6)	(60.5)	(36.3)	(31.1)	(26.7)
USAID poverty gap (%)	26.0	28.5	28.3	26.0	25.7	25.6	10.0	8.9	0.3	0.8	1.3
	(0.5)	(0.8)	(0.8)	(0.6)	(0.6)	(0.7)	(41.9)	(41.2)	(15.6)	(16.9)	(20.8)
Food poverty headcount rate (%)	6.4	8.2	8.1	7.3	6.9	6.5	26.7	25.2	13.0	7.8	0.3
	(0.3)	(0.5)	(0.5)	(0.4)	(0.4)	(0.4)	(46.9)	(45.6)	(30.2)	(25.8)	(20.3)
Vulnerability rate (%)	13.4	13.3	13.3	13.5	13.6	13.4	0.9	0.7	0.3	0.9	0.3
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(6.9)	(7.7)	(7.3)	(8.5)	(6.6)
Adj R-squared	N/A	0.74	0.73	0.67	0.64	0.58					
Obs. (the base survey)	N/A	9393	9393	9393	9393	9393					
Obs. (the target survey)	N/A	9399	9399	9399	9399	9399					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.30. Imputation of welfare indicators in VHLSS 2016 using VHLSS 2014 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	38827.2	36671.5	36448.3	36092.0	34972.9	34904.9	5.6	6.1	7.0	9.9	10.1
	(418.4)	(490.3)	(473.8)	(444.6)	(390.5)	(379.7)	(17.2)	(13.2)	(6.2)	(6.7)	(9.3)
Poverty headcount rate (%)	9.8	12.4	12.7	14.1	14.0	13.9	27.0	29.8	44.2	43.0	42.2
	(0.4)	(0.7)	(0.7)	(0.7)	(0.7)	(0.7)	(58.7)	(58.6)	(52.4)	(50.9)	(49.9)
Poverty gap (%)	2.6	3.5	3.6	3.7	3.7	3.7	34.8	37.3	44.5	43.0	42.5
	(0.2)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(105.8)	(107.5)	(61.6)	(58.8)	(63.5)
USAID poverty gap (%)	26.5	28.1	28.0	26.6	26.5	26.6	6.2	5.8	0.2	0.0	0.2
	(0.8)	(1.3)	(1.3)	(0.9)	(0.9)	(0.9)	(60.9)	(60.6)	(4.0)	(4.8)	(13.1)
Food poverty headcount rate (%)	3.8	5.2	5.2	5.5	5.5	5.4	34.9	37.4	45.1	43.4	42.6
	(0.3)	(0.6)	(0.6)	(0.5)	(0.5)	(0.5)	(83.4)	(84.6)	(53.7)	(51.1)	(51.8)
Vulnerability rate (%)	8.5	9.6	9.8	10.3	10.4	10.5	12.8	14.3	20.9	21.9	23.2
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(7.9)	(7.6)	(7.8)	(8.8)	(8.4)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	38827.2	36811.1	36582.5	36181.9	35138.8	35218.2	5.2	5.8	6.8	9.5	9.3
	(418.4)	(475.7)	(471.1)	(470.1)	(407.3)	(412.5)	(13.7)	(12.6)	(12.3)	(2.7)	(1.4)
Poverty headcount rate (%)	9.8	12.2	12.5	14.0	13.9	13.8	24.7	28.2	43.1	42.0	40.8
	(0.4)	(0.5)	(0.6)	(0.6)	(0.6)	(0.6)	(25.3)	(26.5)	(28.9)	(28.6)	(26.3)
Poverty gap (%)	2.6	3.4	3.5	3.7	3.6	3.6	31.4	33.8	41.8	40.6	38.9
	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(36.3)	(36.9)	(23.0)	(21.2)	(17.0)
USAID poverty gap (%)	26.5	27.9	27.7	26.3	26.3	26.2	5.4	4.4	0.9	1.0	1.3
	(0.8)	(1.0)	(1.0)	(0.7)	(0.7)	(0.7)	(17.5)	(15.8)	(13.0)	(12.3)	(12.4)
Food poverty headcount rate (%)	3.8	5.0	5.1	5.4	5.4	5.3	30.9	32.6	41.3	40.3	37.6
	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.3)	(27.0)	(27.6)	(20.9)	(19.0)	(14.2)
Vulnerability rate (%)	8.5	9.9	10.0	10.5	10.6	10.8	15.7	16.8	23.3	24.0	26.1
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(7.3)	(6.9)	(7.7)	(10.3)	(9.2)
Adj R-squared	N/A	0.74	0.73	0.67	0.64	0.58					
Obs. (the base survey)	N/A	9393	9393	9393	9393	9393					
Obs. (the target survey)	N/A	9399	9399	9399	9399	9399					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.31. Imputation of welfare indicators in VHLSS 2018 using VHLSS 2014 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	43200.0	40039.4	39762.1	38952.4	37443.4	36898.8	7.3	8.0	9.8	13.3	14.6
	(474.4)	(515.6)	(494.8)	(505.6)	(426.5)	(429.0)	(8.7)	(4.3)	(6.6)	(10.1)	(9.6)
Poverty headcount rate (%)	7.0	9.6	9.8	10.8	11.0	12.4	37.2	39.2	53.1	57.1	76.1
	(0.4)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(35.7)	(36.1)	(36.9)	(38.4)	(41.6)
Poverty gap (%)	2.0	2.7	2.7	2.7	2.8	3.2	35.4	35.5	36.9	40.9	63.0
	(0.1)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(43.8)	(41.5)	(20.3)	(21.2)	(28.4)
USAID poverty gap (%)	28.1	27.8	27.4	25.2	25.2	26.1	1.3	2.6	10.6	10.3	7.4
	(1.0)	(1.1)	(1.1)	(0.8)	(0.8)	(0.8)	(16.9)	(12.5)	(18.4)	(18.7)	(20.6)
Food poverty headcount rate (%)	3.2	3.9	3.9	3.9	4.0	4.7	22.3	22.0	21.3	25.2	46.1
	(0.3)	(0.4)	(0.4)	(0.3)	(0.3)	(0.3)	(21.2)	(20.3)	(7.6)	(8.5)	(14.1)
Vulnerability rate (%)	6.6	8.0	8.1	8.9	9.2	9.7	21.4	23.4	36.1	40.6	47.9
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(4.3)	(4.3)	(7.3)	(10.2)	(12.1)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	43200.0	40215.6	39929.2	39084.1	37658.1	37275.9	6.9	7.6	9.5	12.8	13.7
	(474.4)	(547.6)	(536.7)	(528.2)	(457.1)	(477.0)	(15.4)	(13.1)	(11.3)	(3.6)	(0.5)
Poverty headcount rate (%)	7.0	9.5	9.6	10.6	10.9	12.2	34.5	36.8	51.4	55.3	73.9
	(0.4)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(51.4)	(51.7)	(49.8)	(52.6)	(54.2)
Poverty gap (%)	2.0	2.6	2.6	2.7	2.7	3.1	31.9	32.3	34.0	37.9	58.5
	(0.1)	(0.3)	(0.2)	(0.2)	(0.2)	(0.2)	(76.9)	(74.6)	(37.3)	(37.8)	(45.3)
USAID poverty gap (%)	28.1	27.6	27.2	24.9	25.0	25.7	1.9	3.3	11.5	11.2	8.8
	(1.0)	(1.6)	(1.5)	(0.9)	(0.9)	(0.9)	(59.0)	(54.0)	(6.6)	(8.6)	(8.8)
Food poverty headcount rate (%)	3.2	3.8	3.8	3.8	3.9	4.6	19.6	18.9	18.7	22.3	41.9
	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(42.6)	(42.3)	(22.8)	(23.4)	(28.3)
Vulnerability rate (%)	6.6	7.9	8.1	8.9	9.2	9.8	20.8	22.9	35.7	40.2	49.0
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(9.1)	(7.8)	(10.5)	(14.2)	(15.4)
Adj R-squared	N/A	0.74	0.73	0.67	0.64	0.58					
Obs. (the base survey)	N/A	9393	9393	9393	9393	9393					
Obs. (the target survey)	N/A	9396	9396	9396	9396	9396					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.32. Imputation of welfare indicators in VHLSS 2020 using VHLSS 2014 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	48333.3	50137.8	48051.2	51927.4	40952.4	40132.3	3.7	0.6	7.4	15.3	17.0
	(573.3)	(2166.9)	(1351.2)	(4238.8)	(420.9)	(411.0)	(278.0)	(135.7)	(639.4)	(26.6)	(28.3)
Poverty headcount rate (%)	5.0	7.4	7.7	8.5	8.0	9.3	47.6	53.2	69.8	60.4	86.4
	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.5)	(46.4)	(48.4)	(51.2)	(47.4)	(54.3)
Poverty gap (%)	1.2	1.9	1.9	2.1	1.9	2.4	52.1	55.8	66.2	56.4	92.6
	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(59.1)	(59.0)	(56.1)	(50.1)	(65.9)
USAID poverty gap (%)	24.7	25.4	25.1	24.1	24.0	25.5	3.0	1.7	2.1	2.5	3.3
	(0.9)	(1.0)	(0.9)	(0.8)	(0.9)	(0.8)	(5.2)	(1.2)	(10.5)	(7.2)	(9.6)
Food poverty headcount rate (%)	1.7	2.7	2.7	2.9	2.7	3.4	54.0	57.0	65.6	55.5	96.8
	(0.2)	(0.3)	(0.3)	(0.3)	(0.2)	(0.3)	(46.2)	(46.6)	(46.1)	(40.4)	(53.9)
Vulnerability rate (%)	5.3	6.9	7.1	7.8	7.6	8.0	28.6	32.4	46.6	42.2	49.0
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(10.2)	(10.8)	(14.5)	(15.5)	(15.9)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	48333.3	50276.4	48186.9	51987.8	41157.5	40520.4	4.0	0.3	7.6	14.8	16.2
	(573.3)	(1690.8)	(1092.3)	(2934.6)	(455.0)	(458.7)	(194.9)	(90.5)	(411.9)	(20.6)	(20.0)
Poverty headcount rate (%)	5.0	7.3	7.5	8.4	7.9	9.1	44.7	50.5	67.1	57.9	82.5
	(0.3)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(60.3)	(61.0)	(65.6)	(63.0)	(69.1)
Poverty gap (%)	1.2	1.8	1.9	2.0	1.9	2.3	46.3	50.1	61.1	51.7	86.3
	(0.1)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(77.2)	(76.6)	(80.5)	(74.9)	(87.7)
USAID poverty gap (%)	24.7	24.9	24.6	23.8	23.7	25.2	1.1	0.2	3.6	3.9	2.1
	(0.9)	(1.0)	(1.0)	(0.9)	(0.9)	(0.9)	(8.0)	(3.9)	(5.1)	(1.7)	(6.3)
Food poverty headcount rate (%)	1.7	2.6	2.6	2.8	2.6	3.3	46.8	49.9	59.2	50.0	89.5
	(0.2)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(63.1)	(63.9)	(67.7)	(62.7)	(74.2)
Vulnerability rate (%)	5.3	6.8	7.1	7.8	7.5	7.9	27.7	32.6	46.8	41.3	48.1
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.4)	(11.1)	(12.2)	(14.2)	(15.8)	(16.6)
Adj R-squared	N/A	0.74	0.73	0.67	0.64	0.58					
Obs. (the base survey)	N/A	9393	9393	9393	9393	9393					
Obs. (the target survey)	N/A	9389	9389	9389	9389	9389					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.33. Imputation of welfare indicators in VHLSS 2022 using VHLSS 2014 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	45657.9	50250.7	48508.9	51796.4	42844.4	41304.0	10.1	6.2	13.4	6.2	9.5
	(693.8)	(1369.8)	(1031.9)	(2069.2)	(439.1)	(426.3)	(97.4)	(48.7)	(198.2)	(36.7)	(38.6)
Poverty headcount rate (%)	6.2	6.7	7.1	6.9	6.7	8.4	7.5	14.2	10.7	8.1	35.6
	(0.3)	(0.4)	(0.5)	(0.4)	(0.4)	(0.4)	(30.0)	(35.6)	(24.5)	(23.5)	(33.2)
Poverty gap (%)	1.6	1.7	1.8	1.6	1.6	2.1	6.8	12.3	0.2	2.6	32.4
	(0.1)	(0.2)	(0.2)	(0.1)	(0.1)	(0.1)	(27.3)	(31.5)	(10.6)	(7.7)	(24.3)
USAID poverty gap (%)	26.0	25.9	25.6	23.6	23.5	25.4	0.6	1.6	9.5	9.9	2.3
	(1.1)	(1.1)	(1.1)	(1.0)	(1.0)	(0.9)	(4.9)	(0.3)	(8.6)	(7.6)	(12.6)
Food poverty headcount rate (%)	2.4	2.5	2.6	2.2	2.2	3.1	6.3	11.5	5.4	8.2	30.7
	(0.2)	(0.3)	(0.3)	(0.2)	(0.2)	(0.3)	(27.9)	(32.1)	(13.3)	(10.4)	(26.8)
Vulnerability rate (%)	5.3	6.1	6.4	6.6	6.6	7.3	14.5	20.1	24.7	23.6	36.3
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(22.1)	(24.6)	(25.3)	(30.0)	(32.2)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	45657.9	50413.9	48670.3	51871.7	43058.4	41684.1	10.4	6.6	13.6	5.7	8.7
	(693.8)	(1817.9)	(1203.2)	(3071.3)	(469.7)	(454.6)	(162.0)	(73.4)	(342.7)	(32.3)	(34.5)
Poverty headcount rate (%)	6.2	6.5	6.9	6.7	6.5	8.2	4.7	11.6	8.0	5.2	32.6
	(0.3)	(0.5)	(0.5)	(0.4)	(0.4)	(0.5)	(39.6)	(42.6)	(31.0)	(29.9)	(41.3)
Poverty gap (%)	1.6	1.7	1.8	1.6	1.5	2.1	3.9	9.2	3.0	5.3	28.5
	(0.1)	(0.2)	(0.2)	(0.1)	(0.1)	(0.2)	(42.2)	(43.5)	(13.7)	(10.5)	(30.2)
USAID poverty gap (%)	26.0	25.8	25.5	23.4	23.4	25.2	0.8	2.1	10.1	10.0	3.1
	(1.1)	(1.2)	(1.2)	(1.0)	(1.0)	(1.0)	(15.0)	(10.4)	(10.9)	(10.7)	(11.5)
Food poverty headcount rate (%)	2.4	2.4	2.5	2.2	2.1	3.0	3.2	8.2	8.2	10.4	26.1
	(0.2)	(0.3)	(0.3)	(0.2)	(0.2)	(0.3)	(43.3)	(45.0)	(16.6)	(13.3)	(32.7)
Vulnerability rate (%)	5.3	6.0	6.4	6.7	6.7	7.3	13.5	19.9	26.7	25.3	37.5
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.4)	(22.8)	(25.5)	(26.5)	(31.0)	(35.5)
Adj R-squared	N/A	0.74	0.73	0.67	0.64	0.58					
Obs. (the base survey)	N/A	9393	9393	9393	9393	9393					
Obs. (the target survey)	N/A	9398	9398	9398	9398	9398					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.34. Imputation of welfare indicators in VHLSS 2010 using VHLSS 2016 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	30886.1	30069.5	30349.2	31298.6	30801.0	31792.3	2.6	1.7	1.3	0.3	2.9
	(404.5)	(380.2)	(381.9)	(385.2)	(351.7)	(351.6)	(6.0)	(5.6)	(4.8)	(13.1)	(13.1)
Poverty headcount rate (%)	20.7	20.2	19.5	17.6	17.2	15.7	2.7	6.1	15.2	17.0	24.1
	(0.5)	(0.6)	(0.6)	(0.6)	(0.6)	(0.5)	(23.8)	(21.3)	(10.9)	(10.2)	(4.1)
Poverty gap (%)	5.9	5.8	5.5	4.5	4.4	4.0	1.2	5.8	24.0	26.1	32.4
	(0.2)	(0.3)	(0.3)	(0.2)	(0.2)	(0.2)	(29.8)	(26.2)	(3.2)	(4.8)	(9.2)
USAID poverty gap (%)	28.4	28.8	28.5	25.4	25.3	25.3	1.6	0.3	10.4	10.9	11.0
	(0.5)	(0.7)	(0.7)	(0.6)	(0.6)	(0.6)	(28.8)	(30.6)	(9.2)	(11.5)	(18.8)
Food poverty headcount rate (%)	8.9	8.7	8.2	6.4	6.3	5.7	2.9	8.3	28.0	30.0	36.4
	(0.4)	(0.5)	(0.5)	(0.4)	(0.4)	(0.3)	(19.9)	(16.9)	(6.0)	(7.8)	(12.6)
Vulnerability rate (%)	14.9	13.4	13.3	13.3	13.2	12.6	9.8	10.7	10.8	11.1	15.0
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(2.5)	(1.8)	(0.3)	(1.1)	(1.7)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	30886.1	30205.5	30503.1	31464.4	30989.2	32052.6	2.2	1.2	1.9	0.3	3.8
	(404.5)	(443.3)	(434.3)	(423.4)	(383.6)	(381.1)	(9.6)	(7.4)	(4.7)	(5.2)	(5.8)
Poverty headcount rate (%)	20.7	20.1	19.4	17.5	17.2	15.6	3.2	6.7	15.6	17.3	24.7
	(0.5)	(0.7)	(0.6)	(0.6)	(0.6)	(0.5)	(25.7)	(23.2)	(10.3)	(9.4)	(3.7)
Poverty gap (%)	5.9	5.7	5.4	4.4	4.3	3.9	3.2	7.6	25.5	27.2	33.8
	(0.2)	(0.3)	(0.3)	(0.2)	(0.2)	(0.2)	(37.9)	(34.6)	(5.0)	(6.8)	(10.2)
USAID poverty gap (%)	28.4	28.4	28.1	25.0	25.0	25.0	0.0	0.9	11.7	12.0	12.1
	(0.5)	(0.8)	(0.8)	(0.6)	(0.6)	(0.7)	(44.0)	(46.0)	(11.1)	(13.0)	(21.6)
Food poverty headcount rate (%)	8.9	8.4	8.0	6.3	6.1	5.5	5.7	10.8	29.9	31.6	38.1
	(0.4)	(0.5)	(0.5)	(0.4)	(0.4)	(0.3)	(26.4)	(22.9)	(7.5)	(9.3)	(13.1)
Vulnerability rate (%)	14.9	13.7	13.6	13.5	13.5	12.9	7.6	8.5	9.1	9.4	13.0
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(4.6)	(3.9)	(1.8)	(2.9)	(0.0)
Adj R-squared	N/A	0.75	0.74	0.69	0.68	0.63					
Obs. (the base survey)	N/A	9399	9399	9399	9399	9399					
Obs. (the target survey)	N/A	9399	9399	9399	9399	9399					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.35. Imputation of welfare indicators in VHLSS 2012 using VHLSS 2016 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	31772.4	31988.6	32137.1	33144.2	32549.8	33213.7	0.7	1.1	4.3	2.4	4.5
	(340.0)	(406.2)	(414.3)	(425.4)	(382.4)	(371.1)	(19.5)	(21.9)	(25.1)	(12.4)	(9.1)
Poverty headcount rate (%)	17.2	16.5	16.3	14.9	14.6	13.8	4.0	5.4	13.2	15.1	19.6
	(0.5)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(29.9)	(28.2)	(19.9)	(18.9)	(15.1)
Poverty gap (%)	4.5	4.7	4.6	3.7	3.6	3.4	5.3	2.3	17.3	19.4	23.8
	(0.2)	(0.3)	(0.3)	(0.2)	(0.2)	(0.2)	(60.1)	(58.6)	(19.4)	(17.1)	(12.7)
USAID poverty gap (%)	26.0	28.5	28.1	24.7	24.6	24.6	9.8	8.1	4.8	5.1	5.1
	(0.5)	(0.9)	(0.9)	(0.7)	(0.7)	(0.7)	(62.4)	(68.7)	(26.1)	(28.4)	(33.0)
Food poverty headcount rate (%)	6.4	6.9	6.7	5.3	5.1	4.8	7.8	4.3	18.3	20.4	24.9
	(0.3)	(0.5)	(0.5)	(0.4)	(0.4)	(0.3)	(41.2)	(37.9)	(12.3)	(10.2)	(5.3)
Vulnerability rate (%)	13.4	11.9	12.0	12.0	12.0	11.6	11.1	10.9	10.6	11.0	13.4
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(5.5)	(5.9)	(4.8)	(5.4)	(3.7)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	31772.4	32165.8	32323.1	33333.3	32759.8	33488.7	1.2	1.7	4.9	3.1	5.4
	(340.0)	(428.2)	(431.7)	(423.5)	(380.0)	(374.7)	(25.9)	(27.0)	(24.6)	(11.7)	(10.2)
Poverty headcount rate (%)	17.2	16.3	16.1	14.9	14.5	13.7	5.1	6.3	13.6	15.5	20.2
	(0.5)	(0.7)	(0.7)	(0.6)	(0.6)	(0.6)	(33.1)	(32.9)	(18.7)	(17.9)	(14.0)
Poverty gap (%)	4.5	4.6	4.5	3.6	3.5	3.3	3.0	0.2	19.0	20.8	25.5
	(0.2)	(0.3)	(0.3)	(0.2)	(0.2)	(0.2)	(65.5)	(65.0)	(13.5)	(11.5)	(5.7)
USAID poverty gap (%)	26.0	28.2	27.8	24.3	24.3	24.2	8.5	6.9	6.2	6.3	6.7
	(0.5)	(0.9)	(0.9)	(0.6)	(0.7)	(0.7)	(63.6)	(65.6)	(18.8)	(21.0)	(23.7)
Food poverty headcount rate (%)	6.4	6.7	6.5	5.1	5.0	4.6	4.9	1.2	20.9	22.6	27.8
	(0.3)	(0.5)	(0.5)	(0.4)	(0.4)	(0.3)	(48.3)	(47.3)	(9.3)	(7.2)	(2.1)
Vulnerability rate (%)	13.4	12.2	12.2	12.2	12.2	11.9	9.1	9.3	9.1	8.9	11.7
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(10.2)	(8.8)	(7.5)	(8.2)	(5.2)
Adj R-squared	N/A	0.75	0.74	0.69	0.68	0.63					
Obs. (the base survey)	N/A	9399	9399	9399	9399	9399					
Obs. (the target survey)	N/A	9399	9399	9399	9399	9399					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.36. Imputation of welfare indicators in VHLSS 2014 using VHLSS 2016 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	33623.8	34742.4	35122.5	35586.7	34879.6	34985.7	3.3	4.5	5.8	3.7	4.1
	(351.8)	(430.5)	(421.6)	(431.9)	(390.1)	(396.9)	(22.4)	(19.8)	(22.8)	(10.9)	(12.8)
Poverty headcount rate (%)	13.5	12.0	11.9	11.7	11.9	12.2	11.6	12.0	13.2	11.7	9.5
	(0.4)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(15.3)	(16.2)	(9.8)	(11.6)	(11.5)
Poverty gap (%)	3.7	3.2	3.2	2.8	2.9	3.0	14.3	15.0	24.2	22.6	20.7
	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.1)	(24.5)	(26.4)	(3.7)	(3.2)	(6.6)
USAID poverty gap (%)	27.6	26.7	26.6	24.1	24.2	24.2	3.0	3.4	12.7	12.3	12.4
	(0.6)	(0.9)	(0.9)	(0.7)	(0.7)	(0.7)	(50.3)	(50.7)	(10.7)	(11.5)	(9.1)
Food poverty headcount rate (%)	5.5	4.6	4.5	4.0	4.1	4.2	16.8	17.8	28.4	26.5	24.8
	(0.3)	(0.3)	(0.4)	(0.3)	(0.3)	(0.3)	(16.5)	(17.9)	(4.7)	(4.2)	(7.1)
Vulnerability rate (%)	11.0	10.3	10.2	10.4	10.6	10.7	6.0	7.3	4.8	3.7	2.5
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(4.9)	(3.5)	(3.7)	(6.5)	(7.5)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	33623.8	34911.9	35311.8	35772.1	35087.3	35265.7	3.8	5.0	6.4	4.4	4.9
	(351.8)	(421.7)	(430.4)	(441.8)	(409.0)	(420.9)	(19.9)	(22.3)	(25.6)	(16.3)	(19.6)
Poverty headcount rate (%)	13.5	11.6	11.6	11.6	11.8	12.0	14.2	14.3	14.6	12.7	11.0
	(0.4)	(0.6)	(0.5)	(0.5)	(0.5)	(0.6)	(23.8)	(22.8)	(17.7)	(20.3)	(23.9)
Poverty gap (%)	3.7	3.1	3.1	2.7	2.8	2.9	17.6	18.0	26.9	24.9	23.3
	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(34.5)	(33.2)	(4.1)	(5.7)	(8.3)
USAID poverty gap (%)	27.6	26.5	26.4	23.6	23.8	23.8	4.0	4.3	14.4	13.9	13.8
	(0.6)	(1.0)	(1.0)	(0.7)	(0.7)	(0.7)	(62.3)	(61.2)	(18.2)	(19.2)	(21.0)
Food poverty headcount rate (%)	5.5	4.4	4.4	3.8	3.9	4.0	20.5	21.1	31.4	29.7	28.1
	(0.3)	(0.4)	(0.4)	(0.3)	(0.3)	(0.3)	(25.8)	(23.9)	(2.5)	(4.2)	(6.3)
Vulnerability rate (%)	11.0	10.4	10.3	10.5	10.7	10.9	5.0	5.8	4.0	2.9	0.6
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(11.1)	(9.1)	(8.9)	(10.4)	(12.3)
Adj R-squared	N/A	0.75	0.74	0.69	0.68	0.63					
Obs. (the base survey)	N/A	9399	9399	9399	9399	9399					
Obs. (the target survey)	N/A	9399	9399	9399	9399	9399					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.37. Imputation of welfare indicators in VHLSS 2018 using VHLSS 2016 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	43200.0	41643.3	41797.7	41507.9	40451.1	40173.3	3.6	3.2	3.9	6.4	7.0
	(474.4)	(556.7)	(543.3)	(541.0)	(469.8)	(488.6)	(17.4)	(14.5)	(14.0)	(1.0)	(3.0)
Poverty headcount rate (%)	7.0	8.1	7.9	8.0	8.2	9.3	14.5	12.4	13.2	16.1	32.9
	(0.4)	(0.6)	(0.6)	(0.5)	(0.5)	(0.5)	(52.6)	(51.5)	(38.0)	(39.0)	(39.9)
Poverty gap (%)	2.0	2.2	2.2	1.9	1.9	2.3	12.9	8.9	4.9	2.1	16.5
	(0.1)	(0.3)	(0.3)	(0.2)	(0.2)	(0.2)	(97.0)	(92.7)	(26.6)	(27.0)	(31.5)
USAID poverty gap (%)	28.1	27.7	27.3	23.6	23.7	24.7	1.4	3.1	16.0	15.6	12.3
	(1.0)	(1.8)	(1.8)	(1.1)	(1.1)	(1.1)	(86.6)	(84.3)	(12.9)	(12.8)	(8.6)
Food poverty headcount rate (%)	3.2	3.3	3.1	2.6	2.7	3.3	1.3	2.9	18.9	16.0	1.4
	(0.3)	(0.5)	(0.5)	(0.3)	(0.3)	(0.3)	(56.5)	(54.0)	(11.7)	(12.0)	(12.4)
Vulnerability rate (%)	6.6	7.0	7.0	7.6	7.7	8.3	7.2	6.7	15.6	18.2	25.9
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.2)	(1.5)	(2.7)	(4.5)	(7.3)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	43200.0	41905.3	42067.4	41765.8	40734.8	40531.8	3.0	2.6	3.3	5.7	6.2
	(474.4)	(604.4)	(577.9)	(575.0)	(496.0)	(550.2)	(27.4)	(21.8)	(21.2)	(4.5)	(16.0)
Poverty headcount rate (%)	7.0	7.9	7.8	7.9	8.1	9.2	11.9	10.5	11.8	15.0	31.3
	(0.4)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(31.8)	(29.8)	(27.2)	(28.3)	(31.4)
Poverty gap (%)	2.0	2.2	2.1	1.8	1.9	2.2	9.4	5.7	7.6	4.7	13.5
	(0.1)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(33.6)	(30.4)	(9.1)	(9.9)	(13.7)
USAID poverty gap (%)	28.1	27.5	26.9	23.3	23.3	24.3	2.2	4.3	17.3	17.1	13.6
	(1.0)	(1.2)	(1.2)	(1.0)	(1.0)	(0.9)	(26.3)	(26.4)	(1.7)	(1.8)	(8.3)
Food poverty headcount rate (%)	3.2	3.2	3.0	2.5	2.6	3.1	1.8	6.2	22.7	19.7	3.0
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(12.3)	(10.5)	(4.5)	(4.0)	(0.1)
Vulnerability rate (%)	6.6	6.9	6.9	7.6	7.8	8.3	5.9	5.6	15.9	18.4	26.6
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(1.6)	(0.3)	(3.1)	(5.0)	(7.7)
Adj R-squared	N/A	0.75	0.74	0.69	0.68	0.63					
Obs. (the base survey)	N/A	9399	9399	9399	9399	9399					
Obs. (the target survey)	N/A	9396	9396	9396	9396	9396					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.38. Imputation of welfare indicators in VHLSS 2020 using VHLSS 2016 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	48333.3	48427.0	48120.1	49308.5	44304.5	43844.5	0.2	0.4	2.0	8.3	9.3
	(573.3)	(793.6)	(740.8)	(1066.2)	(457.0)	(459.7)	(38.4)	(29.2)	(86.0)	(20.3)	(19.8)
Poverty headcount rate (%)	5.0	5.6	5.8	5.8	5.6	6.7	12.6	15.5	16.2	11.9	32.8
	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(29.5)	(30.6)	(26.1)	(24.3)	(32.7)
Poverty gap (%)	1.2	1.4	1.4	1.3	1.3	1.6	13.2	14.4	6.6	2.4	30.0
	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(48.3)	(46.7)	(30.8)	(28.6)	(45.8)
USAID poverty gap (%)	24.7	24.8	24.4	22.6	22.6	24.1	0.6	0.9	8.3	8.5	2.1
	(0.9)	(1.2)	(1.2)	(1.1)	(1.1)	(1.1)	(29.9)	(25.5)	(15.6)	(19.9)	(17.0)
Food poverty headcount rate (%)	1.7	2.0	2.0	1.8	1.7	2.2	12.4	13.6	1.4	2.3	29.1
	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(34.0)	(33.7)	(20.2)	(18.6)	(32.4)
Vulnerability rate (%)	5.3	5.6	5.8	6.2	6.0	6.4	5.2	9.0	15.6	12.4	20.8
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(2.9)	(3.2)	(5.1)	(5.9)	(7.8)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	48333.3	48689.5	48389.3	49520.3	44566.9	44197.7	0.7	0.1	2.5	7.8	8.6
	(573.3)	(814.2)	(718.9)	(1113.1)	(442.2)	(458.4)	(42.0)	(25.4)	(94.2)	(22.9)	(20.0)
Poverty headcount rate (%)	5.0	5.5	5.6	5.7	5.5	6.5	8.8	12.0	13.0	9.4	30.2
	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(23.1)	(24.4)	(23.0)	(20.8)	(28.3)
Poverty gap (%)	1.2	1.3	1.3	1.3	1.2	1.6	7.7	9.0	1.8	1.5	25.5
	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(23.9)	(22.4)	(16.9)	(13.8)	(30.2)
USAID poverty gap (%)	24.7	24.4	24.0	22.2	22.2	23.8	1.0	2.6	9.9	10.0	3.6
	(0.9)	(1.0)	(1.0)	(1.0)	(1.0)	(1.0)	(13.8)	(9.0)	(4.4)	(8.0)	(4.6)
Food poverty headcount rate (%)	1.7	1.9	1.9	1.7	1.6	2.1	7.4	7.5	4.6	7.3	22.9
	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(17.0)	(15.6)	(9.5)	(6.6)	(21.9)
Vulnerability rate (%)	5.3	5.5	5.8	6.2	6.0	6.4	3.3	7.9	15.3	12.2	19.9
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(4.3)	(4.2)	(5.1)	(6.1)	(8.7)
Adj R-squared	N/A	0.75	0.74	0.69	0.68	0.63					
Obs. (the base survey)	N/A	9399	9399	9399	9399	9399					
Obs. (the target survey)	N/A	9389	9389	9389	9389	9389					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.39. Imputation of welfare indicators in VHLSS 2022 using VHLSS 2016 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	45657.9	49639.7	49145.3	51387.1	46372.0	45286.0	8.7	7.6	12.5	1.6	0.8
	(693.8)	(769.4)	(708.5)	(995.7)	(466.9)	(467.0)	(10.9)	(2.1)	(43.5)	(32.7)	(32.7)
Poverty headcount rate (%)	6.2	5.1	5.4	4.6	4.6	6.0	17.8	12.4	25.7	26.4	3.9
	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(19.0)	(23.2)	(6.4)	(6.1)	(18.1)
Poverty gap (%)	1.6	1.3	1.3	1.0	1.0	1.4	21.1	16.4	36.6	37.4	10.9
	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(11.6)	(14.4)	(10.6)	(11.9)	(6.4)
USAID poverty gap (%)	26.0	25.0	24.8	22.2	22.1	24.1	4.0	4.5	14.6	15.0	7.3
	(1.1)	(1.2)	(1.2)	(1.1)	(1.2)	(1.1)	(11.7)	(7.0)	(5.8)	(7.4)	(2.9)
Food poverty headcount rate (%)	2.4	1.8	1.9	1.4	1.3	2.0	22.8	18.1	42.4	43.2	15.7
	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(13.4)	(16.6)	(8.9)	(10.3)	(8.2)
Vulnerability rate (%)	5.3	4.9	5.2	5.2	5.2	5.8	7.3	1.8	2.2	2.5	8.7
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(12.8)	(15.4)	(14.3)	(17.6)	(21.0)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	45657.9	49912.2	49428.4	51653.8	46667.4	45654.7	9.3	8.3	13.1	2.2	0.0
	(693.8)	(744.6)	(709.3)	(1063.7)	(478.1)	(477.1)	(7.3)	(2.2)	(53.3)	(31.1)	(31.2)
Poverty headcount rate (%)	6.2	5.0	5.3	4.5	4.5	5.9	20.0	13.9	27.0	27.8	5.6
	(0.3)	(0.5)	(0.5)	(0.4)	(0.4)	(0.4)	(37.3)	(42.5)	(16.9)	(15.4)	(27.0)
Poverty gap (%)	1.6	1.2	1.3	1.0	1.0	1.4	23.5	18.6	38.4	38.9	12.8
	(0.1)	(0.2)	(0.2)	(0.1)	(0.1)	(0.1)	(28.1)	(33.7)	(7.3)	(8.2)	(12.3)
USAID poverty gap (%)	26.0	24.9	24.6	21.9	22.0	24.0	4.4	5.4	15.6	15.3	7.6
	(1.1)	(1.2)	(1.2)	(1.1)	(1.1)	(1.1)	(14.6)	(12.4)	(1.8)	(2.6)	(1.7)
Food poverty headcount rate (%)	2.4	1.8	1.9	1.3	1.3	2.0	25.1	21.1	44.9	45.1	16.4
	(0.2)	(0.3)	(0.3)	(0.2)	(0.2)	(0.2)	(32.9)	(38.5)	(6.9)	(7.7)	(14.0)
Vulnerability rate (%)	5.3	4.9	5.1	5.2	5.2	5.8	8.9	3.3	2.8	2.2	9.6
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(15.6)	(18.5)	(18.1)	(21.3)	(23.1)
Adj R-squared	N/A	0.75	0.74	0.69	0.68	0.63					
Obs. (the base survey)	N/A	9399	9399	9399	9399	9399					
Obs. (the target survey)	N/A	9398	9398	9398	9398	9398					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.40. Imputation of welfare indicators in VHLSS 2010 using VHLSS 2018 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	30886.1	30568.9	30866.4	32165.2	31771.8	33971.1	1.0	0.1	4.1	2.9	10.0
	(404.5)	(436.2)	(442.1)	(451.7)	(387.3)	(385.9)	(7.8)	(9.3)	(11.7)	(4.2)	(4.6)
Poverty headcount rate (%)	20.7	19.3	19.1	17.3	16.1	12.4	6.9	7.7	16.4	22.3	40.2
	(0.5)	(0.7)	(0.6)	(0.6)	(0.6)	(0.5)	(25.4)	(24.2)	(13.0)	(9.6)	(3.9)
Poverty gap (%)	5.9	5.7	5.7	4.6	4.2	3.1	2.6	2.6	22.4	28.8	47.6
	(0.2)	(0.3)	(0.3)	(0.2)	(0.2)	(0.2)	(45.1)	(44.1)	(3.2)	(3.0)	(18.2)
USAID poverty gap (%)	28.4	29.7	30.0	26.3	26.0	24.9	4.7	5.6	7.2	8.4	12.4
	(0.5)	(0.8)	(0.8)	(0.6)	(0.6)	(0.7)	(53.8)	(53.1)	(13.1)	(17.8)	(30.1)
Food poverty headcount rate (%)	8.9	8.5	8.5	6.7	6.1	4.4	4.8	4.5	25.1	31.6	51.0
	(0.4)	(0.5)	(0.5)	(0.4)	(0.4)	(0.3)	(27.5)	(27.4)	(0.6)	(6.8)	(21.5)
Vulnerability rate (%)	14.9	12.6	12.4	12.4	12.0	10.7	15.1	16.6	16.6	19.0	27.8
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.5)	(0.9)	(2.8)	(2.5)	(8.2)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	30886.1	30669.8	30991.4	32345.2	32018.8	34320.2	0.7	0.3	4.7	3.7	11.1
	(404.5)	(446.6)	(446.3)	(471.4)	(412.2)	(415.0)	(10.4)	(10.3)	(16.5)	(1.9)	(2.6)
Poverty headcount rate (%)	20.7	19.2	19.1	17.3	16.1	12.2	7.4	7.8	16.6	22.3	41.0
	(0.5)	(0.7)	(0.7)	(0.6)	(0.6)	(0.5)	(25.5)	(24.6)	(17.2)	(13.5)	(2.5)
Poverty gap (%)	5.9	5.6	5.6	4.5	4.1	3.0	4.9	4.2	24.2	30.2	49.7
	(0.2)	(0.3)	(0.3)	(0.2)	(0.2)	(0.2)	(36.4)	(38.4)	(12.9)	(8.0)	(1.2)
USAID poverty gap (%)	28.4	29.2	29.5	25.8	25.5	24.2	2.8	3.9	9.0	10.1	14.7
	(0.5)	(0.7)	(0.7)	(0.7)	(0.7)	(0.8)	(37.6)	(37.8)	(22.1)	(28.7)	(56.4)
Food poverty headcount rate (%)	8.9	8.2	8.3	6.5	5.9	4.1	8.7	7.1	27.2	33.5	53.9
	(0.4)	(0.5)	(0.5)	(0.4)	(0.4)	(0.4)	(24.1)	(26.6)	(8.1)	(2.9)	(8.0)
Vulnerability rate (%)	14.9	13.0	12.7	12.7	12.3	11.0	12.2	14.7	14.3	16.9	26.2
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(2.7)	(0.9)	(2.0)	(2.2)	(7.0)
Adj R-squared	N/A	0.75	0.74	0.68	0.65	0.60	0.00	0.00	0.00	0.00	0.00
Obs. (the base survey)	N/A	9390	9390	9390	9390	9390					
Obs. (the target survey)	N/A	9399	9399	9399	9399	9399					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.41. Imputation of welfare indicators in VHLSS 2012 using VHLSS 2018 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	31772.4	32374.3	32626.5	34085.2	33524.9	35238.1	1.9	2.7	7.3	5.5	10.9
	(340.0)	(438.0)	(441.5)	(468.6)	(394.4)	(389.0)	(28.8)	(29.8)	(37.8)	(16.0)	(14.4)
Poverty headcount rate (%)	17.2	16.1	16.2	15.1	14.0	11.2	6.4	5.7	12.5	18.8	34.8
	(0.5)	(0.6)	(0.6)	(0.6)	(0.5)	(0.5)	(22.0)	(22.5)	(12.6)	(8.3)	(4.9)
Poverty gap (%)	4.5	4.8	4.8	3.9	3.6	2.7	7.3	8.1	13.3	20.3	38.9
	(0.2)	(0.3)	(0.3)	(0.2)	(0.2)	(0.1)	(55.3)	(53.0)	(12.3)	(5.6)	(12.6)
USAID poverty gap (%)	26.0	29.8	29.8	25.7	25.5	24.3	14.7	14.7	0.9	1.8	6.2
	(0.5)	(0.9)	(0.8)	(0.6)	(0.7)	(0.7)	(62.6)	(55.8)	(17.8)	(23.0)	(33.8)
Food poverty headcount rate (%)	6.4	7.0	7.1	5.6	5.2	3.8	9.1	10.7	12.3	19.8	40.5
	(0.3)	(0.4)	(0.4)	(0.3)	(0.3)	(0.3)	(34.2)	(34.1)	(6.6)	(0.3)	(16.4)
Vulnerability rate (%)	13.4	11.3	11.1	11.2	10.8	9.9	15.9	17.1	16.7	19.2	26.2
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(2.2)	(1.7)	(0.5)	(0.1)	(4.4)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	31772.4	32514.7	32781.2	34300.9	33803.2	35608.3	2.3	3.2	8.0	6.4	12.1
	(340.0)	(469.0)	(469.6)	(495.5)	(428.8)	(426.7)	(37.9)	(38.1)	(45.7)	(26.1)	(25.5)
Poverty headcount rate (%)	17.2	15.9	16.1	15.0	13.9	11.0	7.8	6.7	13.0	19.0	36.2
	(0.5)	(0.6)	(0.6)	(0.6)	(0.6)	(0.5)	(26.6)	(27.6)	(20.9)	(16.9)	(6.4)
Poverty gap (%)	4.5	4.7	4.7	3.8	3.5	2.6	4.3	5.8	15.8	22.3	41.6
	(0.2)	(0.3)	(0.3)	(0.2)	(0.2)	(0.2)	(62.5)	(63.3)	(32.1)	(25.0)	(9.4)
USAID poverty gap (%)	26.0	29.4	29.4	25.2	24.9	23.8	13.1	13.4	3.1	4.1	8.4
	(0.5)	(0.9)	(0.9)	(0.7)	(0.8)	(0.8)	(69.0)	(64.4)	(38.9)	(44.0)	(56.7)
Food poverty headcount rate (%)	6.4	6.8	6.9	5.4	5.0	3.6	5.7	7.6	15.9	22.7	43.8
	(0.3)	(0.5)	(0.5)	(0.4)	(0.4)	(0.3)	(42.1)	(43.4)	(24.4)	(17.3)	(2.2)
Vulnerability rate (%)	13.4	11.6	11.4	11.5	11.1	10.2	13.5	15.3	14.5	17.4	23.9
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(4.2)	(1.8)	(0.2)	(0.3)	(4.0)
Adj R-squared	N/A	0.75	0.74	0.68	0.65	0.60					
Obs. (the base survey)	N/A	9390	9390	9390	9390	9390					
Obs. (the target survey)	N/A	9399	9399	9399	9399	9399					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.42. Imputation of welfare indicators in VHLSS 2014 using VHLSS 2018 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	33623.8	35632.7	35916.2	36835.2	36032.7	36982.1	6.0	6.8	9.6	7.2	10.0
	(351.8)	(455.3)	(454.4)	(487.8)	(416.6)	(416.3)	(29.4)	(29.1)	(38.6)	(18.4)	(18.3)
Poverty headcount rate (%)	13.5	11.5	11.7	11.7	11.3	9.8	14.6	13.4	13.7	16.3	27.3
	(0.4)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(10.6)	(12.5)	(6.1)	(5.6)	(2.2)
Poverty gap (%)	3.7	3.3	3.3	2.9	2.9	2.4	12.7	11.6	21.1	23.4	36.9
	(0.2)	(0.2)	(0.2)	(0.1)	(0.1)	(0.1)	(19.5)	(20.6)	(8.0)	(10.3)	(15.1)
USAID poverty gap (%)	27.6	28.2	28.2	25.2	25.2	23.9	2.3	2.1	8.6	8.5	13.2
	(0.6)	(0.9)	(0.9)	(0.7)	(0.7)	(0.8)	(53.7)	(50.3)	(7.5)	(12.8)	(22.9)
Food poverty headcount rate (%)	5.5	4.7	4.8	4.2	4.1	3.3	14.9	13.3	23.4	25.8	40.5
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(9.5)	(11.7)	(9.0)	(11.3)	(15.9)
Vulnerability rate (%)	11.0	9.4	9.3	9.5	9.5	9.1	14.1	15.1	13.2	13.9	17.4
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.3)	(1.3)	(0.4)	(1.6)	(1.3)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	33623.8	35783.1	36089.2	37062.8	36328.0	37358.5	6.4	7.3	10.2	8.0	11.1
	(351.8)	(439.1)	(440.8)	(480.9)	(429.5)	(442.8)	(24.8)	(25.3)	(36.7)	(22.1)	(25.9)
Poverty headcount rate (%)	13.5	11.3	11.5	11.5	11.3	9.6	16.6	14.7	14.8	16.6	28.9
	(0.4)	(0.5)	(0.5)	(0.5)	(0.5)	(0.4)	(14.0)	(15.4)	(6.9)	(6.1)	(0.4)
Poverty gap (%)	3.7	3.1	3.2	2.9	2.8	2.2	15.6	13.8	23.6	25.5	40.1
	(0.2)	(0.2)	(0.2)	(0.1)	(0.1)	(0.1)	(25.6)	(26.8)	(7.8)	(9.7)	(18.5)
USAID poverty gap (%)	27.6	27.9	27.9	24.8	24.6	23.2	1.2	1.1	10.2	10.6	15.8
	(0.6)	(1.0)	(0.9)	(0.7)	(0.7)	(0.7)	(58.4)	(51.7)	(7.9)	(12.3)	(20.2)
Food poverty headcount rate (%)	5.5	4.5	4.6	4.1	4.0	3.0	18.5	16.3	26.0	28.4	44.8
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.2)	(14.2)	(16.3)	(10.0)	(11.4)	(19.4)
Vulnerability rate (%)	11.0	9.6	9.4	9.6	9.5	9.2	12.8	14.5	12.5	13.7	15.9
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(2.8)	(0.9)	(0.4)	(2.3)	(3.0)
Adj R-squared	N/A	0.75	0.74	0.68	0.65	0.60					
Obs. (the base survey)	N/A	9390	9390	9390	9390	9390					
Obs. (the target survey)	N/A	9399	9399	9399	9399	9399					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.43. Imputation of welfare indicators in VHLSS 2016 using VHLSS 2018 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	38827.2	38916.7	39168.1	39649.8	38751.3	39654.6	0.2	0.9	2.1	0.2	2.1
	(418.4)	(483.7)	(499.7)	(508.7)	(449.9)	(438.7)	(15.6)	(19.4)	(21.6)	(7.5)	(4.8)
Poverty headcount rate (%)	9.8	10.2	10.3	11.1	10.5	9.0	4.3	5.2	13.2	7.9	7.6
	(0.4)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(42.9)	(45.7)	(40.7)	(37.3)	(27.6)
Poverty gap (%)	2.6	3.0	3.0	2.9	2.8	2.3	15.7	16.6	12.3	6.8	12.5
	(0.2)	(0.3)	(0.3)	(0.2)	(0.2)	(0.2)	(80.5)	(83.5)	(48.7)	(43.1)	(33.7)
USAID poverty gap (%)	26.5	29.4	29.4	26.3	26.2	25.1	10.9	10.8	0.8	1.0	5.3
	(0.8)	(1.4)	(1.4)	(1.0)	(1.0)	(1.2)	(62.9)	(63.3)	(22.0)	(25.4)	(42.8)
Food poverty headcount rate (%)	3.8	4.4	4.4	4.3	4.1	3.2	15.0	16.1	12.4	6.9	15.6
	(0.3)	(0.5)	(0.5)	(0.4)	(0.4)	(0.4)	(61.0)	(63.5)	(40.5)	(34.9)	(24.8)
Vulnerability rate (%)	8.5	8.0	7.9	8.4	8.2	7.9	6.3	7.2	1.7	4.1	7.3
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(2.3)	(2.5)	(0.9)	(0.7)	(3.2)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	38827.2	39091.1	39365.2	39919.8	39089.5	40086.3	0.7	1.4	2.8	0.7	3.2
	(418.4)	(495.3)	(499.2)	(520.2)	(465.2)	(468.7)	(18.4)	(19.3)	(24.3)	(11.2)	(12.0)
Poverty headcount rate (%)	9.8	10.0	10.1	11.0	10.5	8.9	1.8	3.7	12.1	7.2	9.2
	(0.4)	(0.5)	(0.6)	(0.5)	(0.5)	(0.5)	(24.1)	(26.0)	(24.0)	(20.0)	(10.6)
Poverty gap (%)	2.6	2.9	3.0	2.8	2.7	2.2	12.3	13.9	9.7	4.8	15.9
	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(47.6)	(50.7)	(18.4)	(13.6)	(5.0)
USAID poverty gap (%)	26.5	29.2	29.1	25.9	25.9	24.6	10.3	9.8	2.2	2.2	7.3
	(0.8)	(1.3)	(1.3)	(0.8)	(0.9)	(1.0)	(53.0)	(51.1)	(2.1)	(4.9)	(18.9)
Food poverty headcount rate (%)	3.8	4.3	4.3	4.2	4.0	3.1	11.4	13.0	9.0	4.0	19.7
	(0.3)	(0.4)	(0.4)	(0.3)	(0.3)	(0.3)	(30.7)	(33.0)	(14.4)	(9.9)	(0.1)
Vulnerability rate (%)	8.5	8.1	8.0	8.5	8.3	8.0	5.0	6.0	0.0	2.6	6.5
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(8.1)	(3.9)	(3.1)	(3.6)	(1.6)
Adj R-squared	N/A	0.75	0.74	0.68	0.65	0.60					
Obs. (the base survey)	N/A	9390	9390	9390	9390	9390					
Obs. (the target survey)	N/A	9399	9399	9399	9399	9399					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.44. Imputation of welfare indicators in VHLSS 2020 using VHLSS 2018 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	48333.3	52036.2	52180.6	59686.3	45199.0	45184.3	7.7	8.0	23.5	6.5	6.5
	(573.3)	(1636.9)	(1596.9)	(5550.8)	(483.2)	(477.9)	(185.5)	(178.6)	(868.3)	(15.7)	(16.6)
Poverty headcount rate (%)	5.0	5.8	6.0	6.3	5.7	5.9	16.2	20.1	25.1	14.1	18.6
	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(35.4)	(40.2)	(38.1)	(31.2)	(29.4)
Poverty gap (%)	1.2	1.5	1.6	1.5	1.4	1.4	23.8	25.5	21.3	10.1	16.8
	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(51.8)	(52.9)	(40.4)	(31.6)	(33.4)
USAID poverty gap (%)	24.7	26.3	25.8	23.9	23.8	24.3	6.5	4.5	3.0	3.4	1.5
	(0.9)	(1.2)	(1.1)	(1.0)	(1.0)	(1.1)	(25.1)	(19.7)	(7.2)	(13.9)	(14.9)
Food poverty headcount rate (%)	1.7	2.2	2.2	2.1	1.9	2.0	25.4	27.6	20.2	9.3	16.4
	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(38.1)	(39.7)	(29.8)	(21.7)	(23.1)
Vulnerability rate (%)	5.3	5.4	5.5	6.0	5.5	5.7	0.4	3.8	12.1	3.9	7.1
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(2.8)	(3.8)	(5.4)	(4.2)	(3.4)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	48333.3	52299.3	52468.0	60013.4	45658.7	45770.2	8.2	8.6	24.2	5.5	5.3
	(573.3)	(1795.6)	(1803.8)	(7915.0)	(497.5)	(523.0)	(213.2)	(214.7)	(1280.7)	(13.2)	(8.8)
Poverty headcount rate (%)	5.0	5.7	5.9	6.2	5.6	5.8	12.8	17.8	22.7	11.7	15.0
	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.3)	(19.9)	(24.1)	(24.5)	(19.1)	(17.8)
Poverty gap (%)	1.2	1.5	1.5	1.4	1.3	1.4	18.0	20.3	15.6	4.9	11.1
	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(31.4)	(32.8)	(21.5)	(15.1)	(16.9)
USAID poverty gap (%)	24.7	25.8	25.2	23.2	23.2	23.8	4.7	2.2	5.8	6.1	3.4
	(0.9)	(1.2)	(1.1)	(1.0)	(1.0)	(1.1)	(31.8)	(24.6)	(5.9)	(12.6)	(15.0)
Food poverty headcount rate (%)	1.7	2.1	2.1	2.0	1.8	1.9	18.7	20.5	12.1	1.8	8.8
	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(17.9)	(20.3)	(13.9)	(8.1)	(10.1)
Vulnerability rate (%)	5.3	5.3	5.5	6.0	5.6	5.7	1.0	2.5	11.8	4.5	6.3
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(1.2)	(0.0)	(1.9)	(0.9)	(1.3)
Adj R-squared	N/A	0.75	0.74	0.68	0.65	0.60					
Obs. (the base survey)	N/A	9390	9390	9390	9390	9390					
Obs. (the target survey)	N/A	9389	9389	9389	9389	9389					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.45. Imputation of welfare indicators in VHLSS 2022 using VHLSS 2018 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	45657.9	52055.7	52126.9	58152.7	47170.4	46294.2	14.0	14.2	27.4	3.3	1.4
	(693.8)	(1348.2)	(1397.1)	(4045.9)	(485.0)	(467.6)	(94.3)	(101.4)	(483.1)	(30.1)	(32.6)
Poverty headcount rate (%)	6.2	5.6	5.8	4.9	4.6	5.4	10.2	6.9	20.4	25.1	13.3
	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(24.2)	(27.3)	(13.0)	(9.7)	(14.6)
Poverty gap (%)	1.6	1.5	1.5	1.1	1.1	1.3	7.0	5.4	28.9	33.0	19.1
	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(25.8)	(26.5)	(5.5)	(0.8)	(8.2)
USAID poverty gap (%)	26.0	27.0	26.5	23.3	23.3	24.3	3.6	1.7	10.6	10.5	6.6
	(1.1)	(1.2)	(1.2)	(1.3)	(1.3)	(1.2)	(15.7)	(11.0)	(18.9)	(22.2)	(13.8)
Food poverty headcount rate (%)	2.4	2.2	2.2	1.6	1.5	1.8	5.9	4.8	33.2	37.1	22.8
	(0.2)	(0.3)	(0.3)	(0.2)	(0.2)	(0.2)	(26.4)	(27.1)	(6.1)	(1.8)	(9.0)
Vulnerability rate (%)	5.3	4.9	5.1	5.0	4.8	5.2	8.7	5.0	6.3	9.8	2.9
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(10.6)	(13.7)	(11.0)	(11.5)	(12.9)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	45657.9	52336.2	52425.1	58516.1	47608.5	46825.1	14.6	14.8	28.2	4.3	2.6
	(693.8)	(1037.7)	(985.5)	(2381.5)	(544.7)	(530.0)	(49.6)	(42.0)	(243.2)	(21.5)	(23.6)
Poverty headcount rate (%)	6.2	5.4	5.7	4.8	4.5	5.2	12.4	8.6	22.8	27.2	15.8
	(0.3)	(0.5)	(0.5)	(0.4)	(0.3)	(0.3)	(36.2)	(41.7)	(5.9)	(1.3)	(4.1)
Poverty gap (%)	1.6	1.5	1.5	1.1	1.0	1.3	9.3	7.2	31.3	35.0	22.1
	(0.1)	(0.2)	(0.2)	(0.1)	(0.1)	(0.1)	(29.4)	(36.1)	(11.7)	(16.6)	(10.8)
USAID poverty gap (%)	26.0	26.9	26.4	23.2	23.3	24.1	3.5	1.5	11.0	10.6	7.5
	(1.1)	(1.2)	(1.2)	(1.1)	(1.2)	(1.1)	(12.1)	(9.3)	(3.6)	(8.8)	(5.0)
Food poverty headcount rate (%)	2.4	2.2	2.2	1.5	1.4	1.8	8.2	6.6	35.6	38.7	25.4
	(0.2)	(0.3)	(0.3)	(0.2)	(0.2)	(0.2)	(28.5)	(36.7)	(8.9)	(14.3)	(7.1)
Vulnerability rate (%)	5.3	4.7	5.0	5.0	4.8	5.1	11.7	7.0	6.6	10.7	3.5
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(11.2)	(13.3)	(11.5)	(12.8)	(14.2)
Adj R-squared	N/A	0.75	0.74	0.68	0.65	0.60					
Obs. (the base survey)	N/A	9390	9390	9390	9390	9390					
Obs. (the target survey)	N/A	9398	9398	9398	9398	9398					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.46. Imputation of welfare indicators in VHLSS 2010 using VHLSS 2020 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	30886.1	30743.6	29603.7	30579.6	30588.9	32648.2	0.5	4.2	1.0	1.0	5.7
	(404.5)	(433.9)	(389.3)	(380.0)	(367.9)	(375.1)	(7.3)	(3.8)	(6.0)	(9.1)	(7.3)
Poverty headcount rate (%)	20.7	19.4	19.3	17.0	16.9	13.0	6.5	7.0	17.9	18.5	37.3
	(0.5)	(0.6)	(0.6)	(0.6)	(0.5)	(0.5)	(20.9)	(21.3)	(5.7)	(5.0)	(10.6)
Poverty gap (%)	5.9	5.8	5.8	4.4	4.4	3.2	1.0	0.9	25.3	25.5	46.2
	(0.2)	(0.3)	(0.3)	(0.2)	(0.2)	(0.1)	(35.2)	(35.4)	(8.1)	(8.8)	(26.1)
USAID poverty gap (%)	28.4	30.1	30.3	25.8	25.9	24.3	5.9	6.6	9.0	8.6	14.3
	(0.5)	(0.8)	(0.8)	(0.6)	(0.6)	(0.7)	(48.8)	(51.2)	(16.9)	(18.3)	(32.5)
Food poverty headcount rate (%)	8.9	8.6	8.6	6.4	6.4	4.4	3.5	3.5	28.6	28.9	50.5
	(0.4)	(0.5)	(0.5)	(0.3)	(0.3)	(0.3)	(21.4)	(21.3)	(11.7)	(12.6)	(28.9)
Vulnerability rate (%)	14.9	12.4	12.5	12.6	12.5	11.3	16.3	15.9	15.1	15.9	23.6
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.3)	(0.4)	(1.7)	(1.8)	(7.1)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	30886.1	31087.8	29977.1	30950.6	31078.9	33216.7	0.7	2.9	0.2	0.6	7.5
	(404.5)	(629.4)	(552.3)	(514.5)	(501.2)	(524.2)	(55.6)	(36.5)	(27.2)	(23.9)	(29.6)
Poverty headcount rate (%)	20.7	19.3	19.1	16.9	17.0	12.8	7.1	7.9	18.5	18.2	38.1
	(0.5)	(0.7)	(0.7)	(0.6)	(0.6)	(0.5)	(26.0)	(26.3)	(13.1)	(12.8)	(0.7)
Poverty gap (%)	5.9	5.7	5.7	4.3	4.3	3.1	3.1	2.9	26.6	26.5	47.8
	(0.2)	(0.3)	(0.3)	(0.2)	(0.2)	(0.2)	(48.9)	(52.1)	(5.7)	(5.2)	(9.8)
USAID poverty gap (%)	28.4	29.6	29.9	25.6	25.5	23.9	4.3	5.4	9.9	10.1	15.7
	(0.5)	(0.8)	(0.9)	(0.7)	(0.7)	(0.8)	(56.4)	(62.2)	(26.2)	(25.9)	(49.1)
Food poverty headcount rate (%)	8.9	8.4	8.4	6.2	6.3	4.2	6.5	6.5	30.6	30.1	52.5
	(0.4)	(0.5)	(0.5)	(0.4)	(0.4)	(0.3)	(32.6)	(34.1)	(1.0)	(0.8)	(15.0)
Vulnerability rate (%)	14.9	12.7	12.8	12.8	12.7	11.7	14.2	14.0	13.8	14.3	21.3
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.0)	(1.1)	(0.8)	(1.2)	(4.9)
Adj R-squared	N/A	0.76	0.74	0.68	0.65	0.61					
Obs. (the base survey)	N/A	9071	9071	9071	9071	9071					
Obs. (the target survey)	N/A	9399	9399	9399	9399	9399					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.47. Imputation of welfare indicators in VHLSS 2012 using VHLSS 2020 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	31772.4	32532.4	31415.6	32460.7	32430.9	34106.2	2.4	1.1	2.2	2.1	7.3
	(340.0)	(406.5)	(368.7)	(365.6)	(356.5)	(369.9)	(19.6)	(8.4)	(7.5)	(4.8)	(8.8)
Poverty headcount rate (%)	17.2	16.1	16.1	14.6	14.5	11.5	6.3	6.5	15.2	15.8	33.3
	(0.5)	(0.6)	(0.6)	(0.5)	(0.5)	(0.5)	(27.3)	(27.6)	(8.5)	(7.7)	(4.2)
Poverty gap (%)	4.5	4.8	4.8	3.7	3.7	2.7	7.7	8.4	17.7	17.8	38.8
	(0.2)	(0.3)	(0.3)	(0.2)	(0.2)	(0.1)	(70.8)	(74.2)	(1.2)	(2.0)	(15.4)
USAID poverty gap (%)	26.0	29.8	30.1	25.2	25.3	23.8	14.9	15.9	3.0	2.4	8.3
	(0.5)	(1.0)	(1.1)	(0.7)	(0.7)	(0.7)	(92.7)	(100.6)	(21.9)	(23.6)	(36.9)
Food poverty headcount rate (%)	6.4	7.1	7.1	5.3	5.3	3.8	9.7	10.2	17.8	17.6	41.1
	(0.3)	(0.5)	(0.5)	(0.3)	(0.3)	(0.3)	(48.2)	(49.7)	(6.4)	(7.1)	(19.7)
Vulnerability rate (%)	13.4	11.1	11.2	11.3	11.2	10.4	17.2	17.0	15.6	16.4	22.7
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.9)	(0.7)	(1.0)	(1.3)	(4.9)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	31772.4	32860.4	31781.0	32842.8	32938.7	34666.7	3.4	0.0	3.4	3.7	9.1
	(340.0)	(606.4)	(534.1)	(523.9)	(503.6)	(510.1)	(78.3)	(57.1)	(54.1)	(48.1)	(50.0)
Poverty headcount rate (%)	17.2	15.9	15.7	14.4	14.5	11.3	7.8	8.5	16.3	15.7	34.1
	(0.5)	(0.6)	(0.6)	(0.6)	(0.6)	(0.5)	(24.3)	(24.5)	(12.3)	(12.4)	(1.2)
Poverty gap (%)	4.5	4.7	4.7	3.6	3.6	2.6	4.8	5.5	19.4	19.3	41.1
	(0.2)	(0.3)	(0.3)	(0.2)	(0.2)	(0.1)	(60.6)	(60.6)	(7.3)	(7.2)	(12.5)
USAID poverty gap (%)	26.0	29.5	29.9	25.0	24.9	23.2	13.8	15.3	3.8	4.3	10.7
	(0.5)	(1.0)	(1.0)	(0.7)	(0.7)	(0.7)	(80.2)	(82.1)	(24.9)	(24.1)	(33.0)
Food poverty headcount rate (%)	6.4	6.8	6.8	5.1	5.2	3.6	6.1	6.4	20.4	19.9	44.2
	(0.3)	(0.4)	(0.4)	(0.3)	(0.3)	(0.3)	(37.3)	(37.1)	(1.5)	(2.0)	(17.3)
Vulnerability rate (%)	13.4	11.4	11.5	11.6	11.5	10.7	14.8	14.3	13.9	14.5	20.6
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(2.3)	(3.6)	(1.8)	(1.7)	(1.9)
Adj R-squared	N/A	0.76	0.74	0.68	0.65	0.61					
Obs. (the base survey)	N/A	9071	9071	9071	9071	9071					
Obs. (the target survey)	N/A	9399	9399	9399	9399	9399					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.48. Imputation of welfare indicators in VHLSS 2014 using VHLSS 2020 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	33623.8	35807.2	34678.8	35079.7	35007.0	36061.7	6.5	3.1	4.3	4.1	7.3
	(351.8)	(466.8)	(422.3)	(425.9)	(416.3)	(413.3)	(32.7)	(20.0)	(21.0)	(18.3)	(17.5)
Poverty headcount rate (%)	13.5	11.6	11.7	11.6	11.7	10.0	14.2	13.5	14.3	13.2	26.0
	(0.4)	(0.6)	(0.6)	(0.5)	(0.5)	(0.5)	(22.9)	(24.0)	(14.4)	(15.2)	(6.3)
Poverty gap (%)	3.7	3.3	3.4	2.9	2.9	2.3	12.1	10.2	22.9	21.3	37.2
	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.1)	(45.7)	(48.9)	(0.4)	(1.6)	(11.4)
USAID poverty gap (%)	27.6	28.3	28.7	24.8	25.0	23.4	2.4	3.9	10.1	9.2	15.2
	(0.6)	(1.1)	(1.1)	(0.7)	(0.7)	(0.8)	(79.1)	(84.5)	(17.6)	(18.8)	(25.7)
Food poverty headcount rate (%)	5.5	4.7	4.8	4.1	4.2	3.2	14.4	12.6	25.8	24.1	41.7
	(0.3)	(0.4)	(0.4)	(0.3)	(0.3)	(0.3)	(31.8)	(33.8)	(1.1)	(0.2)	(12.6)
Vulnerability rate (%)	11.0	9.3	9.4	9.8	9.8	9.4	15.4	14.8	10.6	10.7	14.0
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(1.5)	(0.9)	(2.7)	(3.0)	(2.9)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	33623.8	36184.5	35101.9	35492.4	35551.5	36671.3	7.6	4.4	5.6	5.7	9.1
	(351.8)	(671.2)	(596.0)	(568.7)	(555.2)	(584.4)	(90.8)	(69.4)	(61.6)	(57.8)	(66.1)
Poverty headcount rate (%)	13.5	11.3	11.4	11.4	11.6	9.8	16.5	16.0	16.1	13.9	27.5
	(0.4)	(0.6)	(0.6)	(0.5)	(0.5)	(0.5)	(26.3)	(27.2)	(16.9)	(18.4)	(8.5)
Poverty gap (%)	3.7	3.2	3.2	2.8	2.9	2.2	15.1	13.2	24.9	23.3	40.1
	(0.2)	(0.2)	(0.3)	(0.2)	(0.2)	(0.1)	(57.8)	(63.3)	(6.9)	(7.7)	(8.3)
USAID poverty gap (%)	27.6	28.0	28.5	24.7	24.6	22.8	1.6	3.4	10.5	10.9	17.4
	(0.6)	(1.2)	(1.3)	(0.8)	(0.8)	(0.8)	(96.1)	(105.8)	(25.0)	(23.3)	(30.3)
Food poverty headcount rate (%)	5.5	4.5	4.7	3.9	4.1	3.0	17.9	15.7	28.4	26.3	45.7
	(0.3)	(0.4)	(0.4)	(0.3)	(0.3)	(0.3)	(38.8)	(41.2)	(3.6)	(5.5)	(10.4)
Vulnerability rate (%)	11.0	9.4	9.5	9.9	10.0	9.7	14.6	13.7	9.9	9.1	11.9
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.8)	(2.4)	(3.7)	(4.4)	(4.9)
Adj R-squared	N/A	0.76	0.74	0.68	0.65	0.61					
Obs. (the base survey)	N/A	9071	9071	9071	9071	9071					
Obs. (the target survey)	N/A	9399	9399	9399	9399	9399					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.49. Imputation of welfare indicators in VHLSS 2016 using VHLSS 2020 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	38827.2	39176.8	38042.3	38015.8	37934.5	39060.4	0.9	2.0	2.1	2.3	0.6
	(418.4)	(490.8)	(454.8)	(449.9)	(438.2)	(444.0)	(17.3)	(8.7)	(7.5)	(4.7)	(6.1)
Poverty headcount rate (%)	9.8	10.1	10.0	10.6	10.7	8.8	3.1	2.8	8.8	9.1	9.8
	(0.4)	(0.7)	(0.7)	(0.6)	(0.6)	(0.5)	(49.9)	(49.5)	(33.9)	(33.2)	(23.2)
Poverty gap (%)	2.6	3.0	3.0	2.7	2.8	2.2	14.5	16.0	6.0	7.1	16.9
	(0.2)	(0.3)	(0.3)	(0.2)	(0.2)	(0.2)	(109.8)	(114.0)	(32.4)	(31.9)	(17.6)
USAID poverty gap (%)	26.5	29.4	29.9	25.8	26.0	24.4	11.1	12.9	2.5	1.8	7.8
	(0.8)	(1.7)	(1.8)	(1.0)	(1.0)	(1.1)	(110.6)	(121.1)	(24.8)	(25.1)	(30.0)
Food poverty headcount rate (%)	3.8	4.3	4.4	4.0	4.1	3.0	13.4	14.9	5.0	6.3	20.9
	(0.3)	(0.6)	(0.6)	(0.4)	(0.4)	(0.3)	(81.9)	(82.4)	(24.9)	(24.2)	(10.3)
Vulnerability rate (%)	8.5	7.9	7.8	8.4	8.4	8.0	7.3	8.7	1.6	1.7	6.0
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(1.9)	(2.0)	(0.3)	(0.3)	(2.0)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	38827.2	39584.6	38504.3	38477.1	38539.3	39709.6	2.0	0.8	0.9	0.7	2.3
	(418.4)	(663.6)	(601.5)	(574.0)	(560.4)	(568.6)	(58.6)	(43.8)	(37.2)	(33.9)	(35.9)
Poverty headcount rate (%)	9.8	9.8	9.8	10.5	10.6	8.7	0.8	0.4	7.3	8.5	11.0
	(0.4)	(0.6)	(0.6)	(0.5)	(0.5)	(0.5)	(30.4)	(30.1)	(21.7)	(21.9)	(11.0)
Poverty gap (%)	2.6	2.9	2.9	2.7	2.7	2.1	11.0	13.2	4.7	5.5	19.5
	(0.2)	(0.3)	(0.3)	(0.2)	(0.2)	(0.2)	(67.4)	(70.9)	(16.4)	(16.7)	(3.1)
USAID poverty gap (%)	26.5	29.2	29.9	25.9	25.8	24.0	10.2	12.8	2.4	2.7	9.5
	(0.8)	(1.5)	(1.5)	(0.9)	(0.9)	(1.0)	(75.3)	(83.1)	(9.7)	(9.5)	(21.8)
Food poverty headcount rate (%)	3.8	4.2	4.3	3.9	4.0	2.9	9.1	11.6	3.4	4.4	24.1
	(0.3)	(0.4)	(0.4)	(0.3)	(0.3)	(0.3)	(46.3)	(47.0)	(11.2)	(12.0)	(1.9)
Vulnerability rate (%)	8.5	8.0	7.9	8.5	8.5	8.1	6.5	7.8	0.4	0.1	4.8
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.6)	(0.2)	(2.0)	(2.6)	(0.0)
Adj R-squared	N/A	0.76	0.74	0.68	0.65	0.61					
Obs. (the base survey)	N/A	9071	9071	9071	9071	9071					
Obs. (the target survey)	N/A	9399	9399	9399	9399	9399					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.50. Imputation of welfare indicators in VHLSS 2018 using VHLSS 2020 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	43200.0	42533.2	41487.9	41054.0	40832.3	41477.1	1.5	4.0	5.0	5.5	4.0
	(474.4)	(553.7)	(506.6)	(498.2)	(486.1)	(499.7)	(16.7)	(6.8)	(5.0)	(2.5)	(5.3)
Poverty headcount rate (%)	7.0	7.8	7.7	7.9	8.0	7.7	11.3	9.8	12.0	14.4	9.1
	(0.4)	(0.6)	(0.6)	(0.5)	(0.5)	(0.5)	(44.8)	(44.6)	(33.3)	(33.9)	(26.1)
Poverty gap (%)	2.0	2.3	2.3	1.9	2.0	1.8	14.5	14.6	3.1	0.0	6.7
	(0.1)	(0.3)	(0.3)	(0.2)	(0.2)	(0.2)	(91.9)	(93.0)	(23.8)	(24.8)	(17.9)
USAID poverty gap (%)	28.1	29.0	29.4	24.4	24.6	24.1	3.0	4.5	13.4	12.5	14.5
	(1.0)	(2.0)	(2.0)	(1.2)	(1.2)	(1.2)	(100.9)	(107.1)	(19.2)	(18.9)	(23.6)
Food poverty headcount rate (%)	3.2	3.3	3.3	2.7	2.8	2.6	2.5	2.6	15.8	12.6	20.1
	(0.3)	(0.4)	(0.4)	(0.3)	(0.3)	(0.3)	(49.7)	(49.8)	(8.5)	(9.0)	(1.2)
Vulnerability rate (%)	6.6	6.5	6.3	7.1	7.1	7.2	1.2	3.8	7.7	8.9	9.9
	(0.4)	(0.3)	(0.3)	(0.4)	(0.4)	(0.4)	(5.9)	(6.6)	(1.5)	(0.3)	(0.7)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	43200.0	42952.9	41970.9	41528.9	41459.7	42159.9	0.6	2.8	3.9	4.0	2.4
	(474.4)	(794.3)	(722.9)	(668.1)	(648.9)	(681.3)	(67.4)	(52.4)	(40.8)	(36.8)	(43.6)
Poverty headcount rate (%)	7.0	7.6	7.5	7.7	8.0	7.5	8.5	7.2	10.0	13.4	7.3
	(0.4)	(0.6)	(0.6)	(0.6)	(0.6)	(0.5)	(58.1)	(57.4)	(43.8)	(44.4)	(35.0)
Poverty gap (%)	2.0	2.2	2.2	1.9	1.9	1.8	11.2	12.0	4.3	2.1	9.5
	(0.1)	(0.3)	(0.3)	(0.2)	(0.2)	(0.2)	(132.3)	(133.3)	(42.6)	(43.2)	(32.9)
USAID poverty gap (%)	28.1	28.8	29.4	24.5	24.3	23.7	2.5	4.6	13.0	13.6	15.7
	(1.0)	(2.5)	(2.5)	(1.3)	(1.3)	(1.4)	(155.4)	(157.5)	(35.7)	(36.4)	(39.3)
Food poverty headcount rate (%)	3.2	3.2	3.2	2.7	2.7	2.5	0.6	0.4	17.5	14.9	23.7
	(0.3)	(0.5)	(0.5)	(0.4)	(0.4)	(0.3)	(72.2)	(72.1)	(24.3)	(25.3)	(10.2)
Vulnerability rate (%)	6.6	6.4	6.2	7.0	7.1	7.3	2.6	5.7	6.5	8.6	10.9
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(3.3)	(3.5)	(0.6)	(0.7)	(1.8)
Adj R-squared	N/A	0.76	0.74	0.68	0.65	0.61					
Obs. (the base survey)	N/A	9071	9071	9071	9071	9071					
Obs. (the target survey)	N/A	9396	9396	9396	9396	9396					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.51. Imputation of welfare indicators in VHLSS 2022 using VHLSS 2020 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	45657.9	48302.8	47305.5	48634.0	47004.8	46635.1	5.8	3.6	6.5	2.9	2.1
	(693.8)	(624.7)	(583.1)	(596.1)	(492.1)	(477.3)	(10.0)	(16.0)	(14.1)	(29.1)	(31.2)
Poverty headcount rate (%)	6.2	5.2	5.4	4.4	4.5	5.0	15.9	12.9	28.8	27.3	19.9
	(0.3)	(0.4)	(0.4)	(0.3)	(0.3)	(0.4)	(21.2)	(27.8)	(4.5)	(4.9)	(7.4)
Poverty gap (%)	1.6	1.4	1.4	1.0	1.0	1.2	15.6	11.1	37.1	35.6	27.4
	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(18.0)	(26.1)	(10.6)	(10.6)	(5.0)
USAID poverty gap (%)	26.0	26.1	26.6	23.0	23.1	23.6	0.4	2.2	11.6	11.4	9.2
	(1.1)	(1.3)	(1.3)	(1.3)	(1.2)	(1.2)	(18.2)	(20.2)	(15.9)	(15.9)	(14.6)
Food poverty headcount rate (%)	2.4	2.0	2.1	1.4	1.4	1.6	15.6	10.7	41.3	39.9	31.5
	(0.2)	(0.2)	(0.3)	(0.2)	(0.2)	(0.2)	(18.3)	(26.1)	(9.8)	(9.7)	(4.0)
Vulnerability rate (%)	5.3	4.7	4.7	4.7	4.8	4.9	12.2	10.8	11.8	10.5	7.1
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(8.4)	(9.9)	(8.5)	(11.0)	(11.7)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	45657.9	48828.1	47902.2	49233.3	47766.0	47437.4	6.9	4.9	7.8	4.6	3.9
	(693.8)	(822.7)	(758.2)	(738.6)	(649.8)	(651.0)	(18.6)	(9.3)	(6.5)	(6.3)	(6.2)
Poverty headcount rate (%)	6.2	5.1	5.3	4.4	4.5	4.9	17.8	14.6	29.3	28.2	21.6
	(0.3)	(0.4)	(0.4)	(0.3)	(0.3)	(0.3)	(12.8)	(17.5)	(2.1)	(1.3)	(1.2)
Poverty gap (%)	1.6	1.3	1.4	1.0	1.0	1.1	17.8	12.4	36.3	36.5	29.5
	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(7.8)	(14.2)	(17.7)	(19.0)	(14.5)
USAID poverty gap (%)	26.0	26.0	26.7	23.4	23.0	23.4	0.0	2.5	9.9	11.6	10.1
	(1.1)	(1.2)	(1.3)	(1.2)	(1.2)	(1.2)	(15.0)	(16.8)	(12.4)	(9.8)	(7.3)
Food poverty headcount rate (%)	2.4	1.9	2.1	1.4	1.4	1.6	17.8	12.3	40.6	40.9	33.7
	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(8.8)	(15.1)	(16.7)	(17.2)	(12.5)
Vulnerability rate (%)	5.3	4.6	4.6	4.6	4.7	5.0	13.9	13.1	13.9	11.2	6.3
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(5.9)	(8.2)	(7.8)	(11.5)	(12.0)
Adj R-squared	N/A	0.76	0.74	0.68	0.65	0.61					
Obs. (the base survey)	N/A	9071	9071	9071	9071	9071					
Obs. (the target survey)	N/A	9398	9398	9398	9398	9398					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.52. Imputation of welfare indicators in VHLSS 2010 using VHLSS 2022 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	30886.1	28421.2	27914.3	28101.2	28228.7	30623.1	8.0	9.6	9.0	8.6	0.9
	(404.5)	(415.5)	(374.0)	(356.1)	(347.6)	(354.7)	(2.7)	(7.5)	(12.0)	(14.1)	(12.3)
Poverty headcount rate (%)	20.7	24.1	23.1	22.7	22.3	17.1	16.3	11.5	9.2	7.4	17.6
	(0.5)	(0.7)	(0.7)	(0.6)	(0.6)	(0.6)	(26.5)	(24.6)	(17.7)	(16.5)	(5.4)
Poverty gap (%)	5.9	7.5	7.0	6.2	6.1	4.5	27.0	18.3	6.0	4.2	24.2
	(0.2)	(0.3)	(0.3)	(0.2)	(0.2)	(0.2)	(40.6)	(33.6)	(9.4)	(7.5)	(4.5)
USAID poverty gap (%)	28.4	31.0	30.1	27.6	27.6	26.1	9.1	6.1	2.9	2.9	8.0
	(0.5)	(0.7)	(0.7)	(0.6)	(0.6)	(0.6)	(25.7)	(24.6)	(4.1)	(5.7)	(19.4)
Food poverty headcount rate (%)	8.9	11.3	10.4	9.3	9.1	6.5	26.0	16.6	4.0	2.3	27.6
	(0.4)	(0.5)	(0.5)	(0.4)	(0.4)	(0.4)	(28.7)	(23.6)	(6.3)	(4.2)	(8.5)
Vulnerability rate (%)	14.9	13.4	13.7	14.2	14.1	12.8	9.5	7.5	4.7	5.4	14.1
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(1.2)	(2.6)	(2.7)	(2.4)	(1.6)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	30886.1	28750.2	28262.7	28589.7	28760.9	31208.3	6.9	8.5	7.4	6.9	1.0
	(404.5)	(452.7)	(419.3)	(451.3)	(439.1)	(446.6)	(11.9)	(3.7)	(11.6)	(8.6)	(10.4)
Poverty headcount rate (%)	20.7	23.9	22.9	22.4	22.2	16.8	15.4	10.5	8.1	7.0	19.1
	(0.5)	(0.7)	(0.7)	(0.7)	(0.7)	(0.6)	(37.3)	(34.9)	(26.9)	(26.2)	(15.5)
Poverty gap (%)	5.9	7.3	6.8	6.1	6.0	4.3	24.2	15.5	3.1	2.1	26.8
	(0.2)	(0.3)	(0.3)	(0.3)	(0.3)	(0.2)	(73.3)	(64.8)	(29.7)	(28.0)	(13.7)
USAID poverty gap (%)	28.4	30.5	29.6	27.0	27.1	25.7	7.6	4.5	4.7	4.6	9.5
	(0.5)	(0.8)	(0.8)	(0.6)	(0.6)	(0.7)	(46.7)	(45.5)	(16.7)	(18.2)	(37.3)
Food poverty headcount rate (%)	8.9	10.9	10.1	9.0	8.9	6.2	22.1	12.6	0.1	0.6	31.1
	(0.4)	(0.6)	(0.6)	(0.5)	(0.5)	(0.4)	(52.7)	(48.3)	(23.7)	(22.4)	(7.2)
Vulnerability rate (%)	14.9	13.8	14.1	14.5	14.4	13.2	7.2	5.0	2.3	3.2	11.1
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(2.3)	(4.2)	(4.5)	(4.1)	(0.8)
Adj R-squared	N/A	0.70	0.69	0.65	0.63	0.60					
Obs. (the base survey)	N/A	9146	9146	9146	9146	9146					
Obs. (the target survey)	N/A	9399	9399	9399	9399	9399					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.53. Imputation of welfare indicators in VHLSS 2012 using VHLSS 2022 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	31772.4	30186.0	29619.0	29783.5	29878.9	31911.2	5.0	6.8	6.3	6.0	0.4
	(340.0)	(417.0)	(375.5)	(373.2)	(362.4)	(363.1)	(22.6)	(10.4)	(9.8)	(6.6)	(6.8)
Poverty headcount rate (%)	17.2	20.1	19.5	19.7	19.4	15.4	17.0	13.5	14.5	12.7	10.7
	(0.5)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(28.7)	(28.5)	(22.7)	(21.0)	(13.2)
Poverty gap (%)	4.5	6.1	5.8	5.3	5.2	3.9	37.4	29.7	18.7	16.9	11.7
	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(49.1)	(44.2)	(19.7)	(17.7)	(9.1)
USAID poverty gap (%)	26.0	30.5	29.7	26.9	26.9	25.7	17.5	14.3	3.6	3.7	1.2
	(0.5)	(0.7)	(0.7)	(0.6)	(0.6)	(0.6)	(31.3)	(27.9)	(4.0)	(5.8)	(17.6)
Food poverty headcount rate (%)	6.4	9.1	8.6	7.9	7.8	5.7	42.1	33.7	22.4	20.5	11.3
	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.3)	(35.4)	(32.4)	(15.7)	(13.7)	(5.0)
Vulnerability rate (%)	13.4	12.4	12.6	13.1	13.0	11.9	7.5	5.9	2.6	3.5	11.2
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(5.8)	(7.3)	(7.2)	(7.1)	(2.5)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	31772.4	30541.5	29993.9	30297.1	30436.2	32507.7	3.9	5.6	4.6	4.2	2.3
	(340.0)	(523.2)	(477.6)	(538.1)	(514.4)	(494.4)	(53.9)	(40.5)	(58.3)	(51.3)	(45.4)
Poverty headcount rate (%)	17.2	19.8	19.3	19.5	19.3	15.1	15.4	12.1	13.2	12.2	12.0
	(0.5)	(0.7)	(0.7)	(0.6)	(0.6)	(0.6)	(35.7)	(34.2)	(27.1)	(25.8)	(12.5)
Poverty gap (%)	4.5	6.0	5.6	5.1	5.1	3.8	33.8	26.0	15.1	14.2	15.0
	(0.2)	(0.3)	(0.3)	(0.2)	(0.2)	(0.2)	(79.6)	(70.2)	(31.7)	(29.9)	(10.7)
USAID poverty gap (%)	26.0	30.1	29.2	26.4	26.4	25.1	15.9	12.4	1.6	1.8	3.5
	(0.5)	(0.8)	(0.8)	(0.6)	(0.6)	(0.7)	(54.0)	(51.1)	(13.2)	(13.9)	(27.4)
Food poverty headcount rate (%)	6.4	8.9	8.3	7.5	7.5	5.4	37.6	28.7	17.2	16.5	16.4
	(0.3)	(0.5)	(0.5)	(0.4)	(0.4)	(0.3)	(57.0)	(51.5)	(25.5)	(23.9)	(4.8)
Vulnerability rate (%)	13.4	12.8	13.0	13.5	13.3	12.2	4.4	2.9	0.5	0.7	8.8
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(8.3)	(9.9)	(9.4)	(8.9)	(4.2)
Adj R-squared	N/A	0.70	0.69	0.65	0.63	0.60					
Obs. (the base survey)	N/A	9146	9146	9146	9146	9146					
Obs. (the target survey)	N/A	9399	9399	9399	9399	9399					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.54. Imputation of welfare indicators in VHLSS 2014 using VHLSS 2022 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	33623.8	32934.9	32501.4	32125.9	32193.9	33709.1	2.0	3.3	4.5	4.3	0.3
	(351.8)	(452.7)	(410.8)	(409.7)	(398.6)	(401.8)	(28.7)	(16.8)	(16.5)	(13.3)	(14.2)
Poverty headcount rate (%)	13.5	15.1	14.8	16.0	16.1	13.5	11.7	9.7	18.6	18.7	0.1
	(0.4)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(31.9)	(32.1)	(30.3)	(30.6)	(23.5)
Poverty gap (%)	3.7	4.3	4.2	4.2	4.2	3.4	15.5	12.4	12.6	13.3	8.8
	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(50.0)	(46.1)	(23.0)	(23.2)	(13.1)
USAID poverty gap (%)	27.6	28.5	28.2	26.2	26.3	25.2	3.4	2.4	5.0	4.6	8.8
	(0.6)	(0.9)	(0.9)	(0.7)	(0.7)	(0.7)	(43.8)	(40.3)	(5.9)	(7.3)	(16.8)
Food poverty headcount rate (%)	5.5	6.3	6.1	6.2	6.2	4.9	13.6	10.5	11.6	12.8	11.9
	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.3)	(38.3)	(36.5)	(21.3)	(21.5)	(11.4)
Vulnerability rate (%)	11.0	11.0	11.0	11.7	11.6	10.9	0.1	0.3	6.3	5.5	0.8
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(7.2)	(8.6)	(11.1)	(11.6)	(8.8)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	33623.8	33362.4	32956.2	32755.6	32866.1	34394.3	0.8	2.0	2.6	2.3	2.3
	(351.8)	(503.0)	(460.5)	(495.1)	(481.5)	(474.5)	(43.0)	(30.9)	(40.7)	(36.9)	(34.9)
Poverty headcount rate (%)	13.5	14.6	14.4	15.7	15.8	13.2	8.3	6.6	15.7	16.9	2.7
	(0.4)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(32.9)	(32.6)	(31.1)	(32.8)	(25.5)
Poverty gap (%)	3.7	4.1	4.0	4.0	4.1	3.2	11.1	8.0	8.3	9.7	12.9
	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(51.4)	(46.6)	(24.1)	(25.1)	(13.0)
USAID poverty gap (%)	27.6	28.3	28.0	25.8	25.9	24.7	2.6	1.3	6.4	6.1	10.5
	(0.6)	(0.9)	(0.9)	(0.6)	(0.7)	(0.7)	(44.0)	(39.8)	(5.3)	(7.0)	(16.5)
Food poverty headcount rate (%)	5.5	6.0	5.8	5.9	6.0	4.6	8.5	5.8	6.3	8.0	17.1
	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.3)	(39.4)	(37.5)	(23.1)	(24.6)	(11.2)
Vulnerability rate (%)	11.0	11.2	11.2	11.9	11.8	11.1	2.3	2.4	8.0	7.5	1.3
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(8.2)	(10.5)	(13.2)	(13.6)	(11.4)
Adj R-squared	N/A	0.70	0.69	0.65	0.63	0.60					
Obs. (the base survey)	N/A	9146	9146	9146	9146	9146					
Obs. (the target survey)	N/A	9399	9399	9399	9399	9399					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.55. Imputation of welfare indicators in VHLSS 2016 using VHLSS 2022

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	38827.2	36262.8	35598.0	34835.6	34910.2	36426.4	6.6	8.3	10.3	10.1	6.2
	(418.4)	(443.0)	(417.7)	(406.0)	(404.9)	(401.0)	(5.9)	(0.2)	(3.0)	(3.2)	(4.2)
Poverty headcount rate (%)	9.8	12.9	12.8	14.3	14.3	11.9	32.0	30.7	46.7	45.8	22.1
	(0.4)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(40.5)	(41.7)	(35.2)	(33.9)	(27.7)
Poverty gap (%)	2.6	3.8	3.7	3.9	3.9	3.1	46.9	44.1	50.5	49.8	20.6
	(0.2)	(0.3)	(0.3)	(0.2)	(0.2)	(0.2)	(70.0)	(68.9)	(26.1)	(24.7)	(20.8)
USAID poverty gap (%)	26.5	29.5	29.2	27.2	27.2	26.2	11.3	10.3	2.6	2.7	1.2
	(0.8)	(1.2)	(1.2)	(0.7)	(0.7)	(0.8)	(41.4)	(40.4)	(11.1)	(10.2)	(0.5)
Food poverty headcount rate (%)	3.8	5.6	5.5	5.8	5.8	4.5	45.5	43.6	51.4	50.8	18.6
	(0.3)	(0.5)	(0.5)	(0.4)	(0.4)	(0.3)	(53.4)	(52.4)	(21.6)	(20.0)	(15.0)
Vulnerability rate (%)	8.5	9.4	9.4	10.2	10.1	9.4	10.4	10.0	19.4	18.2	10.6
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(9.6)	(9.3)	(11.6)	(11.3)	(7.6)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	38827.2	36741.7	36097.9	35509.3	35627.7	37161.1	5.4	7.0	8.5	8.2	4.3
	(418.4)	(614.4)	(566.0)	(634.7)	(606.9)	(583.1)	(46.8)	(35.3)	(51.7)	(45.0)	(39.4)
Poverty headcount rate (%)	9.8	12.7	12.5	14.1	14.1	11.7	29.5	27.8	44.5	44.6	20.2
	(0.4)	(0.7)	(0.7)	(0.6)	(0.6)	(0.6)	(51.1)	(51.3)	(48.2)	(47.0)	(35.4)
Poverty gap (%)	2.6	3.7	3.6	3.8	3.8	3.0	42.4	39.7	46.3	46.4	16.6
	(0.2)	(0.3)	(0.3)	(0.2)	(0.2)	(0.2)	(92.3)	(89.2)	(55.1)	(53.3)	(36.0)
USAID poverty gap (%)	26.5	29.1	29.0	26.8	26.9	25.7	10.0	9.3	1.2	1.3	3.0
	(0.8)	(1.2)	(1.2)	(0.9)	(0.9)	(1.0)	(50.2)	(49.2)	(3.9)	(4.1)	(15.7)
Food poverty headcount rate (%)	3.8	5.4	5.3	5.6	5.6	4.3	40.8	38.0	46.5	46.7	13.6
	(0.3)	(0.5)	(0.5)	(0.4)	(0.4)	(0.4)	(69.6)	(69.1)	(46.8)	(45.0)	(27.0)
Vulnerability rate (%)	8.5	9.5	9.5	10.3	10.2	9.6	11.1	11.3	20.3	20.0	11.9
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(6.8)	(7.8)	(11.0)	(10.6)	(8.1)
Adj R-squared	N/A	0.70	0.69	0.65	0.63	0.60					
Obs. (the base survey)	N/A	9146	9146	9146	9146	9146					
Obs. (the target survey)	N/A	9399	9399	9399	9399	9399					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.56. Imputation of welfare indicators in VHLSS 2018 using VHLSS 2022 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	43200.0	38991.4	38532.0	37439.9	37404.3	38592.6	9.7	10.8	13.3	13.4	10.7
	(474.4)	(515.5)	(477.4)	(472.7)	(461.8)	(452.5)	(8.7)	(0.6)	(0.4)	(2.6)	(4.6)
Poverty headcount rate (%)	7.0	10.6	10.2	11.4	11.5	10.5	50.4	44.6	62.6	63.7	48.8
	(0.4)	(0.5)	(0.5)	(0.5)	(0.6)	(0.5)	(41.6)	(40.7)	(41.8)	(41.9)	(38.2)
Poverty gap (%)	2.0	3.1	2.9	3.0	3.0	2.7	55.2	48.0	51.9	53.6	36.7
	(0.1)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(58.9)	(56.5)	(30.2)	(29.7)	(30.7)
USAID poverty gap (%)	28.1	29.0	28.8	26.3	26.4	25.8	3.2	2.4	6.6	6.2	8.2
	(1.0)	(1.2)	(1.2)	(0.8)	(0.8)	(0.9)	(20.2)	(22.6)	(14.9)	(14.2)	(6.0)
Food poverty headcount rate (%)	3.2	4.5	4.3	4.4	4.4	3.9	39.5	33.6	36.2	37.9	21.2
	(0.3)	(0.4)	(0.4)	(0.3)	(0.3)	(0.3)	(31.9)	(30.2)	(15.9)	(15.3)	(14.3)
Vulnerability rate (%)	6.6	8.1	8.0	8.9	8.9	8.6	23.9	21.3	35.1	35.1	30.9
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(3.2)	(2.9)	(7.9)	(8.0)	(5.3)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	43200.0	39468.9	39044.2	38122.5	38136.4	39326.3	8.6	9.6	11.8	11.7	9.0
	(474.4)	(651.9)	(583.7)	(616.4)	(596.1)	(615.7)	(37.4)	(23.0)	(29.9)	(25.6)	(29.8)
Poverty headcount rate (%)	7.0	10.3	9.9	11.2	11.3	10.2	46.0	40.7	58.9	60.6	45.8
	(0.4)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(53.8)	(52.8)	(52.3)	(52.8)	(42.8)
Poverty gap (%)	2.0	3.0	2.8	2.9	3.0	2.6	50.5	43.9	47.4	49.6	32.4
	(0.1)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(74.9)	(70.0)	(39.6)	(39.9)	(32.7)
USAID poverty gap (%)	28.1	29.0	28.8	26.1	26.2	25.6	3.1	2.3	7.2	6.8	9.2
	(1.0)	(1.3)	(1.3)	(0.9)	(0.9)	(1.0)	(31.9)	(32.0)	(8.2)	(8.4)	(0.9)
Food poverty headcount rate (%)	3.2	4.3	4.2	4.2	4.3	3.7	35.1	29.3	32.3	34.7	15.9
	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.3)	(41.2)	(39.0)	(21.1)	(21.8)	(13.5)
Vulnerability rate (%)	6.6	8.0	7.8	8.8	8.9	8.6	22.7	19.1	34.9	36.3	30.5
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(10.7)	(9.5)	(14.0)	(14.3)	(12.1)
Adj R-squared	N/A	0.70	0.69	0.65	0.63	0.60					
Obs. (the base survey)	N/A	9146	9146	9146	9146	9146					
Obs. (the target survey)	N/A	9396	9396	9396	9396	9396					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.57. Imputation of welfare indicators in VHLSS 2020 using VHLSS 2022 as the base survey

Welfare indicators	True value	Estimates in Model 1	Estimates in Model 2	Estimates in Model 3	Estimates in Model 4	Estimates in Model 5	APE in Model 1	APE in Model 2	APE in Model 3	APE in Model 4	APE in Model 5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	48333.3	43428.3	43007.4	41984.9	40839.1	41832.5	10.1	11.0	13.1	15.5	13.4
	(573.3)	(558.6)	(534.8)	(541.8)	(446.2)	(449.5)	(2.6)	(6.7)	(5.5)	(22.2)	(21.6)
Poverty headcount rate (%)	5.0	7.5	7.5	8.5	8.4	7.8	50.0	50.0	69.3	67.1	55.2
	(0.3)	(0.4)	(0.5)	(0.5)	(0.5)	(0.4)	(48.1)	(52.0)	(55.0)	(53.8)	(47.7)
Poverty gap (%)	1.2	2.0	2.0	2.2	2.1	2.0	60.8	59.8	74.7	72.3	59.4
	(0.1)	(0.1)	(0.2)	(0.1)	(0.1)	(0.1)	(66.8)	(69.1)	(67.2)	(64.9)	(59.2)
USAID poverty gap (%)	24.7	26.4	26.3	25.4	25.4	25.3	7.2	6.5	3.2	3.1	2.7
	(0.9)	(1.0)	(1.0)	(0.9)	(0.9)	(1.0)	(10.6)	(10.4)	(0.9)	(0.7)	(6.4)
Food poverty headcount rate (%)	1.7	2.9	2.8	3.1	3.1	2.8	63.7	63.1	78.3	75.6	61.0
	(0.2)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(52.8)	(55.3)	(54.8)	(52.9)	(46.4)
Vulnerability rate (%)	5.3	6.6	6.6	7.3	7.3	6.9	23.7	23.4	36.8	36.4	29.2
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(9.3)	(9.7)	(13.7)	(15.3)	(12.0)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	48333.3	43981.1	43586.9	42735.3	41641.5	42661.7	9.0	9.8	11.6	13.8	11.7
	(573.3)	(634.1)	(628.3)	(730.9)	(599.3)	(583.7)	(10.6)	(9.6)	(27.5)	(4.5)	(1.8)
Poverty headcount rate (%)	5.0	7.3	7.3	8.3	8.2	7.6	46.0	46.1	64.8	63.5	51.0
	(0.3)	(0.4)	(0.4)	(0.5)	(0.5)	(0.4)	(49.6)	(51.2)	(53.2)	(51.9)	(42.9)
Poverty gap (%)	1.2	1.9	1.9	2.1	2.1	1.9	53.8	53.3	68.9	66.8	53.1
	(0.1)	(0.2)	(0.2)	(0.2)	(0.1)	(0.1)	(76.0)	(76.1)	(68.7)	(66.6)	(56.0)
USAID poverty gap (%)	24.7	26.0	25.9	25.3	25.2	25.0	5.3	4.9	2.5	2.0	1.4
	(0.9)	(1.1)	(1.1)	(0.9)	(0.9)	(1.0)	(17.3)	(15.7)	(0.1)	(1.9)	(7.2)
Food poverty headcount rate (%)	1.7	2.7	2.7	3.0	2.9	2.7	55.9	55.7	70.7	68.7	53.9
	(0.2)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(60.8)	(60.9)	(55.6)	(54.2)	(44.3)
Vulnerability rate (%)	5.3	6.5	6.4	7.2	7.2	6.8	21.4	20.5	34.5	34.7	27.5
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(8.1)	(8.3)	(12.0)	(13.3)	(10.1)
Adj R-squared	N/A	0.70	0.69	0.65	0.63	0.60					
Obs. (the base survey)	N/A	9146	9146	9146	9146	9146					
Obs. (the target survey)	N/A	9389	9389	9389	9389	9389					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.58. Imputation of welfare indicators in VHLSS 2010 using VHLSS 2016 as the base survey and different consumption models

Welfare indicators	True value	Estimates in Lasso regression	Estimates in rigorous lasso	Estimates in elastic net	Estimates in forward stepwise	Estimates in backward stepwise	APE in Lasso regression	APE in rigorous lasso	APE in elastic net	APE in forward stepwise	APE in backward stepwise
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	30886.1	31114.8	31030.8	31114.8	31206.9	31156.4	0.7	0.5	0.7	1.0	0.9
	(404.5)	(426.9)	(413.4)	(426.9)	(424.3)	(426.4)	(5.5)	(2.2)	(5.5)	(4.9)	(5.4)
Poverty headcount rate (%)	20.7	20.4	20.3	20.4	20.2	20.4	1.7	2.2	1.7	2.4	1.9
	(0.5)	(0.7)	(0.7)	(0.7)	(0.7)	(0.7)	(25.0)	(25.1)	(25.0)	(24.5)	(25.0)
Poverty gap (%)	5.9	6.0	6.0	6.0	6.0	6.0	2.2	2.4	2.2	1.4	1.9
	(0.2)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(33.8)	(36.3)	(33.8)	(33.0)	(33.5)
USAID poverty gap (%)	28.4	29.5	29.7	29.5	29.5	29.5	4.0	4.7	4.0	4.0	3.8
	(0.5)	(0.7)	(0.7)	(0.7)	(0.7)	(0.7)	(30.9)	(35.9)	(30.9)	(31.2)	(30.6)
Food poverty headcount rate (%)	8.9	9.0	9.0	9.0	9.0	9.0	1.2	0.9	1.2	0.4	0.8
	(0.4)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(22.9)	(24.4)	(22.9)	(22.2)	(22.7)
Vulnerability rate (%)	14.9	13.0	12.9	13.0	12.9	12.9	12.8	13.3	12.8	13.1	12.8
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(1.2)	(1.2)	(1.2)	(0.5)	(1.0)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	30886.1	31288.8	31218.2	31288.8	31384.3	31330.7	1.3	1.1	1.3	1.6	1.4
	(404.5)	(501.9)	(494.7)	(501.9)	(501.4)	(501.2)	(24.1)	(22.3)	(24.1)	(24.0)	(23.9)
Poverty headcount rate (%)	20.7	20.3	20.2	20.3	20.1	20.3	2.2	2.9	2.2	2.9	2.4
	(0.5)	(0.7)	(0.7)	(0.7)	(0.7)	(0.7)	(28.6)	(28.9)	(28.6)	(28.1)	(28.3)
Poverty gap (%)	5.9	5.9	5.9	5.9	5.8	5.9	0.1	0.1	0.1	0.8	0.4
	(0.2)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(42.0)	(46.4)	(42.0)	(41.3)	(41.6)
USAID poverty gap (%)	28.4	29.0	29.2	29.0	29.0	29.0	2.2	2.9	2.2	2.2	2.0
	(0.5)	(0.8)	(0.8)	(0.8)	(0.8)	(0.8)	(41.9)	(47.9)	(41.9)	(41.5)	(41.3)
Food poverty headcount rate (%)	8.9	8.8	8.8	8.8	8.7	8.8	1.5	1.8	1.5	2.2	1.8
	(0.4)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(30.9)	(33.6)	(30.9)	(30.3)	(30.6)
Vulnerability rate (%)	14.9	13.3	13.2	13.3	13.2	13.2	10.6	11.0	10.6	11.1	10.8
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(2.5)	(3.2)	(2.5)	(2.3)	(2.5)
Adj R-squared	N/A	0.78	0.77	0.78	0.78	0.78					
Obs. (the base survey)	N/A	9399	9399	9399	9399	9399					
Obs. (the target survey)	N/A	9399	9399	9399	9399	9399					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.59. Imputation of welfare indicators in VHLSS 2012 using VHLSS 2016 as the base survey and different consumption models

Welfare indicators	True value	Estimates in Lasso regression	Estimates in rigorous lasso	Estimates in elastic net	Estimates in forward stepwise	Estimates in backward stepwise	APE in Lasso regression	APE in rigorous lasso	APE in elastic net	APE in forward stepwise	APE in backward stepwise
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	31772.4	33080.7	32977.8	33080.7	33107.6	33092.1	4.1	3.8	4.1	4.2	4.2
	(340.0)	(448.8)	(438.0)	(448.8)	(442.4)	(446.4)	(32.0)	(28.8)	(32.0)	(30.1)	(31.3)
Poverty headcount rate (%)	17.2	16.1	16.0	16.1	15.9	16.0	6.6	6.8	6.6	7.4	6.9
	(0.5)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(29.6)	(29.7)	(29.6)	(28.8)	(29.2)
Poverty gap (%)	4.5	4.6	4.6	4.6	4.6	4.6	3.3	3.5	3.3	2.4	2.9
	(0.2)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(57.7)	(61.1)	(57.7)	(56.7)	(57.1)
USAID poverty gap (%)	26.0	28.7	28.8	28.7	28.7	28.7	10.7	11.1	10.7	10.6	10.5
	(0.5)	(0.9)	(0.9)	(0.9)	(0.9)	(0.9)	(62.3)	(69.6)	(62.3)	(63.3)	(62.3)
Food poverty headcount rate (%)	6.4	6.8	6.8	6.8	6.8	6.8	6.2	6.2	6.2	5.2	5.7
	(0.3)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(39.0)	(40.3)	(39.0)	(37.9)	(38.5)
Vulnerability rate (%)	13.4	11.4	11.3	11.4	11.3	11.4	15.4	15.5	15.4	15.8	15.4
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(3.1)	(3.6)	(3.1)	(2.6)	(3.0)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	31772.4	33276.8	33186.6	33276.8	33306.0	33287.5	4.7	4.5	4.7	4.8	4.8
	(340.0)	(474.4)	(471.3)	(474.4)	(471.8)	(474.0)	(39.5)	(38.6)	(39.5)	(38.7)	(39.4)
Poverty headcount rate (%)	17.2	15.8	15.8	15.8	15.6	15.7	8.2	8.4	8.2	9.1	8.5
	(0.5)	(0.7)	(0.7)	(0.7)	(0.6)	(0.7)	(32.1)	(33.0)	(32.1)	(31.8)	(32.2)
Poverty gap (%)	4.5	4.5	4.5	4.5	4.4	4.4	0.0	0.2	0.0	0.9	0.4
	(0.2)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(63.6)	(68.5)	(63.6)	(63.4)	(63.6)
USAID poverty gap (%)	26.0	28.3	28.4	28.3	28.3	28.2	9.0	9.3	9.0	9.1	8.8
	(0.5)	(0.9)	(0.9)	(0.9)	(0.9)	(0.9)	(66.8)	(73.4)	(66.8)	(67.2)	(66.1)
Food poverty headcount rate (%)	6.4	6.6	6.6	6.6	6.6	6.6	2.7	2.3	2.7	1.9	2.3
	(0.3)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(45.2)	(47.1)	(45.2)	(44.9)	(45.3)
Vulnerability rate (%)	13.4	11.6	11.6	11.6	11.6	11.6	13.7	13.6	13.7	13.8	13.6
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(6.2)	(7.5)	(6.2)	(6.1)	(6.1)
Adj R-squared	N/A	0.78	0.77	0.78	0.78	0.78					
Obs. (the base survey)	N/A	9399	9399	9399	9399	9399					
Obs. (the target survey)	N/A	9399	9399	9399	9399	9399					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.60. Imputation of welfare indicators in VHLSS 2014 using VHLSS 2016 as the base survey and different consumption models

Welfare indicators	True value	Estimates in Lasso regression	Estimates in rigorous lasso	Estimates in elastic net	Estimates in forward stepwise	Estimates in backward stepwise	APE in Lasso regression	APE in rigorous lasso	APE in elastic net	APE in forward stepwise	APE in backward stepwise
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	33623.8	35151.6	35085.5	35156.8	35134.9	35154.0	4.5	4.3	4.6	4.5	4.6
	(351.8)	(434.8)	(429.5)	(434.7)	(432.1)	(435.6)	(23.6)	(22.1)	(23.6)	(22.8)	(23.8)
Poverty headcount rate (%)	13.5	11.9	11.9	11.9	11.9	11.9	12.0	11.8	12.1	12.3	11.9
	(0.4)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(18.9)	(20.4)	(18.8)	(18.5)	(18.9)
Poverty gap (%)	3.7	3.3	3.3	3.3	3.3	3.3	12.1	11.6	12.2	12.2	12.2
	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(30.7)	(35.2)	(30.6)	(30.3)	(30.3)
USAID poverty gap (%)	27.6	27.6	27.7	27.6	27.6	27.5	0.0	0.3	0.0	0.1	0.2
	(0.6)	(0.9)	(1.0)	(0.9)	(1.0)	(0.9)	(54.2)	(59.3)	(54.2)	(54.3)	(53.4)
Food poverty headcount rate (%)	5.5	4.8	4.8	4.8	4.8	4.8	13.4	13.2	13.6	13.6	13.7
	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(20.8)	(24.1)	(20.7)	(20.4)	(20.7)
Vulnerability rate (%)	11.0	9.9	9.9	9.9	9.9	10.0	9.5	9.7	9.5	9.6	9.3
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(3.3)	(3.5)	(3.3)	(3.2)	(3.4)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	33623.8	35332.0	35282.0	35337.7	35319.0	35334.5	5.1	4.9	5.1	5.0	5.1
	(351.8)	(472.2)	(468.3)	(472.4)	(471.8)	(474.1)	(34.2)	(33.1)	(34.3)	(34.1)	(34.8)
Poverty headcount rate (%)	13.5	11.6	11.6	11.6	11.5	11.6	14.5	14.5	14.6	14.6	14.4
	(0.4)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(25.6)	(27.4)	(25.6)	(25.6)	(25.9)
Poverty gap (%)	3.7	3.1	3.2	3.1	3.1	3.1	15.7	15.3	15.8	15.8	15.8
	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(38.2)	(43.7)	(38.0)	(38.1)	(38.3)
USAID poverty gap (%)	27.6	27.2	27.3	27.2	27.2	27.1	1.4	1.0	1.4	1.4	1.6
	(0.6)	(1.0)	(1.0)	(1.0)	(1.0)	(1.0)	(63.1)	(69.2)	(63.1)	(63.1)	(62.9)
Food poverty headcount rate (%)	5.5	4.5	4.5	4.5	4.5	4.5	18.0	17.7	18.1	18.1	17.9
	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(29.7)	(33.3)	(29.4)	(29.5)	(29.7)
Vulnerability rate (%)	11.0	10.1	10.1	10.1	10.1	10.1	7.7	7.9	7.7	8.0	7.6
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(8.8)	(9.1)	(8.8)	(8.8)	(9.1)
Adj R-squared	N/A	0.78	0.77	0.78	0.78	0.78					
Obs. (the base survey)	N/A	9399	9399	9399	9399	9399					
Obs. (the target survey)	N/A	9399	9399	9399	9399	9399					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.61. Imputation of welfare indicators in VHLSS 2018 using VHLSS 2016 as the base survey and different consumption models

Welfare indicators	True value	Estimates in Lasso regression	Estimates in rigorous lasso	Estimates in elastic net	Estimates in forward stepwise	Estimates in backward stepwise	APE in Lasso regression	APE in rigorous lasso	APE in elastic net	APE in forward stepwise	APE in backward stepwise
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	43200.0	42211.7	42114.2	42215.5	42034.1	42143.8	2.3	2.5	2.3	2.7	2.4
	(474.4)	(629.9)	(623.6)	(629.4)	(624.7)	(629.6)	(32.8)	(31.4)	(32.7)	(31.7)	(32.7)
Poverty headcount rate (%)	7.0	8.3	8.3	8.3	8.4	8.4	18.0	18.5	17.9	19.6	19.4
	(0.4)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(54.0)	(55.5)	(53.9)	(54.9)	(54.8)
Poverty gap (%)	2.0	2.5	2.5	2.5	2.6	2.5	26.6	26.0	26.5	29.1	28.7
	(0.1)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(108.9)	(110.4)	(108.7)	(111.3)	(111.2)
USAID poverty gap (%)	28.1	30.2	29.9	30.2	30.4	30.4	7.3	6.4	7.3	8.0	7.9
	(1.0)	(1.9)	(1.9)	(1.9)	(1.9)	(1.9)	(90.0)	(89.9)	(90.0)	(89.8)	(90.5)
Food poverty headcount rate (%)	3.2	3.6	3.6	3.6	3.7	3.7	13.4	12.9	13.4	15.8	15.4
	(0.3)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(60.8)	(61.9)	(60.7)	(61.9)	(61.7)
Vulnerability rate (%)	6.6	6.7	6.8	6.7	6.7	6.7	2.1	3.3	2.1	2.6	2.5
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(2.4)	(1.6)	(2.4)	(2.2)	(2.2)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	43200.0	42500.4	42417.0	42504.4	42323.7	42430.6	1.6	1.8	1.6	2.0	1.8
	(474.4)	(726.5)	(731.6)	(723.0)	(724.6)	(727.3)	(53.1)	(54.2)	(52.4)	(52.8)	(53.3)
Poverty headcount rate (%)	7.0	8.0	8.1	8.0	8.1	8.1	14.3	14.9	14.3	15.7	15.6
	(0.4)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(38.1)	(39.8)	(37.9)	(38.4)	(38.7)
Poverty gap (%)	2.0	2.4	2.4	2.4	2.5	2.5	22.7	22.1	22.6	25.2	24.8
	(0.1)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(65.9)	(67.5)	(65.7)	(67.3)	(67.5)
USAID poverty gap (%)	28.1	30.2	29.9	30.2	30.5	30.4	7.4	6.3	7.3	8.3	8.0
	(1.0)	(1.6)	(1.6)	(1.6)	(1.6)	(1.6)	(61.8)	(61.0)	(62.1)	(62.3)	(62.1)
Food poverty headcount rate (%)	3.2	3.5	3.5	3.5	3.6	3.6	10.2	9.4	10.1	12.3	12.1
	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(30.9)	(32.7)	(30.8)	(31.3)	(31.8)
Vulnerability rate (%)	6.6	6.6	6.7	6.6	6.7	6.7	1.3	2.1	1.2	2.5	2.0
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.0)	(1.2)	(0.2)	(0.1)	(0.1)
Adj R-squared	N/A	0.78	0.77	0.78	0.78	0.78					
Obs. (the base survey)	N/A	9399	9399	9399	9399	9399					
Obs. (the target survey)	N/A	9396	9396	9396	9396	9396					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.62. Imputation of welfare indicators in VHLSS 2020 using VHLSS 2016 as the base survey and different consumption models

Welfare indicators	True value	Estimates in Lasso regression	Estimates in rigorous lasso	Estimates in elastic net	Estimates in forward stepwise	Estimates in backward stepwise	APE in Lasso regression	APE in rigorous lasso	APE in elastic net	APE in forward stepwise	APE in backward stepwise
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	48333.3	47890.1	47968.2	47890.1	46947.3	47723.8	0.9	0.8	0.9	2.9	1.3
	(573.3)	(628.2)	(638.2)	(628.2)	(568.7)	(617.6)	(9.6)	(11.3)	(9.6)	(0.8)	(7.7)
Poverty headcount rate (%)	5.0	5.6	5.7	5.6	5.6	5.6	11.8	13.2	11.8	11.5	12.6
	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(33.3)	(35.8)	(33.3)	(32.9)	(33.4)
Poverty gap (%)	1.2	1.5	1.6	1.5	1.5	1.6	24.9	25.7	24.9	25.0	25.7
	(0.1)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(69.7)	(72.9)	(69.7)	(69.6)	(69.3)
USAID poverty gap (%)	24.7	27.5	27.4	27.5	27.6	27.5	11.7	11.1	11.7	12.1	11.7
	(0.9)	(1.4)	(1.4)	(1.4)	(1.4)	(1.4)	(54.1)	(55.4)	(54.1)	(54.4)	(52.9)
Food poverty headcount rate (%)	1.7	2.2	2.2	2.2	2.2	2.2	25.8	26.6	25.8	26.1	26.9
	(0.2)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(46.0)	(48.8)	(46.0)	(46.0)	(45.9)
Vulnerability rate (%)	5.3	5.1	5.2	5.1	5.1	5.1	4.2	3.2	4.2	4.9	4.0
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.0)	(0.5)	(0.0)	(0.2)	(0.0)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	48333.3	48217.2	48323.2	48217.2	47270.0	48049.0	0.2	0.0	0.2	2.2	0.6
	(573.3)	(637.4)	(650.7)	(637.4)	(571.9)	(619.5)	(11.2)	(13.5)	(11.2)	(0.2)	(8.1)
Poverty headcount rate (%)	5.0	5.4	5.5	5.4	5.4	5.5	8.3	9.5	8.3	7.9	8.9
	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(27.5)	(30.9)	(27.5)	(26.1)	(27.4)
Poverty gap (%)	1.2	1.5	1.5	1.5	1.5	1.5	20.0	20.5	20.0	20.2	20.7
	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(51.7)	(55.5)	(51.7)	(49.9)	(50.3)
USAID poverty gap (%)	24.7	27.3	27.1	27.3	27.5	27.3	10.9	10.1	10.9	11.4	10.9
	(0.9)	(1.4)	(1.4)	(1.4)	(1.4)	(1.4)	(50.7)	(51.6)	(50.7)	(50.9)	(49.1)
Food poverty headcount rate (%)	1.7	2.1	2.1	2.1	2.1	2.1	20.7	21.3	20.7	21.1	21.3
	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(31.3)	(35.8)	(31.3)	(29.7)	(30.1)
Vulnerability rate (%)	5.3	5.0	5.1	5.0	5.0	5.0	5.7	5.1	5.7	6.5	5.4
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(2.1)	(2.8)	(2.1)	(2.3)	(2.7)
Adj R-squared	N/A	0.78	0.77	0.78	0.78	0.78					
Obs. (the base survey)	N/A	9399	9399	9399	9399	9399					
Obs. (the target survey)	N/A	9389	9389	9389	9389	9389					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.63. Imputation of welfare indicators in VHLSS 2022 using VHLSS 2016 as the base survey and different consumption models

Welfare indicators	True value	Estimates in Lasso regression	Estimates in rigorous lasso	Estimates in elastic net	Estimates in forward stepwise	Estimates in backward stepwise	APE in Lasso regression	APE in rigorous lasso	APE in elastic net	APE in forward stepwise	APE in backward stepwise
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A. Normal linear regression method											
Per capita consumption (thousand VND)	45657.9	49260.4	49334.3	49260.4	48166.9	49056.9	7.9	8.1	7.9	5.5	7.4
	(693.8)	(644.5)	(666.8)	(644.5)	(584.7)	(639.3)	(7.1)	(3.9)	(7.1)	(15.7)	(7.9)
Poverty headcount rate (%)	6.2	5.5	5.5	5.5	5.5	5.5	11.4	12.0	11.4	10.9	11.0
	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(24.6)	(24.6)	(24.6)	(24.7)	(24.5)
Poverty gap (%)	1.6	1.4	1.4	1.4	1.5	1.5	10.2	11.1	10.2	9.1	9.7
	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(24.5)	(23.9)	(24.5)	(24.6)	(24.4)
USAID poverty gap (%)	26.0	26.4	26.3	26.4	26.6	26.4	1.5	1.0	1.5	2.1	1.5
	(1.1)	(1.3)	(1.3)	(1.3)	(1.3)	(1.3)	(17.2)	(17.4)	(17.2)	(16.8)	(16.9)
Food poverty headcount rate (%)	2.4	2.1	2.1	2.1	2.1	2.1	10.6	11.9	10.6	9.2	10.1
	(0.2)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(25.7)	(24.8)	(25.7)	(25.9)	(25.6)
Vulnerability rate (%)	5.3	4.8	4.8	4.8	4.8	4.8	10.6	9.8	10.6	10.3	10.3
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(10.0)	(10.6)	(10.0)	(10.3)	(10.2)
Panel B. Empirical distribution method											
Per capita consumption (thousand VND)	45657.9	49602.5	49697.9	49602.5	48503.8	49395.4	8.6	8.8	8.6	6.2	8.2
	(693.8)	(632.9)	(652.2)	(632.9)	(597.2)	(624.4)	(8.8)	(6.0)	(8.8)	(13.9)	(10.0)
Poverty headcount rate (%)	6.2	5.3	5.3	5.3	5.4	5.3	14.3	15.1	14.3	13.7	13.9
	(0.3)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(40.7)	(40.7)	(40.7)	(40.3)	(40.8)
Poverty gap (%)	1.6	1.4	1.4	1.4	1.4	1.4	13.5	14.7	13.5	12.5	13.1
	(0.1)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(40.7)	(39.8)	(40.7)	(40.3)	(41.5)
USAID poverty gap (%)	26.0	26.3	26.1	26.3	26.4	26.3	0.9	0.4	0.9	1.5	0.9
	(1.1)	(1.3)	(1.3)	(1.3)	(1.3)	(1.3)	(20.7)	(20.3)	(20.7)	(19.5)	(20.4)
Food poverty headcount rate (%)	2.4	2.0	2.0	2.0	2.1	2.1	13.0	14.7	13.0	11.6	12.5
	(0.2)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(45.5)	(44.3)	(45.5)	(45.3)	(46.7)
Vulnerability rate (%)	5.3	4.6	4.7	4.6	4.7	4.7	12.9	12.5	12.9	12.6	12.6
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(11.7)	(13.0)	(11.7)	(11.9)	(11.6)
Adj R-squared	N/A	0.78	0.77	0.78	0.78	0.78					
Obs. (the base survey)	N/A	9399	9399	9399	9399	9399					
Obs. (the target survey)	N/A	9398	9398	9398	9398	9398					

Note: Point estimates and standard errors are adjusted for complex survey designs. In columns 2 to 6, standard errors of the imputed estimates are reported in parentheses. In columns 7 to 11, the figures in parentheses report the absolute relative ratios of the standard errors of the imputed estimates to those of the observed estimates (shown in column 1).

Table A.64. Imputation results for the 1993-2008 period using VHLSS 2012 as the base survey

Welfare indicators	VLSS 1993	VLSS 1998	VHLSS 2002	VHLSS 2004	VHLSS 2006	VHLSS 2008
Panel A. Normal linear regression method						
Per capita consumption (thousand VND)	11085.8	14915.8	18532.9	21568.4	23800.5	26664.6
	(231.3)	(322.6)	(236.4)	(265.9)	(282.3)	(351.4)
Poverty headcount rate (percent)	78.4	61.9	47.4	37.4	31.5	24.9
	(1.1)	(1.3)	(0.7)	(0.8)	(0.8)	(0.7)
Poverty gap (percent)	34.2	23.0	15.5	11.3	9.0	6.7
	(0.9)	(0.8)	(0.3)	(0.3)	(0.3)	(0.3)
USAID poverty gap (percent)	43.7	37.1	32.7	30.1	28.7	26.8
	(0.7)	(0.7)	(0.4)	(0.5)	(0.6)	(0.6)
Food poverty headcount rate (percent)	57.1	37.7	24.6	17.3	13.6	9.8
	(1.4)	(1.4)	(0.6)	(0.6)	(0.6)	(0.5)
Vulnerability rate (percent)	10.2	14.9	17.4	17.9	17.3	16.2
	(0.5)	(0.6)	(0.4)	(0.5)	(0.5)	(0.5)
Panel B. Empirical distribution method						
Per capita consumption (thousand VND)	11129.0	14974.4	18645.1	21662.2	23911.6	26781.2
	(188.0)	(331.0)	(226.3)	(293.8)	(296.9)	(336.3)
Poverty headcount rate (percent)	78.6	62.5	48.0	37.8	31.9	25.0
	(0.9)	(1.3)	(0.7)	(0.8)	(0.8)	(0.7)
Poverty gap (percent)	34.5	23.2	15.5	11.2	9.0	6.6
	(0.8)	(0.9)	(0.4)	(0.4)	(0.3)	(0.3)
USAID poverty gap (percent)	43.9	37.1	32.4	29.6	28.2	26.5
	(0.6)	(0.8)	(0.4)	(0.6)	(0.6)	(0.6)
Food poverty headcount rate (percent)	57.7	38.2	24.6	17.1	13.4	9.7
	(1.3)	(1.6)	(0.6)	(0.7)	(0.6)	(0.5)
Vulnerability rate (percent)	9.9	14.6	17.4	18.1	17.6	16.6
	(0.5)	(0.6)	(0.4)	(0.5)	(0.5)	(0.5)
Adj R-squared	0.74	0.74	0.74	0.74	0.74	0.74
Obs. (the base survey)	9399	9399	9399	9399	9399	9399
Obs. (the target survey)	4799	5999	29530	9176	9178	9183

Note: This table reports the imputed estimates computed from the imputed per capita consumption using the 2012 survey as the base. Model 2 (see Table A.7 in the Appendix) is used to model per capita consumption in the 2012 VHLSS.
Standard errors are in paratheses. Point estimates and standard errors are adjusted for complex survey designs.

Table A.65. Imputation results for the 1993-2008 period using VHLSS 2020 as the base survey

Welfare indicators	VLSS 1993	VLSS 1998	VHLSS 2002	VHLSS 2004	VHLSS 2006	VHLSS 2008
Panel A. Normal linear regression method						
Per capita consumption (thousand VND)	9558.1	14044.3	17805.4	21115.3	23377.9	26312.5
	(254.2)	(345.3)	(239.2)	(278.7)	(291.2)	(356.6)
Poverty headcount rate (percent)	77.8	58.9	44.3	34.0	28.5	22.3
	(1.1)	(1.4)	(0.7)	(0.7)	(0.7)	(0.7)
Poverty gap (percent)	40.2	25.0	16.3	11.3	8.9	6.5
	(1.1)	(1.0)	(0.4)	(0.4)	(0.4)	(0.3)
USAID poverty gap (percent)	51.7	42.5	36.9	33.3	31.3	29.3
	(0.8)	(1.0)	(0.5)	(0.7)	(0.8)	(0.9)
Food poverty headcount rate (percent)	62.3	39.0	25.1	17.1	13.3	9.6
	(1.5)	(1.6)	(0.6)	(0.6)	(0.6)	(0.5)
Vulnerability rate (percent)	9.0	14.0	16.2	16.3	15.6	14.4
	(0.5)	(0.6)	(0.4)	(0.5)	(0.5)	(0.5)
Panel B. Empirical distribution method						
Per capita consumption (thousand VND)	9647.1	14168.0	18007.6	21367.8	23705.2	26684.5
	(263.8)	(422.1)	(291.3)	(383.4)	(461.0)	(553.3)
Poverty headcount rate (percent)	77.9	59.5	44.7	34.1	28.5	22.0
	(1.2)	(1.6)	(0.7)	(0.7)	(0.7)	(0.7)
Poverty gap (percent)	40.3	25.1	16.3	11.1	8.8	6.3
	(1.1)	(1.2)	(0.4)	(0.3)	(0.3)	(0.3)
USAID poverty gap (percent)	51.7	42.2	36.4	32.7	30.8	28.9
	(0.8)	(1.1)	(0.6)	(0.6)	(0.6)	(0.7)
Food poverty headcount rate (percent)	62.2	38.9	24.8	16.6	12.9	9.2
	(1.6)	(1.9)	(0.7)	(0.6)	(0.5)	(0.5)
Vulnerability rate (percent)	9.0	14.0	16.5	16.9	16.1	14.9
	(0.5)	(0.7)	(0.4)	(0.5)	(0.5)	(0.5)
Adj R-squared	0.74	0.74	0.74	0.74	0.74	0.74
Obs. (the base survey)	9069	9069	9069	9069	9069	9069
Obs. (the target survey)	4799	5999	29530	9176	9178	9183

Note: This table reports the imputed estimates computed from the imputed per capita consumption using the 2020 survey as the base. Model 2 (see Table A.7 in the Appendix) is used to model per capita consumption in the 2020 VHLSS.
Standard errors are in paratheses. Point estimates and standard errors are adjusted for complex survey designs.

Table A.66. Imputation results for the 2010-2022 period using VHLSS 2002 as the base survey

Welfare indicators	VHLSS 2010	VHLSS 2012	VHLSS 2014	VHLSS 2016	VHLSS 2018	VHLSS 2020	VHLSS 2022
Panel A. Normal linear regression method							
Per capita consumption (thousand VND)	20549.6	21772.5	23601.9	26068.8	28507.7	34469.6	34687.5
	(332.7)	(310.9)	(323.4)	(348.3)	(427.6)	(812.9)	(760.3)
Poverty headcount rate (percent)	9.5	7.9	5.3	4.7	3.4	2.3	2.2
	(0.5)	(0.5)	(0.4)	(0.4)	(0.4)	(0.2)	(0.2)
Poverty gap (percent)	2.3	1.9	1.2	1.1	0.8	0.5	0.5
	(0.1)	(0.2)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
USAID poverty gap (percent)	23.8	23.8	22.2	23.2	22.7	20.9	22.0
	(0.7)	(1.2)	(1.0)	(1.2)	(1.6)	(1.3)	(1.5)
Food poverty headcount rate (percent)	3.2	2.6	1.5	1.5	1.0	0.6	0.6
	(0.3)	(0.3)	(0.2)	(0.2)	(0.2)	(0.1)	(0.1)
Vulnerability rate (percent)	9.0	7.8	5.9	4.9	3.7	2.9	2.6
	(0.4)	(0.3)	(0.3)	(0.3)	(0.3)	(0.2)	(0.2)
Panel B. Empirical distribution method							
Per capita consumption (thousand VND)	20689.8	21916.4	23790.9	26265.9	28717.6	34690.4	34916.6
	(290.1)	(299.0)	(316.9)	(335.5)	(412.2)	(1011.1)	(618.7)
Poverty headcount rate (percent)	9.4	7.8	5.1	4.6	3.3	2.3	2.2
	(0.5)	(0.4)	(0.4)	(0.4)	(0.4)	(0.2)	(0.2)
Poverty gap (percent)	2.2	1.8	1.1	1.1	0.7	0.5	0.5
	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
USAID poverty gap (percent)	23.5	23.6	21.9	23.1	22.5	20.5	21.5
	(0.8)	(0.9)	(1.0)	(1.2)	(1.6)	(1.3)	(1.5)
Food poverty headcount rate (percent)	3.0	2.5	1.5	1.5	1.0	0.6	0.6
	(0.3)	(0.2)	(0.2)	(0.2)	(0.2)	(0.1)	(0.1)
Vulnerability rate (percent)	9.1	7.8	5.9	4.8	3.7	2.9	2.6
	(0.4)	(0.4)	(0.3)	(0.3)	(0.3)	(0.2)	(0.2)
Adj R-squared	0.718	0.718	0.718	0.718	0.718	0.718	0.718
Obs. (the base survey)	29530	29530	29530	29530	29530	29530	29530
Obs. (the target survey)	9399	9399	9399	9399	9396	9389	9398

Note: This table reports the imputed estimates computed from the imputed per capita consumption using the 2002 survey as the base. Model 2 (see Table A.7 in the Appendix) is used to model per capita consumption in the 2002 VHLSS.
Standard errors are in paratheses. Point estimates and standard errors are adjusted for complex survey designs.

Table A.67. Imputation results for the 2010-2022 period using VHLSS 2006 as the base survey

Welfare indicators	VHLSS 2010	VHLSS 2012	VHLSS 2014	VHLSS 2016	VHLSS 2018	VHLSS 2020	VHLSS 2022
Panel A. Normal linear regression method							
Per capita consumption (thousand VND)	20592.7	21814.1	23720.6	26142.7	28507.7	32421.6	33000.1
	(279.1)	(285.0)	(314.1)	(305.3)	(357.8)	(468.9)	(459.3)
Poverty headcount rate (percent)	9.8	8.1	5.6	5.0	3.7	2.5	2.3
	(0.5)	(0.4)	(0.4)	(0.3)	(0.3)	(0.2)	(0.2)
Poverty gap (percent)	2.4	1.9	1.3	1.2	0.9	0.5	0.5
	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
USAID poverty gap (percent)	24.2	24.0	22.7	23.7	23.3	21.1	21.8
	(0.8)	(0.8)	(1.0)	(1.0)	(1.6)	(1.3)	(1.4)
Food poverty headcount rate (percent)	3.3	2.7	1.7	1.6	1.2	0.7	0.7
	(0.3)	(0.2)	(0.2)	(0.2)	(0.2)	(0.1)	(0.1)
Vulnerability rate (percent)	9.2	7.9	6.1	5.0	3.9	3.0	2.7
	(0.4)	(0.3)	(0.3)	(0.3)	(0.3)	(0.2)	(0.2)
Panel B. Empirical distribution method							
Per capita consumption (thousand VND)	20657.7	21882.7	23828.8	26250.3	28604.3	32537.9	33126.4
	(289.1)	(319.9)	(300.5)	(349.4)	(354.8)	(591.9)	(477.4)
Poverty headcount rate (percent)	9.6	7.9	5.4	4.8	3.6	2.3	2.3
	(0.4)	(0.4)	(0.4)	(0.4)	(0.3)	(0.2)	(0.2)
Poverty gap (percent)	2.3	1.9	1.2	1.1	0.8	0.5	0.5
	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
USAID poverty gap (percent)	23.8	23.7	22.4	23.5	23.1	20.6	21.3
	(0.8)	(1.1)	(1.1)	(1.2)	(1.3)	(1.3)	(1.4)
Food poverty headcount rate (percent)	3.2	2.6	1.6	1.6	1.1	0.6	0.6
	(0.2)	(0.3)	(0.2)	(0.2)	(0.2)	(0.1)	(0.1)
Vulnerability rate (percent)	9.3	7.9	6.1	4.9	3.9	3.0	2.6
	(0.4)	(0.3)	(0.3)	(0.3)	(0.3)	(0.2)	(0.2)
Adj R-squared	0.726	0.726	0.726	0.726	0.726	0.726	0.726
Obs. (the base survey)	9178	9178	9178	9178	9178	9178	9178
Obs. (the target survey)	9399	9399	9399	9399	9396	9389	9398

Note: This table reports the imputed estimates computed from the imputed per capita consumption using the 2006 survey as the base. Model 2 (see Table A.7 in the Appendix) is used to model per capita consumption in the 2006 VHLSS.
Standard errors are in paratheses. Point estimates and standard errors are adjusted for complex survey designs.

Table A.68. Imputation results for the 1993-2008 period using VHLSS 2012 as the base survey and lasso regression

Welfare indicators	VLSS 1993	VLSS 1998	VHLSS 2002	VHLSS 2004	VHLSS 2006	VHLSS 2008
Panel A. Normal linear regression method						
Per capita consumption (thousand VND)	9173.2	13157.6	16547.2	20337.3	22478.3	26762.1
	(207.9)	(298.3)	(265.3)	(282.9)	(293.1)	(384.8)
Poverty headcount rate (percent)	86.4	71.2	58.9	44.7	37.9	28.2
	(0.9)	(1.2)	(0.7)	(0.8)	(0.8)	(0.8)
Poverty gap (percent)	43.3	28.9	21.3	14.5	11.7	8.0
	(0.9)	(0.8)	(0.4)	(0.4)	(0.4)	(0.3)
USAID poverty gap (percent)	50.1	40.6	36.1	32.3	30.8	28.5
	(0.6)	(0.6)	(0.4)	(0.5)	(0.6)	(0.6)
Food poverty headcount rate (percent)	70.5	47.9	35.0	22.9	18.1	12.1
	(1.2)	(1.4)	(0.6)	(0.7)	(0.7)	(0.6)
Vulnerability rate (percent)	6.5	11.9	14.6	16.5	16.7	15.8
	(0.4)	(0.5)	(0.3)	(0.5)	(0.5)	(0.5)
Panel B. Empirical distribution method						
Per capita consumption (thousand VND)	9211.9	13219.8	16642.1	20427.1	22597.6	26912.0
	(166.1)	(307.5)	(237.7)	(304.3)	(300.7)	(380.2)
Poverty headcount rate (percent)	86.5	71.8	59.6	45.4	38.4	28.5
	(0.7)	(1.2)	(0.7)	(0.8)	(0.8)	(0.7)
Poverty gap (percent)	43.5	29.2	21.4	14.5	11.6	8.0
	(0.7)	(0.8)	(0.4)	(0.4)	(0.4)	(0.3)
USAID poverty gap (percent)	50.3	40.7	35.9	31.9	30.3	28.0
	(0.6)	(0.7)	(0.4)	(0.6)	(0.6)	(0.6)
Food poverty headcount rate (percent)	71.0	48.8	35.4	22.9	18.0	11.8
	(1.1)	(1.5)	(0.7)	(0.7)	(0.7)	(0.5)
Vulnerability rate (percent)	6.3	11.4	14.2	16.5	16.8	16.1
	(0.4)	(0.5)	(0.3)	(0.5)	(0.5)	(0.5)
Adj R-squared	0.76	0.76	0.76	0.76	0.76	0.76
Obs. (the base survey)	9069	9069	9069	9069	9069	9069
Obs. (the target survey)	4799	5999	29530	9176	9178	9183

Note: This table reports the imputed estimates computed from the imputed per capita consumption using the 2020 survey as the base. Model 2 (see Table A.7 in the Appendix) is used to model per capita consumption in the 2020 VHLSS.
Standard errors are in paratheses. Point estimates and standard errors are adjusted for complex survey designs.

Table A.69. Imputation results for the 1993-2008 period using VHLSS 2016 as the base survey and lasso regression

Welfare indicators	VLSS 1993	VLSS 1998	VHLSS 2002	VHLSS 2004	VHLSS 2006	VHLSS 2008
Panel A. Normal linear regression method						
Per capita consumption (thousand VND)	8909.6	13344.8	16833.0	20926.9	23235.1	28184.4
	(237.7)	(340.5)	(285.7)	(314.5)	(318.5)	(485.1)
Poverty headcount rate (percent)	85.3	69.2	57.0	42.2	35.2	25.8
	(1.0)	(1.3)	(0.7)	(0.8)	(0.8)	(0.7)
Poverty gap (percent)	44.9	29.2	21.4	14.0	11.1	7.6
	(1.0)	(0.9)	(0.4)	(0.4)	(0.4)	(0.3)
USAID poverty gap (percent)	52.7	42.1	37.5	33.3	31.6	29.4
	(0.7)	(0.7)	(0.4)	(0.5)	(0.7)	(0.7)
Food poverty headcount rate (percent)	70.9	47.6	34.6	22.1	17.1	11.4
	(1.3)	(1.5)	(0.7)	(0.7)	(0.7)	(0.6)
Vulnerability rate (percent)	6.4	11.7	14.2	16.0	16.0	14.7
	(0.4)	(0.6)	(0.3)	(0.5)	(0.5)	(0.5)
Panel B. Empirical distribution method						
Per capita consumption (thousand VND)	8954.6	13421.4	16969.7	21031.1	23379.6	28350.6
	(190.3)	(344.2)	(268.8)	(343.3)	(333.1)	(431.8)
Poverty headcount rate (percent)	85.4	69.9	57.7	42.8	35.7	25.9
	(0.8)	(1.3)	(0.7)	(0.8)	(0.8)	(0.7)
Poverty gap (percent)	45.2	29.4	21.5	14.0	11.0	7.5
	(0.8)	(0.9)	(0.4)	(0.4)	(0.4)	(0.3)
USAID poverty gap (percent)	52.9	42.1	37.3	32.8	30.9	28.8
	(0.7)	(0.8)	(0.4)	(0.6)	(0.7)	(0.7)
Food poverty headcount rate (percent)	71.4	48.4	35.0	22.0	16.9	11.0
	(1.2)	(1.5)	(0.7)	(0.7)	(0.7)	(0.5)
Vulnerability rate (percent)	6.2	11.2	13.8	16.1	16.2	15.2
	(0.4)	(0.6)	(0.3)	(0.5)	(0.5)	(0.5)
Adj R-squared	0.77	0.77	0.77	0.77	0.77	0.77
Obs. (the base survey)	9069	9069	9069	9069	9069	9069
Obs. (the target survey)	4799	5999	29530	9176	9178	9183

Note: This table reports the imputed estimates computed from the imputed per capita consumption using the 2020 survey as the base. Model 2 (see Table A.7 in the Appendix) is used to model per capita consumption in the 2020 VHLSS.
Standard errors are in paratheses. Point estimates and standard errors are adjusted for complex survey designs.

Table A.70. Imputation results for the 2010-2022 period using VHLSS 2004 as the base survey and lasso regression

Welfare indicators	VHLSS 2010	VHLSS 2012	VHLSS 2014	VHLSS 2016	VHLSS 2018	VHLSS 2020	VHLSS 2022
Panel A. Normal linear regression method							
Per capita consumption (thousand VND)	21952.7	23190.5	24624.5	27319.4	29455.8	32748.6	33406.3
	(305.0)	(334.6)	(294.7)	(316.9)	(382.3)	(393.0)	(379.8)
Poverty headcount rate (percent)	7.9	6.4	4.4	4.1	3.4	2.1	2.0
	(0.5)	(0.4)	(0.3)	(0.4)	(0.4)	(0.2)	(0.2)
Poverty gap (percent)	1.9	1.6	1.0	1.0	0.8	0.5	0.5
	(0.2)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
USAID poverty gap (percent)	24.4	24.6	22.9	24.3	23.8	21.7	22.8
	(0.9)	(1.1)	(1.1)	(1.3)	(2.0)	(1.5)	(1.8)
Food poverty headcount rate (percent)	2.7	2.2	1.4	1.4	1.1	0.6	0.6
	(0.3)	(0.2)	(0.2)	(0.2)	(0.3)	(0.1)	(0.1)
Vulnerability rate (percent)	7.3	6.0	4.7	3.9	3.4	2.4	2.1
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.2)	(0.2)
Panel B. Empirical distribution method							
Per capita consumption (thousand VND)	22029.1	23262.6	24690.8	27420.7	29535.6	32870.4	33518.9
	(290.0)	(301.0)	(334.7)	(329.5)	(392.5)	(457.0)	(462.4)
Poverty headcount rate (percent)	7.7	6.3	4.2	4.0	3.4	2.1	1.9
	(0.5)	(0.4)	(0.4)	(0.4)	(0.4)	(0.2)	(0.3)
Poverty gap (percent)	1.9	1.5	1.0	1.0	0.8	0.4	0.4
	(0.2)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
USAID poverty gap (percent)	24.3	24.3	22.8	24.1	23.6	21.3	22.4
	(0.9)	(1.0)	(1.0)	(1.2)	(1.6)	(1.5)	(1.7)
Food poverty headcount rate (percent)	2.7	2.2	1.3	1.4	1.1	0.6	0.6
	(0.3)	(0.2)	(0.2)	(0.2)	(0.2)	(0.1)	(0.1)
Vulnerability rate (percent)	7.4	6.0	4.6	3.7	3.3	2.3	2.1
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.2)	(0.2)
Adj R-squared	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Obs. (the base survey)	9178	9178	9178	9178	9178	9178	9178
Obs. (the target survey)	9399	9399	9399	9399	9396	9389	9398

Note: This table reports the imputed estimates computed from the imputed per capita consumption using the 2006 survey as the base. Model 2 (see Table A.7 in the Appendix) is used to model per capita consumption in the 2006 VHLSS.
Standard errors are in paratheses. Point estimates and standard errors are adjusted for complex survey designs.

Table A.71. Imputation results for the 2010-2022 period using VHLSS 2006 as the base survey and lasso regression

Welfare indicators	VHLSS 2010	VHLSS 2012	VHLSS 2014	VHLSS 2016	VHLSS 2018	VHLSS 2020	VHLSS 2022
Panel A. Normal linear regression method							
Per capita consumption (thousand VND)	21304.1	22519.1	23959.7	26425.6	28460.1	31891.6	32478.3
	(266.4)	(277.5)	(296.4)	(283.6)	(347.7)	(419.6)	(383.9)
Poverty headcount rate (percent)	8.3	6.6	4.5	4.1	3.5	2.1	1.9
	(0.5)	(0.4)	(0.3)	(0.3)	(0.4)	(0.2)	(0.2)
Poverty gap (percent)	2.0	1.6	1.0	1.0	0.8	0.5	0.4
	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
USAID poverty gap (percent)	24.0	24.0	22.4	23.8	23.8	21.4	21.9
	(0.8)	(0.9)	(1.1)	(1.1)	(1.8)	(1.4)	(1.7)
Food poverty headcount rate (percent)	2.8	2.2	1.4	1.4	1.2	0.6	0.6
	(0.3)	(0.2)	(0.2)	(0.2)	(0.2)	(0.1)	(0.1)
Vulnerability rate (percent)	7.8	6.4	5.1	4.1	3.6	2.5	2.2
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.2)	(0.2)
Panel B. Empirical distribution method							
Per capita consumption (thousand VND)	21382.9	22586.1	24032.5	26530.5	28540.9	32011.6	32595.6
	(274.9)	(303.6)	(286.7)	(317.5)	(357.2)	(459.6)	(417.7)
Poverty headcount rate (percent)	8.1	6.4	4.4	4.0	3.4	2.1	1.9
	(0.4)	(0.4)	(0.3)	(0.4)	(0.4)	(0.2)	(0.2)
Poverty gap (percent)	1.9	1.5	1.0	1.0	0.8	0.4	0.4
	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
USAID poverty gap (percent)	23.7	23.7	22.4	23.5	23.6	20.9	21.3
	(0.9)	(1.1)	(1.1)	(1.3)	(1.6)	(1.5)	(1.7)
Food poverty headcount rate (percent)	2.7	2.1	1.3	1.3	1.1	0.5	0.5
	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.1)	(0.1)
Vulnerability rate (percent)	7.8	6.3	5.0	3.9	3.5	2.5	2.2
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.2)	(0.2)
Adj R-squared	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Obs. (the base survey)	9178	9178	9178	9178	9178	9178	9178
Obs. (the target survey)	9399	9399	9399	9399	9396	9389	9398

Note: This table reports the imputed estimates computed from the imputed per capita consumption using the 2006 survey as the base. Model 2 (see Table A.7 in the Appendix) is used to model per capita consumption in the 2006 VHLSS.
Standard errors are in paratheses. Point estimates and standard errors are adjusted for complex survey designs.