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TECHNICAL POVERTY ESTIMATION REPORT

Myanmar Poverty and Living Conditions Survey

Ministry of Planning and Finance

WORLD BANK GROUP

This technical report is a joint effort of the Government of Myanmar, Ministry of Planning and Finance, and the World Bank. The report is a product of the World Bank's programmatic poverty work in Myanmar.

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Abbreviations

ADB	Asian Development Bank
CBN	Cost of Basic Needs
EA	Enumeration Area
GOM	Government of Myanmar
IGC	International Growth Centre
IHLCA	Integrated Household and Living Conditions Assessment
ILO	International Labour Organization
MI	Multiple Imputation
MNPED	Ministry of National Planning and Economic Development
MOH	Ministry of Health
MOPF	Ministry of Planning and Finance
MPLCS	Myanmar Poverty and Living Conditions Survey
NGO	Non-governmental Organization
SC	Steering Committee
TWG	Technical Working Group
UNDP	United Nations Development Programme
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
UNOPS	United Nations Office for Project Services
WFP	World Food Programme

Executive Summary

A joint analysis of poverty and living standards was conducted by a technical team from the Ministry of Planning and Finance, Government of Myanmar, and the Poverty and Equity Global Practice of the World Bank.

Poverty has previously been estimated using data from the Integrated Household Living Conditions Survey conducted in 2004/05 and 2009/10.

Using this earlier data, poverty in Myanmar has been estimated using two different approaches. Poverty was initially measured by the Government of Myanmar and its development partners using data from IHLCA-I ("MNPED et al (2007)" methodology); this first measure of poverty based the poverty line and estimate in the living conditions of 2004/05. Poverty was estimated to be 32.1 percent in 2004/05 and was estimated to have dropped to 25.6 percent in 2009/10 (MNPED et al, 2007 and MNPED et al, 2011). A poverty estimate based on 2009/10 standards of living was put forward by the World Bank in 2014 ("World Bank (2014)" methodology), using data from the IHLCA-II. The World Bank estimated poverty to be 37.5 percent in 2009/10 (World Bank, 2014).

The objectives of the joint poverty analysis by the Ministry of Planning and Finance and World Bank were to:

(i) put forward trends in poverty between 2004/05, 2009/10 and 2015;

(ii) present a measure of poverty that reflects the situation of poverty in Myanmar in 2015 and;

(iii) conduct analysis about the situation and nature of poverty in Myanmar that informs policy choices and strategies.

The first report emerging from the joint assessment, Part One, put forward trends in poverty over time using the two poverty estimation methodologies previously used in Myanmar.

The first report also made the recommendation to revise and rebase the poverty estimates to reflect the needs of the poor in 2015 emerged from the initial stages of the joint analysis of poverty. Updates to a country's welfare aggregate and poverty line are recommended approximately every ten years to reflect changes in living conditions that occur as a country gets richer (such as a shift in the basket of goods from food to non-food goods) and to reflect changes in survey and poverty estimation methodology.

A second poverty report, Part Two of the Poverty Assessment, puts forward a revised and rebased poverty estimate and method to reflect the needs of Myanmar's poor in 2015 ("MOPF and World Bank (2017)" methodology).

This technical report accompanies Part Two of the Poverty Assessment. The report is intended for a technical reader who would like to explore the details of the poverty measurement exercise. The results and deeper analysis emerging from the poverty measurement exercise are presented in the Part Two report.

The revised and rebased poverty estimate is based on a revised measure of welfare that is calibrated to living conditions in 2015, and a re-estimated poverty line. There are three key differences between the new welfare measure and the welfare measure previously used by the Ministry of National Planning and Economic Development. First, durable use value is included to reflect the growing importance of home assets, such as electric fans, solar batteries and mobile phones in households in Myanmar. Durables were not included in the MNPED et al (2007) methodology. Second, the calorie norm and adult equivalent parameters used were revised to reflect updated calorie estimates produced by the Ministry of Health and Sports. The new poverty line is based on a basket of 2238 calories, compared to 2300 calories used in the two previous poverty methodologies. The calorie estimates used in this poverty measurement exercise are more finely cut than those used in the previous exercises. In previous poverty estimations, all children under the age of 15 were treated as having similar needs while in this estimation, for example, a 2-year-old is treated as having different needs to a 10-year-old. Finally, the new consumption aggregate and poverty line are based on the food and non-food consumption patterns of the population in 2015, compared to 2004/05 in the case of MNPED et al (2007) methodology.

Based on the recommended revised and rebased poverty estimation method, we find that 32.1 percent of the population were poor in 2015 and 9.8 percent of the population were food poor. Using this new method, we see a decline in poverty over time between 2004/05 and 2015. The decline in poverty is consistent with the patterns of poverty reduction reported in Part One of the Myanmar Poverty Assessment (MOPF and World Bank, 2017). Poverty in Myanmar's farms and villages (rural areas) is substantially higher than that in its towns and cities: 38.8 percent of the rural population are estimated to be poor compared to 14.5 percent of those in its towns and cities. This amounts to 15.8 million poor in total, of which 13.8 million are found in rural areas and 2 million are found in urban areas. We are unable to estimate state or region level poverty due to the small sample size of the survey. There is substantial geographic variation in poverty. The headcount rate of poverty in the Coastal areas and in the Hills and Mountains is significantly higher than the average seen in Myanmar, and that seen in the Delta and Dry Zone. Despite having lower rates of poverty, the population dense Delta and Dry Zone are home to two thirds of Myanmar's poor. We find similar patterns in the new poverty method based in 2015 living conditions over time, notably we see a decline in poverty from 48.2 percent in 2004/05 to 32.1 percent in 2015.

01.

Overview of Content

Overview of Content

The technical poverty measurement report describes the estimation of poverty in Myanmar by a joint team from the Government of Myanmar, Ministry of Planning and Finance (MOPF) and the World Bank's Poverty and Equity Global Practice and Living Standards Measurement Survey Team.

The joint analysis had three interlinked objectives:

1. To construct comparable poverty estimates over three survey waves using the two methodologies previously used to estimate poverty in Myanmar.
2. To propose a method that could be used to estimate poverty in 2015.
3. To conduct analysis of the correlates and determinants of poverty, to provide an overview of the critical human and economic development needs in Myanmar.

The technical collaboration between the World Bank and MOPF has led to four reports:

1. Survey Conduct and Quality Control Report for the Myanmar Poverty and Living Conditions Survey, (MPLCS), 2015;
2. Analysis of Poverty in Myanmar:

a. Part I: Trends between 2004/05, 2009/10 and 2015, based on previous measurements

b. Part II: Poverty trends and profile based on the new poverty estimates

3. Technical Poverty Estimation Report, accompanying Part II of the Poverty Analysis

This report proceeds as follows. Section 2 discusses the institutional arrangements for poverty estimation. Section 3 documents the steps taken to estimate poverty in Myanmar in 2015, and puts forward a revised and rebased method for doing so. Detailed annexes explore the assessment of assumptions used to construct the aggregates, the food basket, and calories, among others.

02.

Institutional Arrangements

Institutional Arrangements

A Steering Committee for the Myanmar Poverty and Living Conditions Survey was established in July 2015 by the President's Office. The Ministry of Planning and Finance was represented by the Chair and Secretary, and the Ministries of Health, Education, Agriculture and Rural Development, Livestock and Fisheries were represented by members. Representatives from the development partner community participated as members of the Technical Working Group and Steering Committee. The Technical Working Group included representatives from the United Nations Development Programme (UNDP), Asian Development Bank (ADB), United Nations Children's Fund (UNICEF), World Food Programme (WFP), International Labour Organization (ILO), United Nations Population Fund (UNFPA) and International Growth Centre (IGC). The Steering Committee included representation from the World Bank, UNDP and ADB.

03.

A Revised and Rebased Measure of Poverty reflecting living conditions in 2015

This section presents a revised and rebased estimate, using 2015 standard of livings to base the basket of the poor. The recommended revision is timely from an international perspective, aligned with the end of the Millennium Development Goals and the subsequent start of the more ambitious Sustainable Development Goals. The update is also well timed from a national perspective: elections in late 2015 marked a historic change in administration that defines a new era in Myanmar's democratic process.

The methodology used has been revised over previous methodologies, to reflect updates in poverty measurement techniques. Ensuring the rigor and technical soundness of the poverty measure is a necessary precondition to a meaningful debate around poverty issues and in the development of a coherent strategy for poverty reduction. In this section, we provide a detailed description of the methodological steps and assumptions followed in the construction of a poverty line and measures for Myanmar using the 2015 household survey data.[2] The layout of this section follows the four steps involved in constructing a measure of poverty for Myanmar:

Step 1: The first and most important step in poverty measurement is the construction of a comprehensive and replicable consumption aggregate. Since this is the measure on which all subsequent steps are reliant, this is a fundamental step. The guiding principle in defining a comprehensive and credible measure of household welfare is that it should create a reliable ranking of individuals.

Step 2: Second, we apply an appropriate poverty line to this aggregate that reflects the basic minimum needs of society. This captures an absolute standard of living below which a household is considered poor. The guiding principle in this step is to create a definition of poverty that is applicable to the basket of goods consumed by poor households in Myanmar and that can be consistently applied across all households in the country.

Step 3: We produce measures of poverty that aggregate household welfare into a summary statistic. The poverty headcount, the most commonly used measure, captures the share of the population that is considered to be poor. Two other common measures are the poverty gap and the squared poverty gap. These second measures are more sensitive to how far a household is from the poverty line.

Step 4: We conduct a series of sensitivity checks to assess how robust poverty measures and the poverty profile are to the assumptions made in the process of constructing the poverty profile. These assumptions range from the use of adult equivalence scales to the inclusion of various components of the sub-aggregates (such as health).

2 This discussion draws heavily on a number of influential texts in poverty measurement, notably Ravallion (1994), Deaton (1997), Deaton and Zaidi (2002) and Haughton and Khandker (2009).

3.1 Step 1: Definition of New Consumption Aggregates Using the 2015 MPLCS

The most commonly used indicators of welfare are either based on household consumption or on household incomes. The choice of welfare indicator depends on the availability and quality of data from household surveys, as well as on socio-economic conditions in the country. In the context of Myanmar, a welfare aggregate based on consumption expenditures is likely to provide a more accurate indication of a household's well-being than an aggregate based on income.[3] There are two clear reasons for this. First, income typically fluctuates across seasons, while consumption is more likely to remain stable as households shelter themselves from shorter-term fluctuations in incomes. Second, and more practically, households are more likely to accurately recall what they have consumed than what they have earned. Household income is difficult to measure accurately in a context of high self-employment and subsistence agriculture. For such reasons, and in line with previous poverty analysis in Myanmar (MNPED et al., 2011), we use consumption expenditure as our welfare measure.

As discussed in Deaton and Zaidi (2002), the component of consumption can be aggregated into four main classes, namely, (i) food items, (ii) non-food items, (iii) consumer durables, and (iv) housing. Consumption includes both goods and services that are purchased and those that are provided from one's own production (in-kind). In this next section, we describe each component constructed including key assumptions. We then discuss how nominal household expenditure is deflated to take into consideration spatial price differences, and temporal variation over the four months of the survey and household composition.

3.1.1 Food expenditures[4]

Households typically consume food from various sources, from market purchases, to producing them at home or receiving them as a payment for labor or as a gift. The food expenditure aggregate captures all food consumed by a household, regardless of its source. Estimating food expenditures requires information on both the quantities that were consumed and the prices of these items. The food module of the MPLCS, conducted in 2015, asks households to report consumption for foods in twelve broad categories: (i) rice and cereals; (ii) pulses, beans, nuts and seeds; (iii) roots and tubers; (iv) meat, dairy and eggs; (v) fish and other seafood; (vi) vegetables; (vii) fruits; (viii) oils and fats; (ix) spices and condiments; (x) other food products; (xi) alcoholic beverages; and (xii) food consumed away from home.

3 Ravallion (1994), Deaton (1997), and Deaton and Zaidi (2002) provide a more detailed theoretical and empirical introduction to identifying the welfare aggregate. We note that the narrow focus on tangible components of living standards does not imply that we regard other dimensions that are more difficult to capture in a single monetary measure, such as access to improved water sources or sanitation, as less important. These dimensions need to be carefully scrutinized separately.

4 We tested the sensitivity of our food aggregates, and subsequently the poverty estimates, to differences in underlying assumptions in unit values, specifically the source of prices and the price imputation approach used. The descriptive analysis presented below puts forward the final and preferred approach described in the text; the alternative assumptions are described in Annex A1.

Quantities

Two principal questions capture household food consumption and are the foundation of the food aggregate:

(i) Was a food consumed by the household over the last 7 days?

(ii) How much was consumed during this time frame?

Households were allowed to report quantities using the measurement unit with which they felt most comfortable. This varies between foods. For example, mangoes are typically reported by the number of fruit while rice is reported in condensed milk cans. We convert all quantities and expenditures on food items to a uniform reference period.

Before applying prices, quantities are converted from non-standard units to a standard unit (kilograms). The approach used depends on whether units have standard imperial or metric magnitudes, or are "non-standardized". To convert imperial and metric units to kilograms, the conversion factors were derived from Appendix 5 of the 2009/2010 Integrated Household and Living Conditions Assessment (IHLCA-II) Technical Report (MNPED et al., 2011b).

Table 3.1

Conversion to kilogram

Standard unit	Kilogram
1 gram	0.001 kg
1 pound	0.453592 kg
1 Kyattha	0.0163293 kg
1 Viss	1.63293 kg

To convert non-standard volume and count units (i.e. pyi, number, bundle) additional information was collected when conducting the survey. Available information includes: (i) weights of non-standard volumes and count units collected in the community questionnaire using scales during market observation; and (ii) the calculated weight of each food item reported in the household survey in non-standard units, as determined by the application of these collected conversions factors after the interview was conducted. Since both sets of data showed variation caused by outliers, we calculated for each item the national median of conversion factors determined during market observation, based on a large number of observations, and apply these conversion factors to both household and market quantities. This allows us to measure all foods in kilograms, regardless of the unit of purchase.

The MPLCS asked households to identify how much of the food consumed in the last seven days was self-produced and how much was received as a gift or in-kind transfer (e.g. payment for labor). This distinction of source does not enter into the consumption aggregate and therefore does not affect poverty estimates. It is however useful information for welfare analysis, allowing examination of how many households are reliant on own-production to meet their dietary needs.

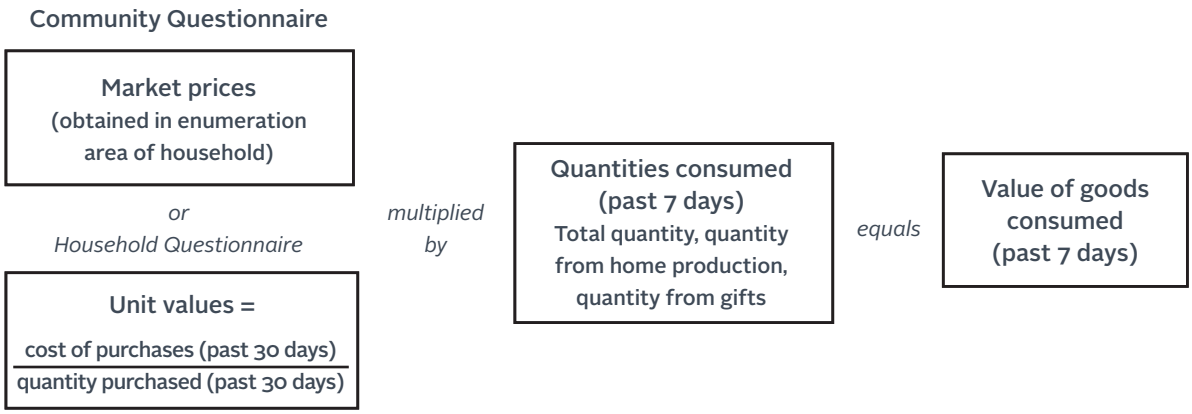
Prices

Prices are needed to estimate how much a household consumes in monetary terms. The MPLCS has two sources of information for prices. First, households report the total value of purchases during the past 30 days for each item, along with the quantity purchased. Dividing expenditures by quantities gives "unit values", i.e. implicit prices. These unit values are influenced by quality choices—someone who buys better quality fish will pay more per unit than someone who buys lower quality fish. Second, a price questionnaire was fielded as part of the community module. The price questionnaire measures prices in the markets used by survey households. While in principle this provides a direct measure of goods, the enumerators do not make purchases, potentially resulting in differences between measured prices and those paid in actual transactions.

We use both household and market sources to value the quantities consumed in the last seven days. Substantial sensitivity analysis of prices was undertaken before settling on the approach that was used, since they are a key variable in the estimation of food expenditures and subsequently of poverty.

Figure 3.1

Methodology of price calculation



Prices can be reported in both standard units and non-standard units. This occurs where households in the enumeration area consumed an item in multiple different units. For example, one household reports consuming rice in condensed milk cans while the other reports consumption in pyi. Where both information in standard and non-standard units is available (756 cases), we use the market price derived from non-standard units, under the assumption that this more accurately represents household purchasing behavior.

Price Imputation

To calculate (impute) prices when necessary, we use a mix of household- and community-level data. Household unit values can only be calculated for those households that report consuming the item over the last 7 days and purchasing the item in the previous 30 days. A household may consume an item but not purchase it for a variety of reasons. For example, a household may consume certain items exclusively from home production or a household may consume some non-perishable items such as oil or spices over a long time period.

In the instances where we do not have household-level prices, we replace missing household unit values for consumed items with unit values from the local market. We do not however have prices for all goods at either the household- or local market-level. Market prices could be missing because, for example, a particular item was not offered on the day the community survey was conducted in a particular market. In a very limited number of cases both market prices and unit values can be missing because merchants or households report non-standard volume or count units that cannot be converted into a common standard unit.

If both household and local market prices are missing, we use two strategies to find feasible proxies. First, we use an approach that follows the recommendation of Deaton and Zaidi (2002). This approach is based on imputing the median price or unit value from increasingly larger geographic levels of aggregation. We replace missing unit values of an item with the median unit value of non-missing observations if we have at least three observations of a price for this item in a given geographic level. Community-level prices are treated as one observation. For example, if all enumerated households in a village tract report consuming rice but rice prices are only captured in one household and in the community module, this would count as two observations coming from this village tract.

If there are not enough non-missing unit value observations in the same enumeration area, we repeat the procedure at the level of wards/village tracts, townships, districts, states or regions, and finally at the national level. Note that we differentiate between rural and urban areas, for example replacing rural missing values first with the nearest rural observations before moving to higher levels of aggregations. We examine the sensitivity of poverty and inequality measures to our approach to measuring prices by using different combinations of household and community prices. We also examine the use of a nearest neighbor approach which involves matching a community with a missing price to the most geographically proximate community with a reported price, to impute the nearest enumeration areas with prices for an item, as an alternative to the geographic level approach.

Other foods consumed

For each of the twelve broad food categories covered in the MPLCS, the respondent is asked to report consumption of pre-defined sub-categories. Respondents are also allowed to report the consumption of items that fall outside of the listed sub-items. For example, a list of 24 vegetables was specified in the household survey, but if a household ate a vegetable that fell outside of this list they could report it under "other". The items consumed under "other" were specified to some level of detail in the processed data, allowing for detailed analysis and post-coding as necessary.

Items falling under the "other" categories are more heterogeneous than specified items. The share of "other" categories in the total number of items consumed is 2.12 percent.[5] Of these "other" items, 20 percent are "other peas", about 30 percent "other vegetables", and about 17 percent "other oil and fat". We looked at the distribution of unit values per item and found them to be unproblematic. Thus we applied unit values to those items in the same manner as specified items.

5 A detailed fish and seafood section is included in the MPLCS. This section includes commonly found river and sea fish as well as non-specified river and sea fish that are separated by their length, for example "other medium river fishes between 5 and 10 inches". These fish categories are not included in our assessment of "other" items due to the level of detail and disaggregation they include. Fish in the "other" category are separated into 12 different size, source and processing groups that are important determinants of calorie content and one broad "other" category. The disaggregated groups provide detailed information that can be used for assessing nutrition content. For example, dried fish has a higher calorie content than fresh, while river and sea fish differ quite substantially in oil and fat content. We have 12314 reports of fish products of which 3011 are reports within the "other" fish categories. Of these 3011 "other" reports, only 116 reports are within the broader "other" category.

Foods away from home

A final component of total food consumption is the total value of meals consumed outside the household, for example, meals eaten at a friend's house, at their employer, in a tea shop or at a restaurant. Respondents are asked to report whether they have taken any meals outside the house in the last seven days. If so, they are asked whether they consumed breakfast, lunch, dinner or snacks away from home. After capturing this information, they are asked how much was spent in total on each of these meal types and also the value of any meals received in kind. Since households report total expenditure on foods eaten away from home, there is no need for imputation of unit values.

Outlier correction

We correct outliers on an item-by-item basis. To correct outliers in unit values, we replace unit values below (or equal to) the 1st percentile and above (or equal to) the 97th percentile to missing and impute these as described below. We choose a smaller percentile at the lower end of the distribution, as the distribution is right skewed.

For outlier correction of quantities, we replace outliers by item (and variant) above the 97th percentile per capita with the value of the 97th percentile per capita to keep information on relatively large amounts consumed. Outliers in rice consumption were corrected aggregated over all rice varieties.[6]

Descriptive Analysis

Figure 3.2 presents median spatially deflated food expenditure per adult equivalent per day broken down by quintile, agro-ecological zone and urban and rural areas. It is notable that per adult equivalent expenditures per day are similar and low in the bottom half of the food expenditure distribution in Myanmar and subsequently these households are likely to have similar spending patterns. Mean expenditures are 476 kyat per adult equivalent per day for the bottom quintile of the food expenditures distribution, 731 kyat per adult equivalent per day in the second quintile and 1094 kyat per adult equivalent per day for the mean food expenditures in Myanmar. Food expenditures are higher in urban areas than in rural areas, and highest in the Delta region, likely reflecting higher spending in the urban areas of Yangon. This is not merely reflection of higher prices in urban areas—although prices for the same food products do tend to be higher in urban areas rather than in rural—but a reflection of higher total expenditures and a higher quality food basket.

6 We tested the sensitivity of the poverty estimates to an alternative median correction approach.

Figure 3.2

Mean food expenditure per adult equivalent per day

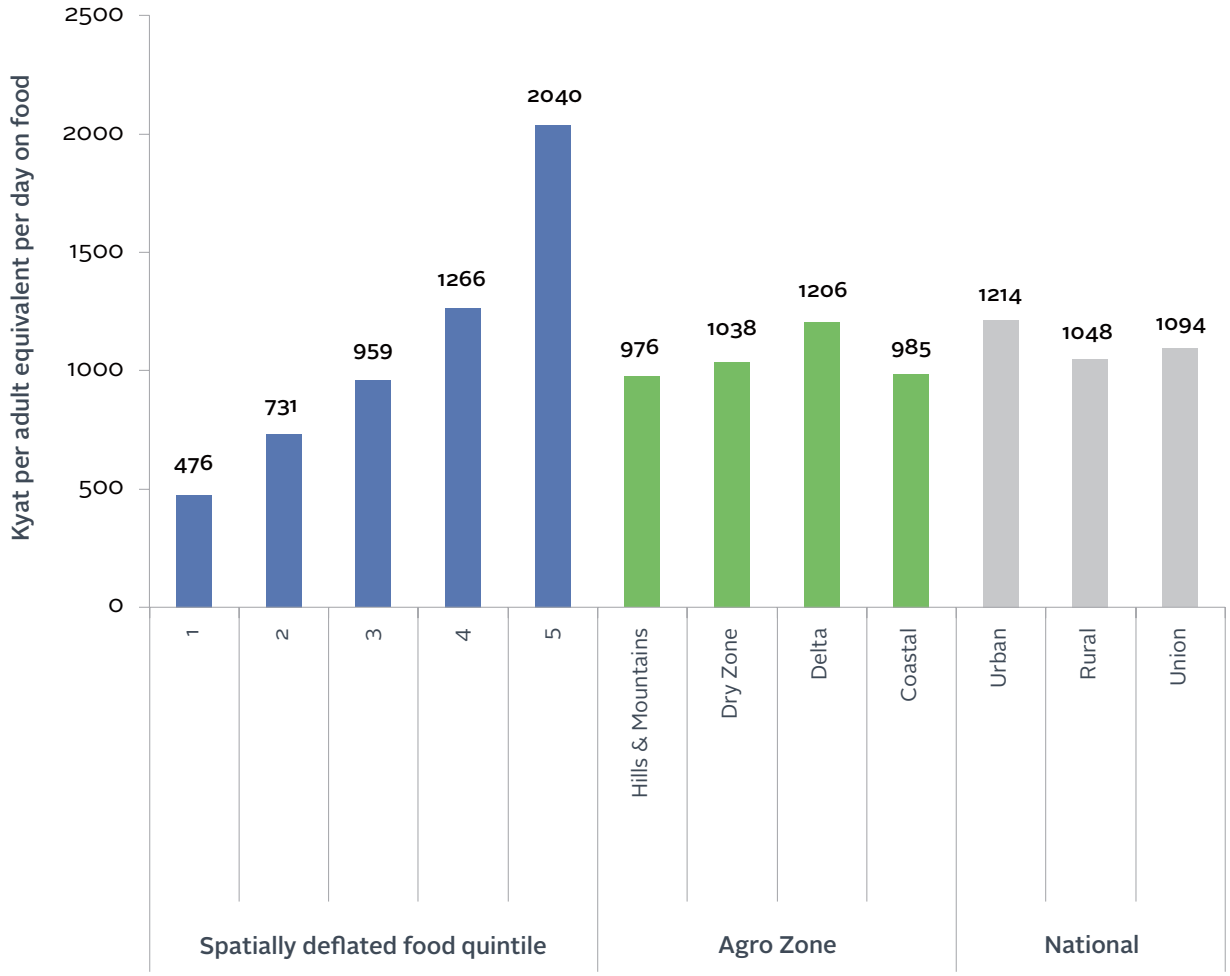
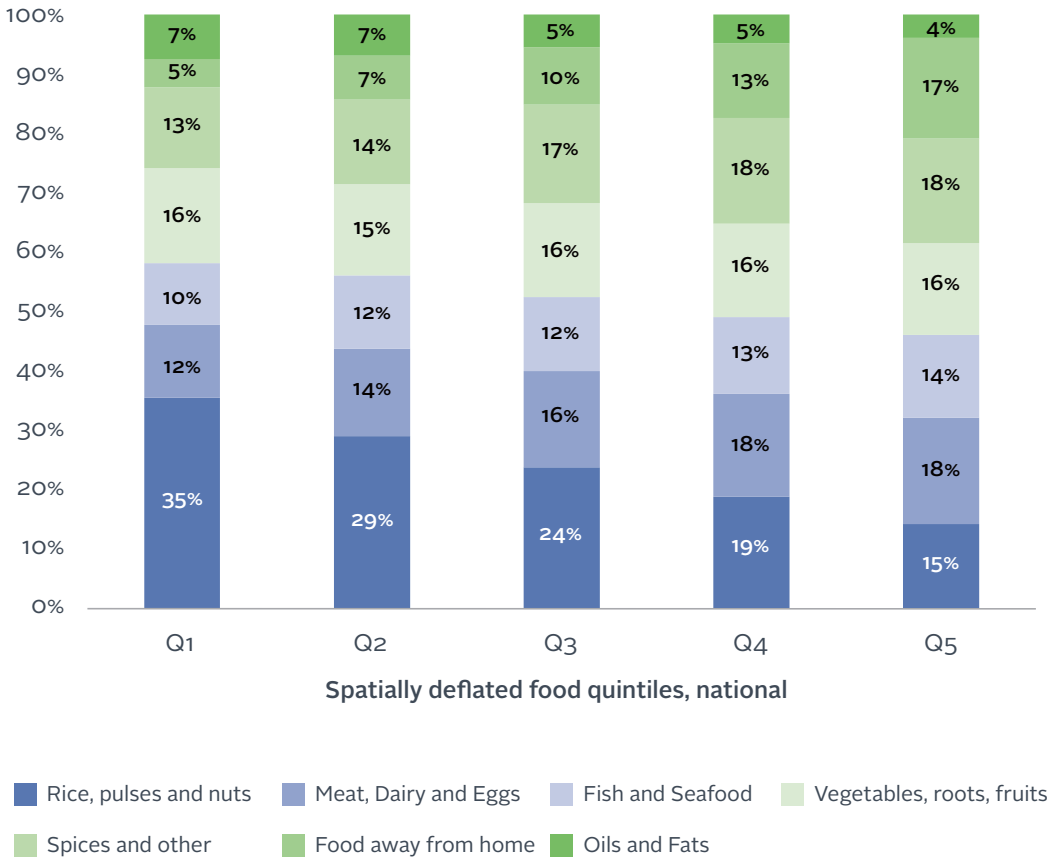


Figure 3.3 shows the share of expenditures devoted to these various food products by quintile. The share of expenditures on rice and pulses drops as one climbs the food expenditure distribution, a finding that is expected and consistent with households diversifying their food intake as they become wealthier. The share of expenditures devoted to proteins such as fish, meat, dairy and eggs rises moderately as households become wealthier. Dietary diversity is lower in rural areas than in urban. Households in rural areas spend more on rice and pulses than those in urban areas, both in absolute terms and as a percentage of total expenditures. The average rural household devotes 26.1 percent of food spending on rice and pulses, compared to 19.2 percent for the average urban household. Urban households meanwhile devote 32.2 percent of total expenditures to protein-intensive food, such as meat, dairy, fish and eggs, compared to 26.6 percent of spending in rural areas.

Figure 3.3

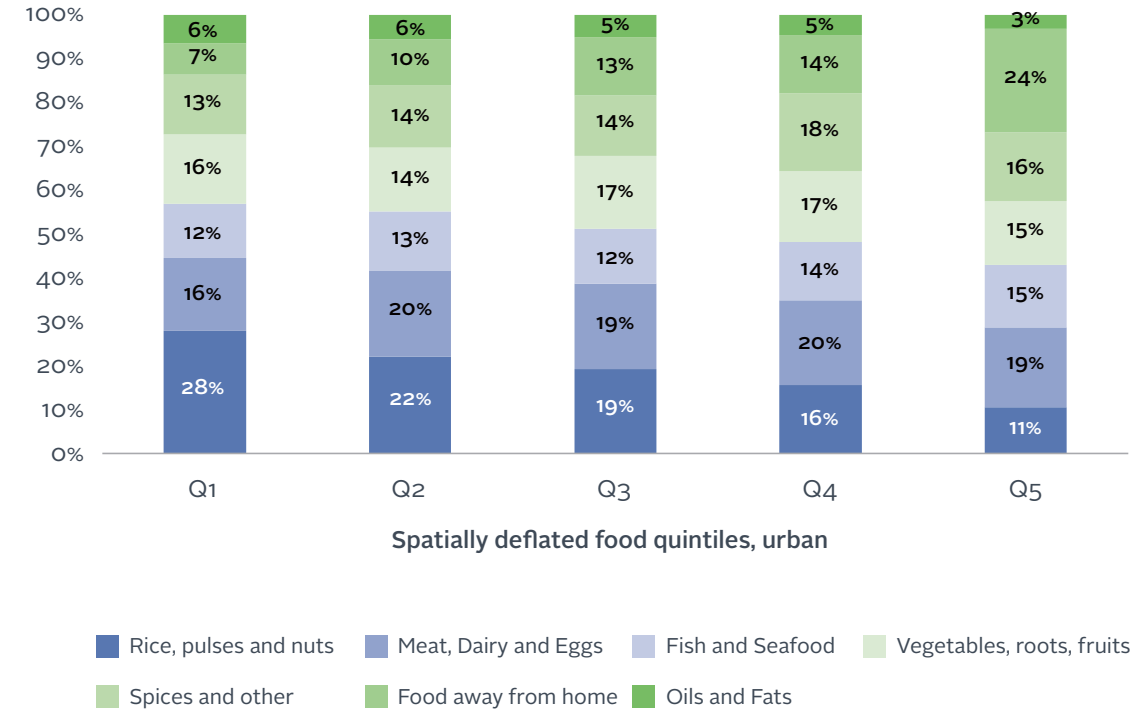
Food consumption expenditure by item

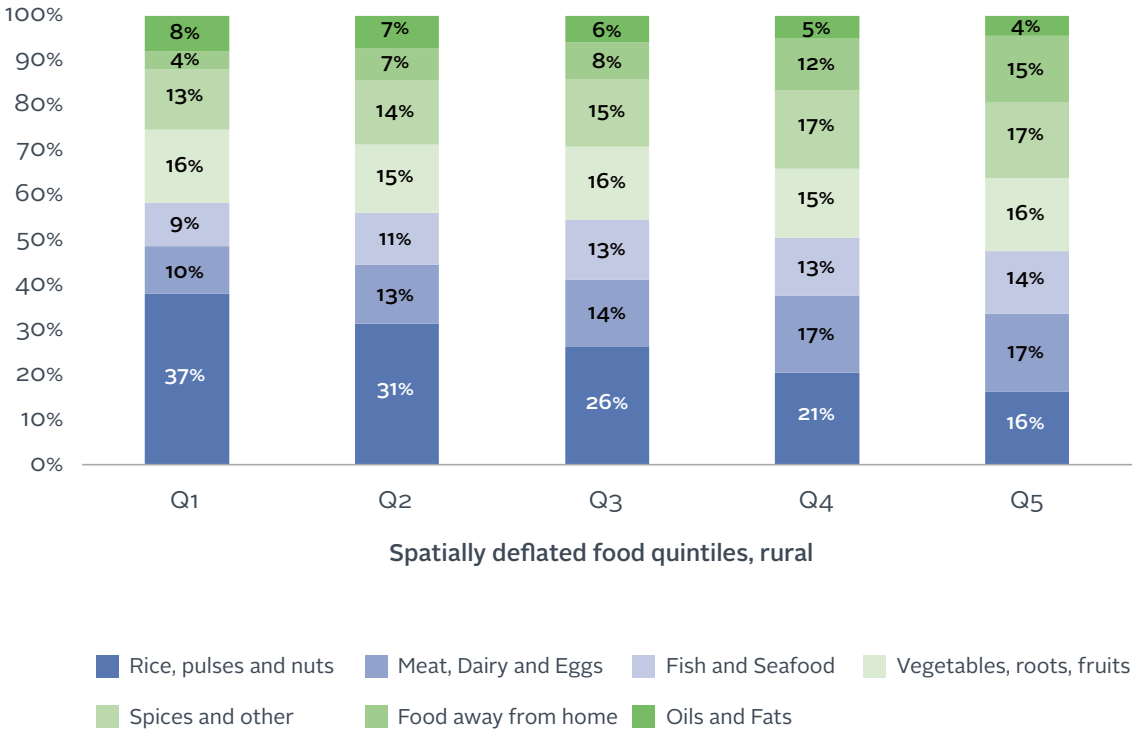


The share of expenditures on food away from home is 3.7 times higher in the top quintile compared to the bottom quintile of households. There are relatively more urban dwellers in the top quintile than the bottom— 10 percent of those found in the bottom quintile are in urban areas, compared to 80 percent of those in the top. The higher share of food away from home is partly a reflection of differences in the urban-rural composition of food; in urban areas where individuals may work far from their homes, and where tea shops and food stalls are readily found, all households tend to spend more on food away from home.

Figure 3.4

Urban and rural food consumption expenditure by item





3.1.2 Non-food expenditures

In addition to food expenditures, our expenditure aggregate includes non-food items that households require to achieve a basic minimum standard of living. Non-food items span various goods and services, including expenditure on energy and fuel, education, transportation and clothing.

The MPLCS collects information on a wide range of non-food items such as energy, water, items of daily use and cosmetics, apparel, transportation, and telecommunications. In addition, the survey collects data on health and education expenditures for all household members. To account for different purchasing patterns of various items, data is collected for different reference periods. Because non-food items are largely heterogeneous goods, the MPLCS only collects data on the total value of non-food purchases, not on the quantities of items.

The difficulty of the non-food component lies in the choice of items to include. This choice depends on data availability and ultimately on the analytical objective of the welfare measure. We follow three guiding criteria to determine whether an item is included or excluded: (1) Does the expenditure related to the particular item represent an investment with the expectation of a future welfare increase (such as schooling), as opposed to consumption that more immediately increases welfare (such as soap or petrol)?; (2) Does the particular item represent a large but infrequent ("lumpy") expenditure (such as marriages, dowries, births and funerals) and, if so, how can we treat it in the consumption aggregate?; and (3) Is the expenditure in any way related to household welfare? Such items include taxes and fees paid, and transfers to other households. Expenditures that might not reflect an increase in household welfare (such as health spending) are treated in more detail below and expenditures on durable consumption goods such as household appliances are treated separately in the next section.

Following these inclusion criteria, we exclude the following items from the non-food aggregate:

- Weddings and funerals
- Expenditures on gold, jewelry, gems and precious stones
- House repairs and expenses, including property taxes
- Transfers to other households

After choosing the appropriate list of items to be included (Table 3.2), we calculate the total value in kyat for each item by adding cash expenditures and the value of the items that the household received in-kind for consumption. Spending is converted to a uniform annual reference period by multiplying an appropriate factor. We then sum spending across items for each household.

In composing the non-food aggregate, we use total expenditures on education as reported by households. Households report total expenditures and in some cases disaggregated data by category of expenditure (school fees, donations, uniforms, textbooks, coaching/tutoring, room and board, transportation, pocket money, and other costs). For households that report disaggregated data but where the sum of sub-aggregates is different from total reported expenditure, we use total expenditures on education.

An area of some debate in the field of poverty measurement is the inclusion of health expenditures. An argument commonly made for excluding health expenditures is that they often reflect a “regrettable necessity” that does little to increase household welfare (Deaton and Zaidi, 2002). However, not including health expenditures would not capture differences between two individuals, one of whom can afford treatment, whereas the other one cannot.

Table 3.2

Items included in the non-food aggregate

Items	Inclusion
Non-food items	
Energy for household use	√
Water	√
Cosmetics and personal apparel	√
Medicines and drugs not included in health module	√
Local transport	√
Other non-food items, incl. telecommunications	√
Clothing and apparel	√
of which: Gold jewelry, gems, and precious stones	x
Home equipment	√
House repairs and expenses, incl. property taxes	x
Travel and trips, excl. for medical and health reasons	√
Other expenses, e.g. weddings, funerals, transfers	x
Health and education	
Health, including medicines	x
Education, incl. vocational training and travel	√

The fundamental problem with health expenditures lies in our inability to measure the cost of welfare losses from sickness. If we could value precisely such welfare losses, we could compare them to the presumed welfare gains of receiving treatment.

The financing of health expenditures poses additional problems. Simply including total expenditures when some individuals receive free or subsidized treatment can be misleading. The MPLCS includes information on whether an individual received such subsidized or free treatment, but it does not break down the amounts subsidized. An assessment of demand-side programs to support health care provision conducted by the World Bank in 2015 suggests, however, that the magnitude of such programs is small in Myanmar, thus this concern is likely to be mitigated (World Bank, 2015).

Estimating the elasticity of health expenditures with respect to total expenditures can help to determine whether they should be included in the non-food aggregate. A high elasticity would support inclusion, while a low elasticity would suggest exclusion. The elasticity of health expenditures in Myanmar is 0.73, a result that can be contrasted with the higher elasticity of education expenditures with respect to total expenditures (Table 3.3).

The low elasticity of health expenditure signals a reasonably strong case for excluding it from the consumption aggregate.

Table 3.3

Health and education elasticity of expenditure

		Health Elasticity		Education Elasticity	
Country	Year	Elasticity	t-statistic	Elasticity	t-statistic
Vietnam	1992-93	0.85	33.2	1.35	46.8
Nepal	1996	0.75	20.9	1.65	43.5
South Africa	1993	1.14	58.7	1.32	67.2
Brazil	1996-97	0.85	31.0	1.25	47.9
Myanmar	2015	0.73	10.5	1.11	22.9

Source: Deaton and Zaidi (2002)

It should be noted that excluding health care from the aggregate does not imply that health care expenditures are not important and shouldn't be analyzed – to the contrary, we would recommend that health is extensively analyzed in Myanmar given the high level of out of pocket spending that can be seen in the MPLCS as well as the substantial spending on health care by the poor. Analysis of health care spending in the poverty assessment signals that poor health is linked to difficulties for households, from needing to take often high interest loans to cover health care expenditures to limiting labor force participation. The findings in the poverty assessment uphold the decision not to include health care in the aggregate: these expenditures are associated with shocks that limit household welfare. They also signal that there is a great need to do further study on the implications of poor health for poverty and well-being in Myanmar.

Descriptive Analysis

Household resources on non-food items are spread across a diverse range of items. Necessities such as energy, personal apparel, and cleaning and sanitary products, dominate the baskets of the households spending the least on non-food expenditures. Among these households, 36 percent of total non-food expenditure is devoted to energy, which includes electricity from the national grid, electricity from a private source, firewood, fuels and candles.[7] The share of non-food expenditures devoted to energy is substantially higher in rural areas than in urban, on average as well as among richer and poorer households. The share of non-food resources devoted to energy in rural areas remains above 24 percent in all households, while in urban areas it ranges from 12 percent for the best off households to 31 percent among poorer households (Figure 3.5). Relatively few households in rural areas are connected to the public electricity grid, resulting in a diversity of spending to alternative sources of energy.

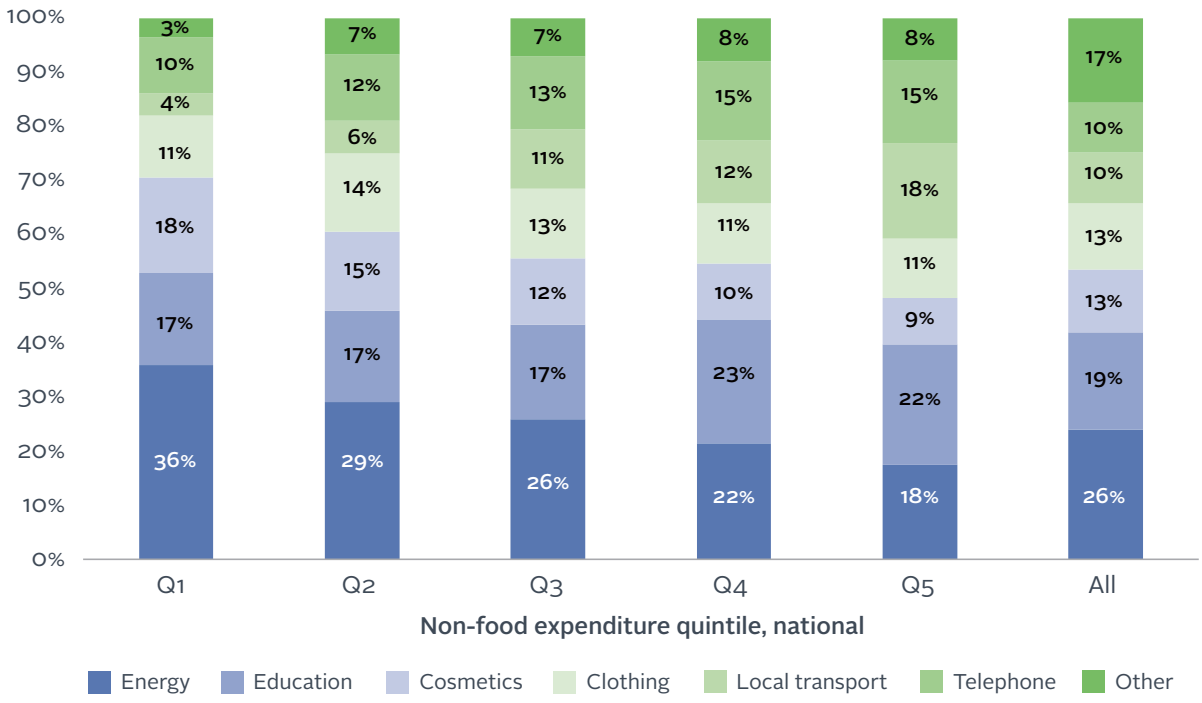
The share of non-food expenditures devoted to transportation (excluding maintenance costs) rises substantially across the expenditure distribution, from 4 percent to 18 percent. The increase in spending on transportation can be seen in both rural and urban areas.

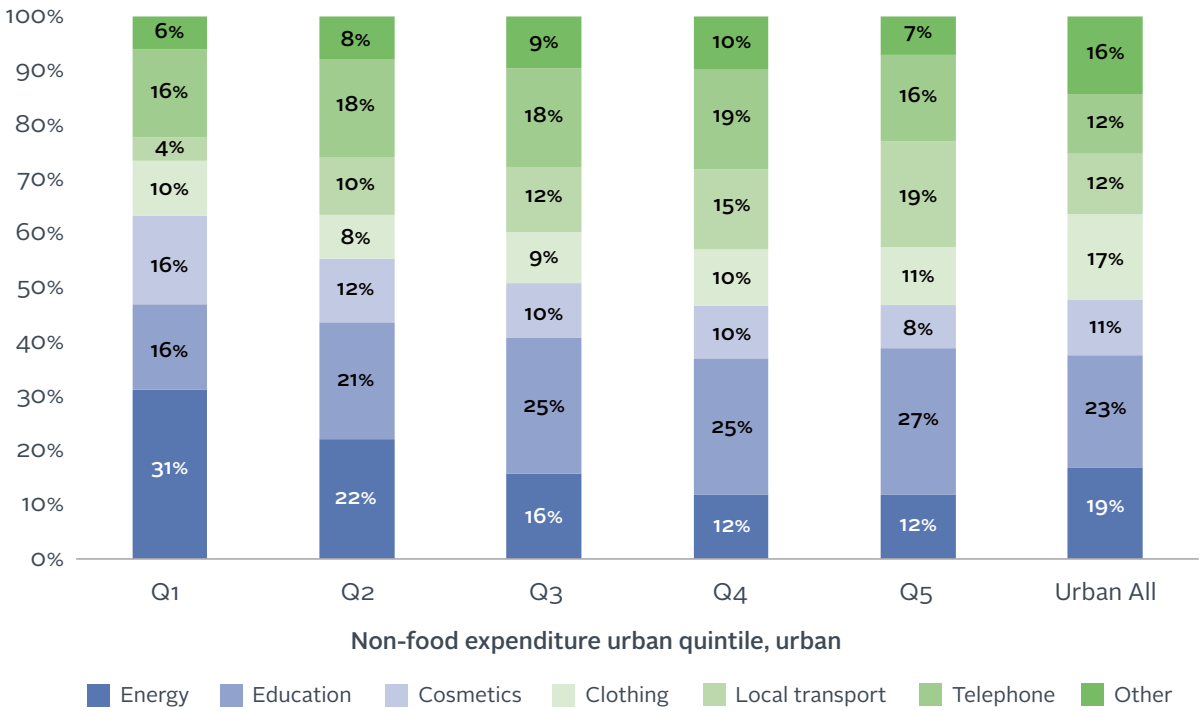
7 We do not impute the value of gathered firewood, an important source of energy among poor households.

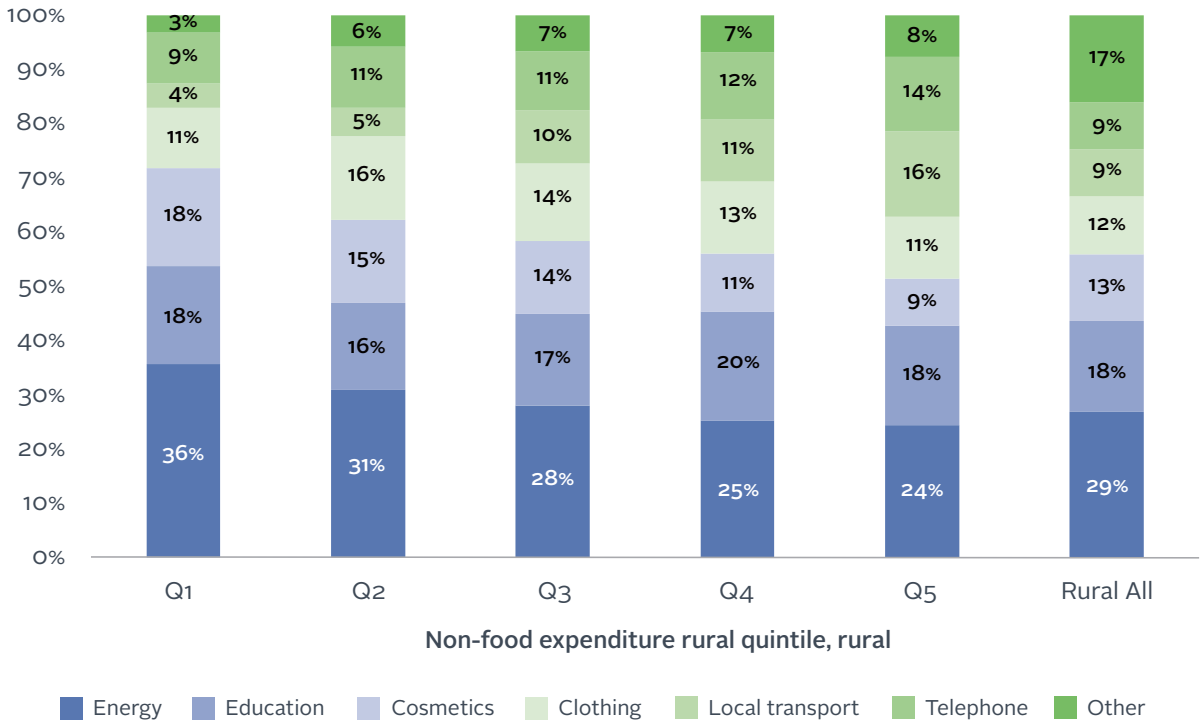
The rise in education spending across the distribution – from 17 percent to 22 percent of the total non-food budget- reflects higher spending in richer urban households compared to more limited spending in rural areas. The rise in education spending is particularly pronounced in urban areas, where it rises from 16 percent of non-food expenditures for the bottom quintile to 27 percent for the top quintile. Among richer urban households, education expenditures are the largest single category of non-food expenditures. Conversely, among rural households the share of total non-food expenditures spent on education remains fairly stable, between 16 and 20 percent, across the distribution although it does rise in absolute terms.

Figure 3.5

Non-food expenditure composition







3.1.3 Durables

Households purchase a variety of durable goods such as household appliances, televisions, radios, motor bikes, cars, etc. These goods contribute to a household's welfare, but last longer than the time horizon over which consumption is typically measured. Most households are unlikely to make such purchases within the reference period of the survey because these items are not depleted within a one-year period, but typically offer a flow of services to households over several years. For this reason, the purchase expenditures for durable goods cannot directly be added to the consumption aggregate. Instead, the appropriate measure of consumption for such durable goods is the value of services or "user cost" that households receive from such assets.

Their contribution to measured consumption should include the amount of the good that is used or consumed within the year. This is measured as the change in value of the asset during the year plus the cost of allocating money to the asset over the course of the year. For a broad range of household assets, the MPLCS collects information on the age of assets owned, the original purchase price, the current (remaining) value at which the household could sell the asset at the time of the survey, and the hypothetical price for purchasing a new model of the same item at the time of the survey. If a household owns several assets of the same type, the MPLCS records the number of functioning items owned (including ones rented to other households) and collects the aforementioned information for the most valuable item. Based on the information in the MPLCS it is possible to estimate depreciation rates, which are then used to calculate a monthly or annual stream of services.

Estimating durable goods user cost is challenging in Myanmar. The 2004/05 IHLCA-I survey recorded information on durables in an approach similar to the MPLCS and found several estimated depreciation rates to be positive, partly attributing this to import restrictions that were in place at the time the survey was fielded. More generally, large and rapid price changes and rapidly changing market conditions over the past years, combined with exceptionally long usage durations and a large heterogeneity of goods, makes it difficult to accurately estimate depreciation rates that can serve as the basis for a user cost calculation.

Despite the challenges in measuring durable use values, the benefit of having a more comprehensive and inclusive basket of items is likely to outweigh the cost of the added measurement error. Empirical evidence from other contexts suggests that excluding any valuation of consumer durables from the consumption aggregate can lead to a bias in poverty estimates, which in turn could lead to misleading policy conclusions. In an environment of economic opening with more widespread access to global markets and high rates of overall economic growth, consumer durable ownership can expand considerably. This expanded ownership can be a key driver of improvements in household welfare. If durable goods are excluded from the consumption aggregate, we may find poverty estimates to appear relatively stagnant while household welfare has in fact increased.

There is evidence from the successive household surveys in Myanmar that durables are likely to be a growth component of consumption. The income elasticity of durables is high in Myanmar. As incomes grow, the inclusion of durables is likely to be important for capturing changes in welfare and poverty over time. Comparisons of durable holdings in the IHLCA-II (2009/10), Population and Housing Census (2014) and MPLCS (2015) also suggest that the exclusion of durables would miss an important component of changing welfare over time.

Estimating use value

We estimate depreciation rates using information collected in the MPLCS data, following the approach presented in Deaton and Zaidi (2002) and most commonly applied in living standards measurement surveys.[8] In a first step, we estimate depreciation rates for each type of good. In a second step, we use these depreciation rates, together with a real interest rate, to determine user cost as the proportion of the current value of each good owned by the household. In cases where households report having access to several goods of the same type, we calculate a user cost estimate for the item with the highest value and multiply it by the number of items owned.[9]

For each good and household, we use the age of the durable good in years T, the current value of the good, P_t, and the value of the good at the time of purchase, $P_{t\text{-}T}$, and the rate of inflation for the relevant period between t and T, Π_t, to calculate the good-specific depreciation rate δ as follows:

$$\delta = 1 - \left(\frac{P_t}{P_{t-T}}\right)^{\frac{1}{T}} + \Pi_{t,T}$$

To minimize the influence of extreme values and measurement error, we take the median across all households that report owning a specific asset to determine a good-specific depreciation rate.

Since the ratio of the real current value and real value at purchase, $\left(\frac{P_t}{P_{t-T}}\right)$, is likely to include a scarcity value as well as the depletion of the good over time, we use an alternative measure of the real value of the good when purchased, $P_{t\text{-}T}$. We notably instead use the reported value of the good if purchased new today and compare the price of the new good to that when it is T years old to estimate depreciation rates.

8 We closely follow the notation of Deaton and Zaidi (2002). To simplify notation, we omit household and item subscripts.
9 This assumes that the value of services that households receive from each item of the same type is the same as the value received from the most valuable item. While this assumption may not always hold in reality, we find that in the absence of detailed data on each item this approach of establishing a reliable welfare ranking is preferable to omitting multiple items.

Descriptive Analysis

Durable use values rise sharply across the expenditure distribution, consistent with the high elasticity of these goods with respect to per capita expenditure. The share of durables use value varies substantially across the distribution, with transportation and communications as the greatest area of absolute growth (Figure 3.6). The growth of communications is likely linked to the expansion of the mobile phone network, which was on-going at the time of conducting the survey. In early 2015, urban areas had denser and greater coverage than rural areas, and easier-to-reach and, often, better-off parts of the country were more likely to have been covered earlier. Figure 3.7 shows durables ownership by expenditure quintile. The ownership and value of vehicle expands as you move up the distribution. Forty-two percent of poorer households report owning a vehicle compared to 71 percent of richer households. Poor households own bikes and motorbikes with equal shares, while richer households are more likely to own motorbikes over bikes. Cars are only owned by the richest households, among whom 17 percent own a car. Car ownership is dominated by urban dwellers—32 percent of the top quintile of urban households report owning a car, compared to 4 percent of the top quintile of rural households. In contrast, motorbike ownership is common in both rural and urban richer households.

Figure 3.6

Durables composition across durables use value distribution

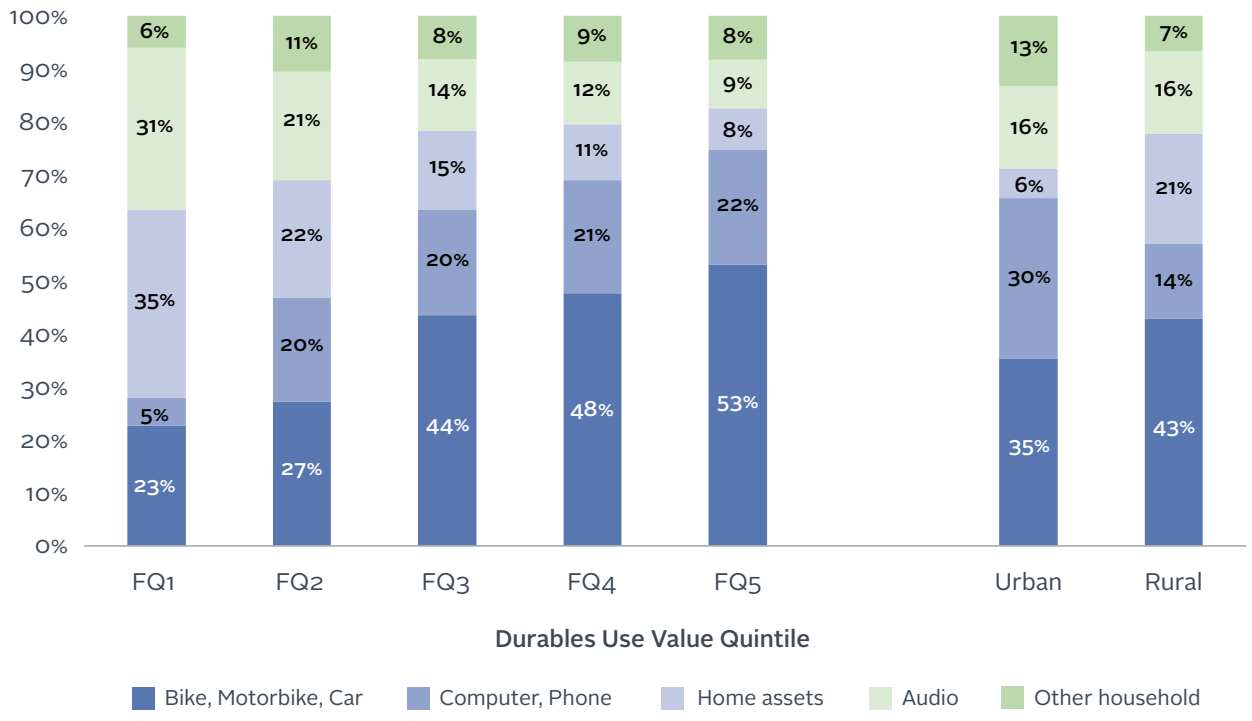
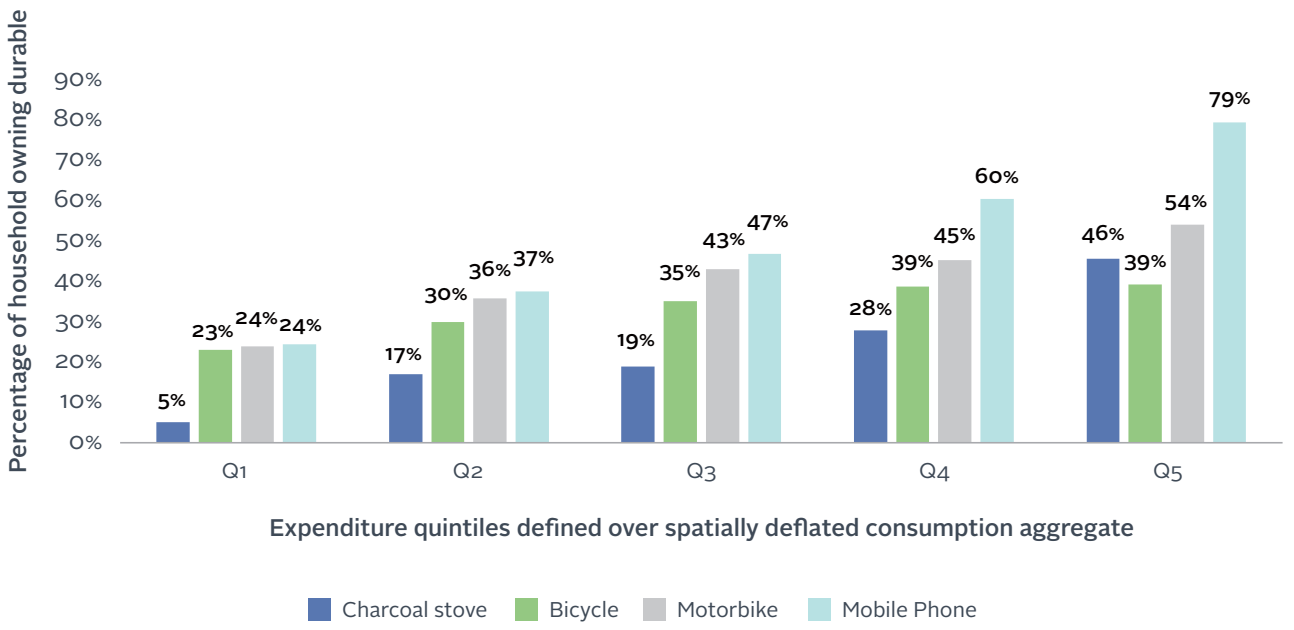


Figure 3.7

Durables ownership across per adult equivalent expenditure distribution



Note: Analysis conducted using household weights. Quintiles are estimated using spatially deflated per adult equivalent expenditures in January 2015 prices and using population weights.

3.1.4 Housing

As with constructing the sub-aggregate for durable consumer goods, the challenge in constructing a housing sub-aggregate lies in measuring in monetary terms the flow of services that the household receives from occupying its dwelling.

In an environment with complete rental markets for housing and where all households rent their dwellings, rent reported by households is the first-best measure of household welfare. In Myanmar, however, only very few households rent their dwelling. In the MPLCS, only 6.9 percent of all households and less than 1 percent of households in rural areas report actual rents. This makes it challenging to reliably use imputation-based approaches and estimate a hedonic pricing model for rents of the non-reporting majority of households.

We have addressed these challenges in various ways, described in greater detail in Meyer (2015). Housing use values are typically estimated using a standard ordinary least squares (OLS) approach. Given that the literature finds that the use of the wrong retransformation method or no transformation method at all can lead to appreciable biases in estimation, we explore alternative methods. One such alternative is the use of a generalized linear model (GLM), which is a class of models that allows for more flexible error distributions than classical least squares. An alternative approach that was explored is multiple imputation (MI), a flexible technique that offers an alternative to dealing with missing data. Originally developed by Rubin (1976) to address survey-non-response, it has become more widely used in a variety of applications (Rubin 1987, 1996). In MI approaches, missing values are replaced with a (relatively small) number of simulated alternatives.[10]

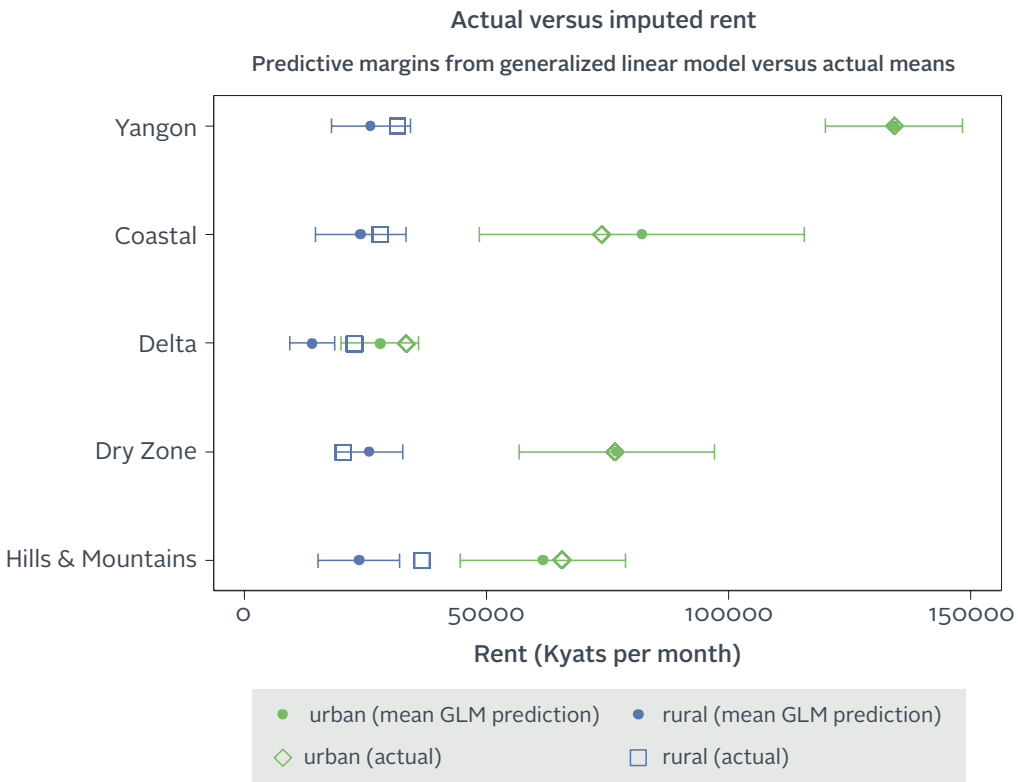
10 See Schafer (1997) for an introduction.

Our preferred approach is to use a generalized least squares model with log links. This approach was selected for its flexibility in modeling heteroscedasticity, for its transparency and replicability and for its improvement in accuracy over OLS. An added and key advantage of using GLM with log links is that we can skip any retransformations.[11]

We use actual and hypothetical rent for observations that are not exceeding the largest actual rent in the sample. Assuming a normal (Gaussian) distribution of the dependent variables, we estimate a GLM using maximum likelihood and with the following independent variables: state/region, stratum (rural/urban), log number of rooms, type of dwelling, construction material of floor, type of toilet facility, source of electricity, and main fuel used for cooking. Figure 3.8 plots predicted rents using the GLM versus actual mean rents by stratum and by agro-ecological zone. Predictions from GLM are shown with a 95 percent confidence interval using heteroscedasticity-robust standard errors. As can be seen, the reported rental values lie, with two exceptions, in the confidence intervals of the predicted rents. In rural areas, the model tends to predict lower values than are reported while in urban areas there is no clear pattern.

Figure 3.8

Actual versus imputed rent from generalized linear model



11 We do however note that there are substantial trade-offs in choosing various estimators, and in particular that GLM can yield imprecise estimates if the log-scale error is heavy-tailed (Manning and Mullahy, 2001).

3.1.5 Household size and composition adjustment

To estimate the share of the population of Myanmar that is poor, we need to capture individual welfare. However, consumption is measured at the household level since it is not possible to accurately measure individual consumption. To move from household welfare to individual welfare, we need to adjust household expenditure by a measure that captures the number of people in the household and to then assign a measure of welfare to each household member as an individual.

A straightforward method to convert household consumption to individual consumption is to divide household expenditures by the number of people in the household. While per capita measures are the most common metric used, they must be treated with some caution as they do not take into account two possibilities:

1) First, individuals have different needs. A baby typically needs less food than a teenager and a working-age adult more than a pensioner. A manual laborer requires more food than an identically-aged office worker.

2) Second, there are economies of scale in consumption. Some goods and services consumed by a household have public good characteristics, whereby consumption by one member of the household does not necessarily diminish the amount available for other members. An example of a service with such a characteristic is lighting. Housing and durable goods are also important goods with public good elements—it costs less to house a couple than to house two individuals separately. Additionally, even though food is generally a private good there may be economies of scale due to bulk purchasing in larger households.

The use of an equivalency scale that accounts for differences in the composition of household is likely to have important implications on the relative poverty of different groups. It should not however alter the level of poverty (Ravallion, 2015). For example, if we use equivalence scales that attribute low needs to children relative to adults, or that incorporate large economies of scale, we will find that there are relatively few children in poverty, but a relatively large number of the elderly. This is because the elderly often live in households that are relatively small and contain few children, while children, who never live by themselves, live in households with children.

We focus on adult equivalent expenditure, using the Government of Myanmar's nutritional norms as the base for the scale. We assume that caloric needs vary across the population according to age, but that non-food needs are the same for all age groups. In making this choice, we have examined how the poverty profile responds to different adult equivalence scales and made an assessment based on both robustness and knowledge of well-being in Myanmar from other sources (for example, qualitative studies such as LIFT 2015).

The adult equivalence parameters were based on the Ministry of Health's estimates of dietary needs for various age groups, tabulated in Annex A2. We simplify the dietary needs in two ways. First, we assume that the needs of boys and girls, and men and women are the same. Since the Ministry of Health assumes higher calorie needs for men than for women, we take the average of these needs to reach an average calorie need for a particular age group. Second, since we are unable to identify pregnant or breastfeeding women, we are unable to accommodate differences in needs for this group. The adult equivalence parameters are a weighted average of food needs that vary by age, and non-food needs that do not. Since food accounts for an average of 70 percent of total expenditures, we use a food weight of 0.7 and a non-food weight of 0.3.

A vital additional issue to note in the application of adult equivalence scales is the need to normalize the poverty line. We apply the two step process recommended in Deaton and Zaidi (2002) and Ravallion (2015) in the application of adult equivalence scales: (i) we choose an equivalence parameter to represent the needs of different demographics in the population; and (ii) we normalize to adjust the poverty line after adjustment.

Using this two-step approach, differences in adult equivalence scales do not affect the level of poverty but instead impact the profile. In the absence of normalization, however, estimated poverty declines with the application of an equivalence scale. (Ravallion, 2015). This is an important difference between the new methodology and the methodology used in MNPED et al. (2007), with non-trivial implications for measured poverty.

3.1.6 Spatial and temporal price deflation

Spatial price differences are likely to be substantial in Myanmar, where transportation costs and times can be substantial. To make comparisons in the welfare of households living in different locations, it is necessary to account for these variations in prices by constructing price indices that account for these differences. Two price indices that are commonly used to capture spatial price variation are the Paasche and Laspeyres price index. A geometric average of the two indices (Fisher index, Törnqvist index) may also be used, which may come closer to the true cost of living. To make these indexes more relevant to the poor, they can be restricted to a poor reference group (Deaton and Zaidi, 2002).

Another approach is to derive the spatial price index from regional poverty lines (Gibson, 2007). There are two potential advantages to this approach. In comparison to the indices mentioned above, prices are not required for all products, as poverty lines can be calculated when certain product prices are missing in an area. Second, it means that the products included in the price index reflect those included in the poverty basket. However, this approach may not keep utility constant across areas.

We spatially price using Laspeyres welfare-ratio index, where the weights in the index are budget shares at the poverty line. The Layspeyres index calculates the relative price in each region for the base regions basket. As the basket is fixed, the index does not allow for households to substitute expensive products, and therefore overstates the cost of living in high-price areas.

$$L = \frac{\sum_{j=1}^{J} Q_{kj} * P_{ij}}{\sum_{j=1}^{J} Q_{kj} * P_{kj}}$$

Note: k is the base region, i any other region, and j are different items of the basket. Q are quantities, P are prices.

Median prices are estimated at the agro-ecological zone level, and then normalized to leave average expenditures unchanged. The spatial price deflator includes food items, housing and non-food expenditure items. The price of non-food items is not captured in the MPLCS. The non-food component of the spatial price deflator therefore relies on prices gathered for the Consumer Price Index.

Since the survey was conducted between January and April 2015, we need to normalize expenditures to account for inflation over the course of the survey. We normalize all values to January 2015, and use the Consumer Price Index from the Central Statistical Organization of Myanmar to do this.

3.1.7 The consumption aggregate and its components

Figure 3.9 shows the level of total consumption expenditures separated into spending on food, non-food expenditures, education, housing and durables use value. Figure 3.10 shows the share of total consumption devoted to rice, food, durables and non-food expenditures (including education). Median total consumption expenditures in Myanmar are 1644 kyat per adult equivalent per day in January 2015 prices, or approximately US$1.60 (at 1025K=US$1 on January 1st 2015). Median expenditures in urban areas are 60 percent higher those in rural areas, at 2362 kyat per adult equivalent per day compared to 1491 in rural areas. Mean expenditures show differences of similar magnitudes: 3163 kyats per adult equivalent per day in urban areas compared to 1707 kyats in rural areas.

As real household incomes grow, there is typically a change in the composition of the household budget: a decrease in the share of expenditures going to food items and an increase in the share going to non-food items. Myanmar follows this expected pattern. Food accounts for over half of consumption expenditures for the bottom 80 percent of households. Households in the bottom 20 percent devote 66 percent of the total expenditures to food. In the top quintile, the share of food drops to 46 percent but remains the largest single component of total consumption. The share of spending devoted to non-food expenditures, excluding spending on education, rises moderately across the distribution from 18 percent for the second quintile to 19 percent for the fourth quintile.

Figure 3.9

Total Consumption per adult equivalent by components (spatially deflated)

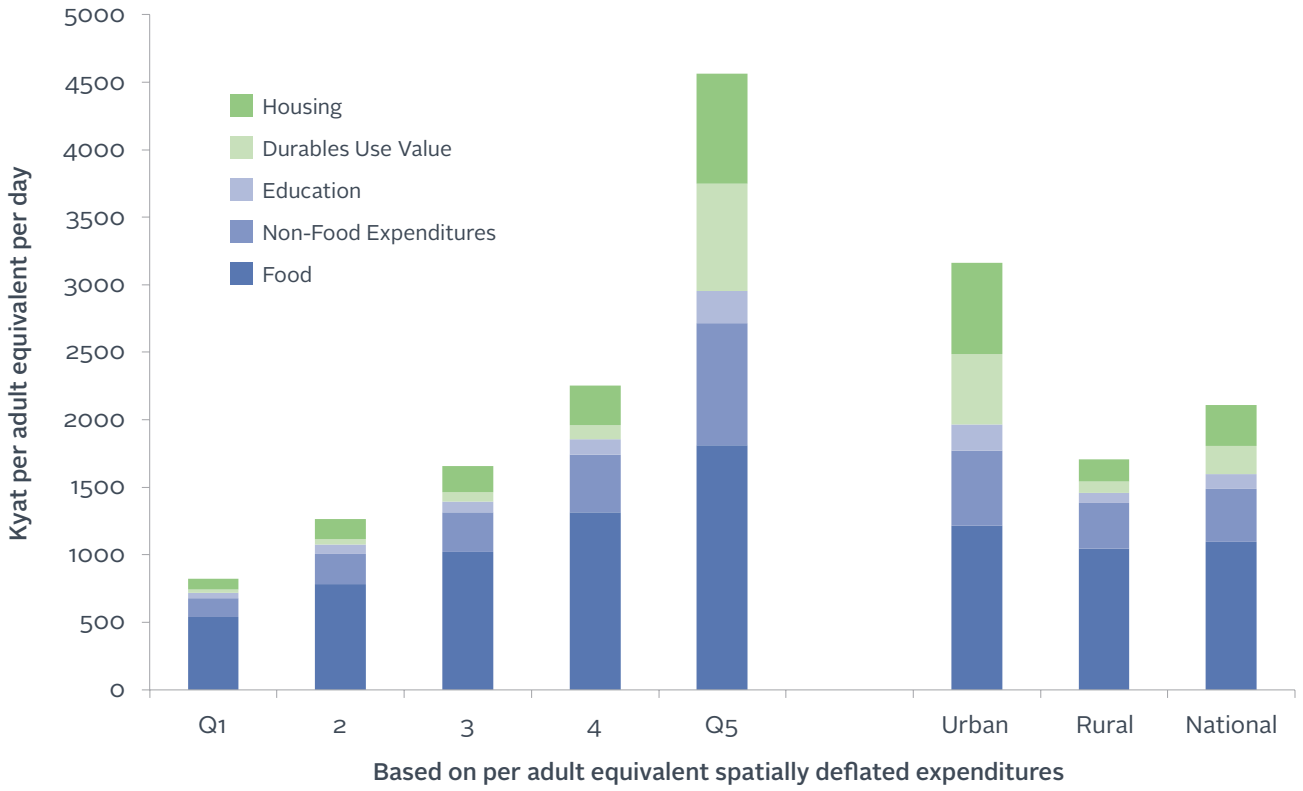
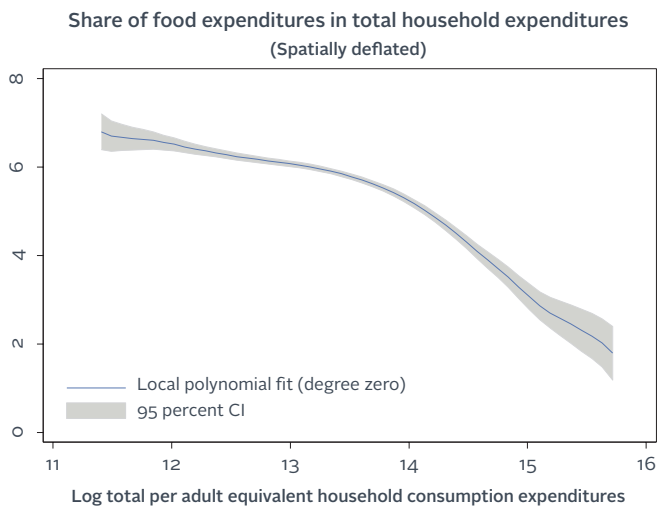
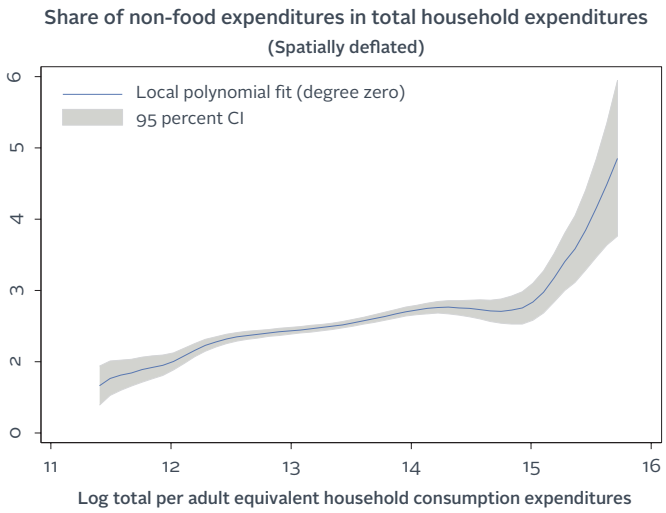
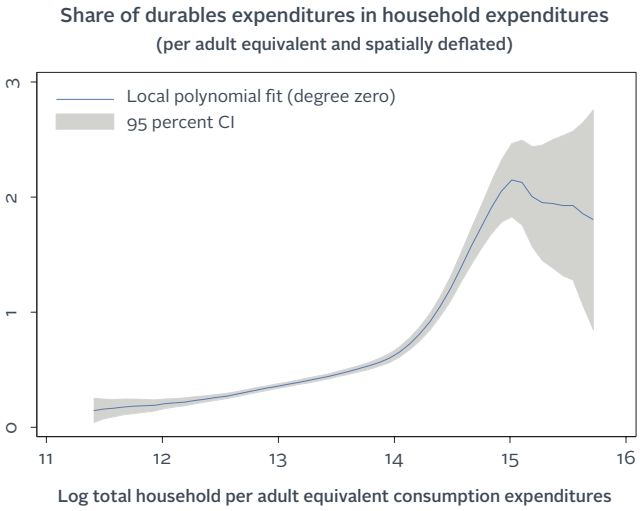


Figure 3.10

Share of food, non-food and durables expenditures in total consumption







3.2 Step 2: Definition of the New Poverty Line

A poverty line is a threshold for assessing whether an individual achieves a basic minimum level of well-being. The poverty line consists of two components—the food poverty line and a non-food allowance that captures basic non-food needs. The process of defining a poverty line can be summarized by two related questions:[12]

i. What is the minimum level of well-being at which an individual is not considered poor?

ii. How can we identify the minimum amount of money corresponding to that level of well-being?

An absolute poverty line is "fixed in terms of the standards indicator used, and fixed over the entire domain of the poverty comparison" (Ravallion 1992, p 25). In other words, the poverty line is set so that it represents the same purchasing power over time.

The cost of basic needs (CBN) approach is the standard approach to address these questions. The CBN approach first stipulates a consumption bundle that is deemed adequate for basic consumption needs and then estimates the cost of this specific bundle. The bundle captures two sets of basic capabilities: obtaining sufficient nourishment to maintain an individual's health and sufficient access to non-food goods that are necessary for full participation in the society in which he or she lives. To estimate the poverty line using the CBN approach, we follow these steps:

1) Identify a nutritional requirement for good health, basing the requirement on calories per person per day.

2) Estimate the cost of meeting the food energy requirement by using a diet that reflects the choices of households whose income and expenditure places them in the vicinity of the poverty line. This is the food component of the poverty line.

3) Add a non-food component that reflects the additional needs of households to be satisfied to allow for full participation in society.

4) Estimate the total poverty line that includes both the food poverty line and the non-food component.

We iterate on steps 2 to 4 until we get a final poverty line estimate, narrowing the reference group used in the vicinity of the estimated poverty line until we converge upon a final estimate. Note that the basket of the spatial price indicator is also updated in these steps.

This section describes the steps taken in setting the new poverty line.

3.2.1 Nutritional benchmark

We anchor the food poverty line to a caloric intake of 2238 calories per person per day. The benchmark is based on calorie recommendations from the Ministry of Health and Sports (n.d.) applied to the age and sex profile of households in the MPLCS (Table A2.4). As there are many people clustered around the poverty line, poverty in Myanmar is quite sensitive to the choice of nutritional benchmark, as discussed in Section 3.4.5.

12 This paragraph is adapted from World Bank (2015).

3.2.2 Estimating the food poverty line

To estimate the food poverty line, we estimate the calories consumed by households and subsequently estimate the level of per capita expenditure at which the basic nutritional needs are met.

Calories

We first convert household food consumption into kilocalories. Our approach to setting calories deviates from that of previous poverty measures in Myanmar.

Quantified goods

We use the same calorie table as previous poverty estimates (found in MNPED et al 2011). This calorie table provides information on edible portions—the component of the food product that is eaten, for example the flesh of the banana without the peel. While this is the correct metric for a range of items, such as rice, pulses and fish sauce, it may overestimate the calories consumed from other sources of food such as meat, fish, vegetables and fruits that typically include a component of bones, refuse, shell or inedible peel. For these items, we apply wastage factors. Where available, we use those provided by the Ministry of Health and Sports (n.d.). Where not available we use the calories of items "as purchased" from the FAO (n.d.), which provides calories for items including any refuse in the weight. Finally, for items also not included in this list, we use information on wastage factors from the FAO 1972 list on food composition in South East Asia (FAO 1972), applied to the calories provided in MNPED (2011).

For verifying our estimates, we compared values from all three sources, and, in a few cases, made case-by-case replacements. A list of calories per item, source of information and reason for changes can be found in Table A2.2.

"Other" categories

For each food item category, the survey instrument allows for an "other" category item—for example, "other cereals or grains". These account for 5 percent of total consumption expenditures. Table A2.3 shows "other" food item categories, data source for caloric content of the food item, and number of cases in which information is provided for such categories in the MPLCS data. Calorie content for these items were sourced from the calories tables used in previous poverty analysis (MNPED et al, 2007) and from FAO (2015). The estimation of caloric contents for remaining "other categories" is based on country-specific information of the FAO (n.d.).

Food away from home and prepared food

The MPLCS asks respondents if they have eaten any meals away from home and, if so, the type of meal and the value of the meal both in cash and in kind. We use the caloric intake per kyat for all items consumed at home from that household to estimate a caloric intake for these meals; the assumption here is that the foods consumed outside the home are similar to those consumed inside the home. For prepared food eaten at home we apply the same methodology.[13]

13 An alternative approach that was tried was to use data on food consumed outside the home in the IHLCA-II, which asked respondents to report consumption of a detailed list of items eaten away from home. We identified meals from the IHLCA-II list that are usually eaten for breakfast, lunch, dinner and as a snack. We then estimated average calories per kyat for each of the foods that fall into these meal categories, weighted by the share of expenditures devoted to different items. This value was inflated to 2015 prices using temporal price deflators per agro-ecological zone, retrieved using population-weighted averages of state/region-level Consumer Price Index. The average calories per kyat from this method were substantially lower than those eaten at home, likely a reflection of the fairly limited items included in the IHLCA (e.g. there were no rice based dishes, even though rice constitutes the majority of calories consumed within the house).

Descriptive Analysis

The low food expenditures in the bottom quintile in Myanmar is mirrored in calorie consumption. Within households in the bottom quintile of total expenditures, individuals consume an average of 1959 calories per adult equivalent per day, compared to an average of 2463 nationally (Figure 3.11). The median in the nation, 2388 calories are consumed per adult equivalent per day. The lowest calorie consumption occurs in the Hills and Mountains, where individuals consume an average of 2255 calories a day. Approximately 41 percent of households consume less than 2238 calories per adult equivalent per day. Calorie consumption in urban areas is lower than that in rural areas, but expenditures are higher in urban areas. The difference between calorie consumption in rural and urban areas reflects multiple factors, including higher physical activity levels in rural areas linked to manual labor.

Figure 3.11

Calories per adult equivalent

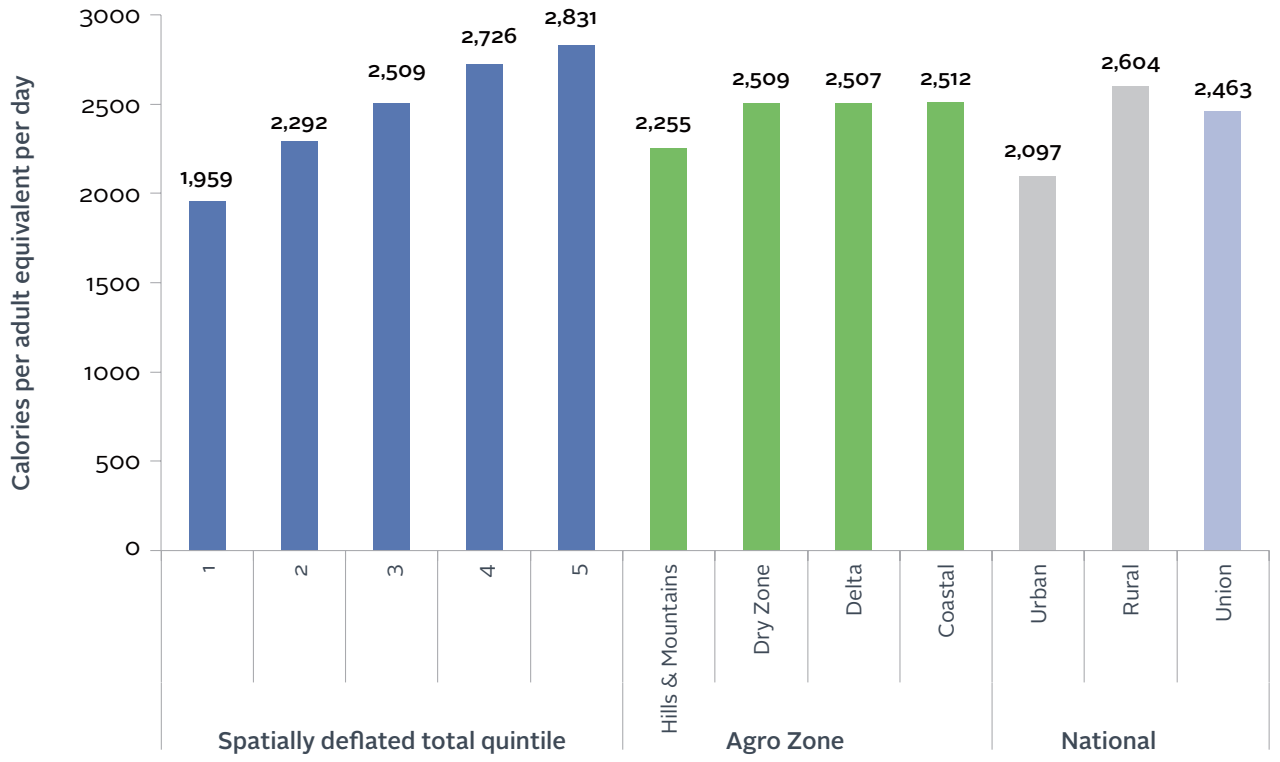


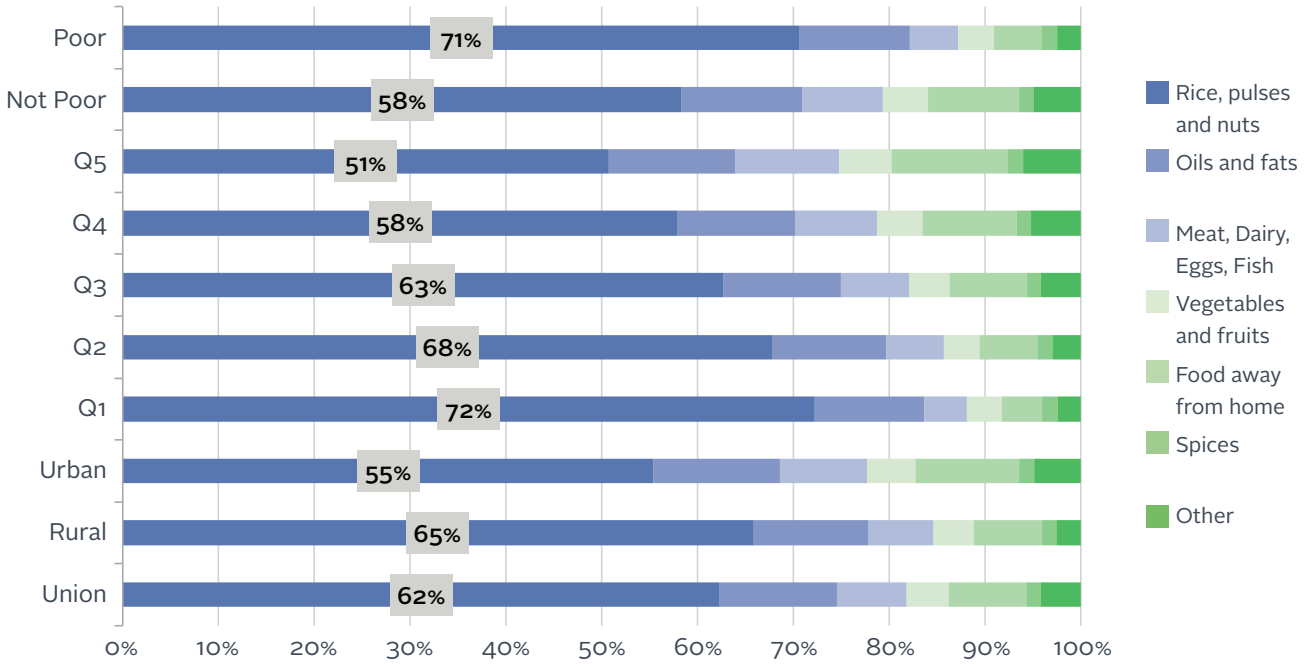
Figure 3.12 shows the share of calories from various food groups. Although average per capita calorie consumption in urban areas is lower than in rural areas, the calorie composition of urban areas reflects a richer basket that includes a greater share of calories coming from more nutrient-rich meat, dairy, eggs, fish, vegetables and oils. Rural residents consume 65 percent of their calories from rice, compared to 55 percent among urban residents.

The bottom quintile consumes 72 percent of calories from rice and only 5 percent of calories from protein, fat, calcium and amino-acid rich meat, eggs, dairy and fish. There is a stark and clear gradient in the share of calories sourced from rice compared to meat and other proteins. The share of calories from rice drops monotonically across quintiles, while the share of meat and others rises from 5 percent of calorie consumption to 11 percent. The share of calories from oil and fats remains constant across the expenditure distribution, at approximately 11 to 13 percent of total calories.

In urban areas, higher food expenditure per capita and adult equivalent and lower calorie consumption of reflects a slightly greater share of calories coming from food away from home and from protein-intensive foods. Drawing from the experience of neighboring countries, the share of expenditures and calories coming from food away from home will continue to rise as Myanmar's population prospers. It is therefore vital in further work on poverty in Myanmar to understand better items consumed from food away from home.

Figure 3.12

Share of calories from different food groups



Reference basket and food poverty line

We calculate a consumption basket in quantities and calories per item. As consumption patterns and the cost of calories vary with welfare, we use a reference group close to the poverty line. In our first iteration, we use the second quartile of the welfare distribution. We estimate mean quantities consumed by the median household in the reference group. For food away from home, we calculate calories only, as quantities are not available. We iterate on this basket until the poverty estimate converges, defined using a 3 decimal point gap between estimates. The consumption basket is priced using the mean price of the item by strata (agro-ecological zone). Food away from home is priced with median kyat per calorie, by strata. The food basket is scaled up or down to the quantities needed to consume 2238 calories per capita with the same food composition. The food poverty line captures the expenditures needed to meet the minimum caloric needs based on the reference basket of the poor.

3.2.3 Non-food Allowance

In contrast to the absolute benchmark of calories used to set the food poverty line, there is no readily available absolute benchmark for setting non-food poverty lines. Following the cost of basic needs method, we estimate the non-food allowance for the subset of households whose per capita expenditure is relatively close to the poverty line.

We follow the approach of Ravallion (1998) in examining what people close to the poverty line consume in terms of non-food. This approach estimates an upper and lower bound, and an average poverty line:

> **A lower bound of the poverty line** is determined by observing households whose total expenditures equal the food poverty lines. These households displace some of their food consumption with necessary non-food consumption. This non-food consumption can be therefore seen as the minimum basic need of non-food consumption.
>
> **An upper bound of the poverty line** can be defined as the total non-food expenditure of households whose food consumption equals the food poverty line.
>
> **The average poverty line** is calculated as the average of both poverty lines.

There are two approaches to estimating the non-food component of the poverty line: a parametric approach and non-parametric approach (Ravallion, 1994, Ravallion, 2001, Gibson, 2007). We apply the non-parametric approach for estimating lower and upper poverty lines. We verified the consistency of the estimates to the use of the parametric method, which allows for the inclusion of demographic covariates. The estimates are statistically indistinguishable.

3.2.4 Estimation and iteration approach

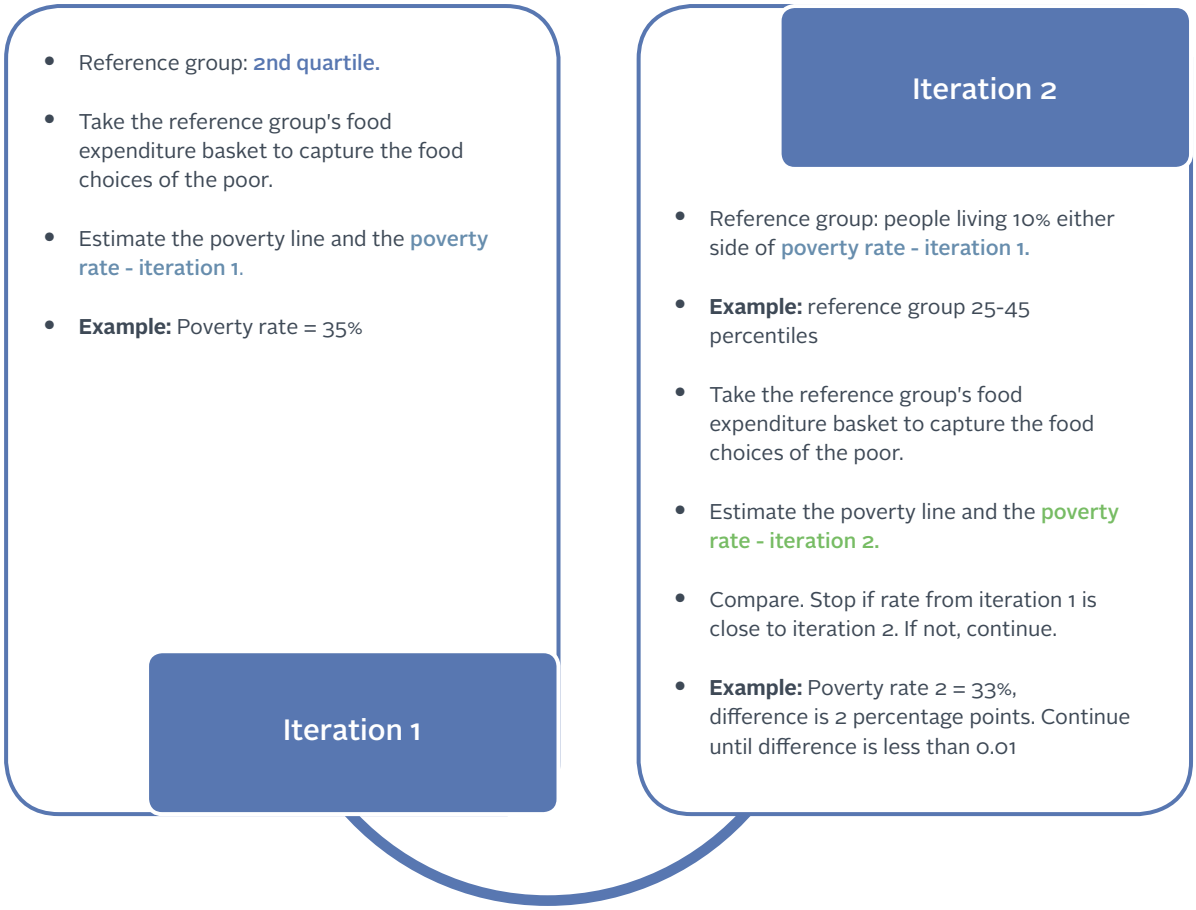
We use an iterative approach to estimating the poverty line and the food poverty line, revising the reference basket used to benchmark the food poverty line until the national poverty rate remains unchanged. The process is illustrated by Figure 3.13 below.

In the first iteration, we start by anchoring food preferences to the basket of foods consumed by households in the second quartile of the food expenditure distribution. We estimate the food poverty line based on the food preferences of this group and then add non-food expenditures using the approach described above. This gives us the poverty line produced from this first iteration. We estimate the fraction of the population who are poor using the first iteration poverty line. We use this estimate of poverty to refine the reference basket of the poor. Instead of using the second quartile to define the reference basket, we take households living in the vicinity of the first iteration poverty line.

In the second iteration, we use the food preferences of households living within 10 percentage points of the first iteration poverty line to define the food preferences upon which we define the second iteration food poverty line and use this to add non-food expenditures, giving the second-iteration poverty line This second iteration poverty line is then used to define the reference food basket of the poor, and so on and forth. We continue to refine the food basket until the difference in the poverty rate between successive iterations is less than 0.01 percentage points.

Figure 3.13

Example of poverty line estimation process



An additional step in the iteration process is to convert the food and consumption aggregate from nominal to real, through spatial deflation. In the first iteration, we use nominal consumption to estimate poverty. During the iterative process we update the basket of the spatial price deflator using the basket of the poor to benchmark the spatial price index. In the second iteration, we use the food poverty basket from the first iteration to spatially deflate the food aggregate and further include non-food price deflators for housing and non-food expendables to spatially deflate the full consumption aggregate. We estimate the expenditures on housing and non-food items among households whose spatially-deflated per capita food expenditure is close to the poverty line. We use a weighted average of expenditures of individuals on either side of the line, where those individuals whose expenditures lie closer to the line are given a greater weight.[14]

14 We include individuals whose food expenditures lie within 10 percent of the line. The individuals for whom food expenditures lie within 0 to 2 percent of the line are given a higher weight than those with expenditures between 8 and 10 percent of the line.

3.3 Step 3: Poverty Estimates

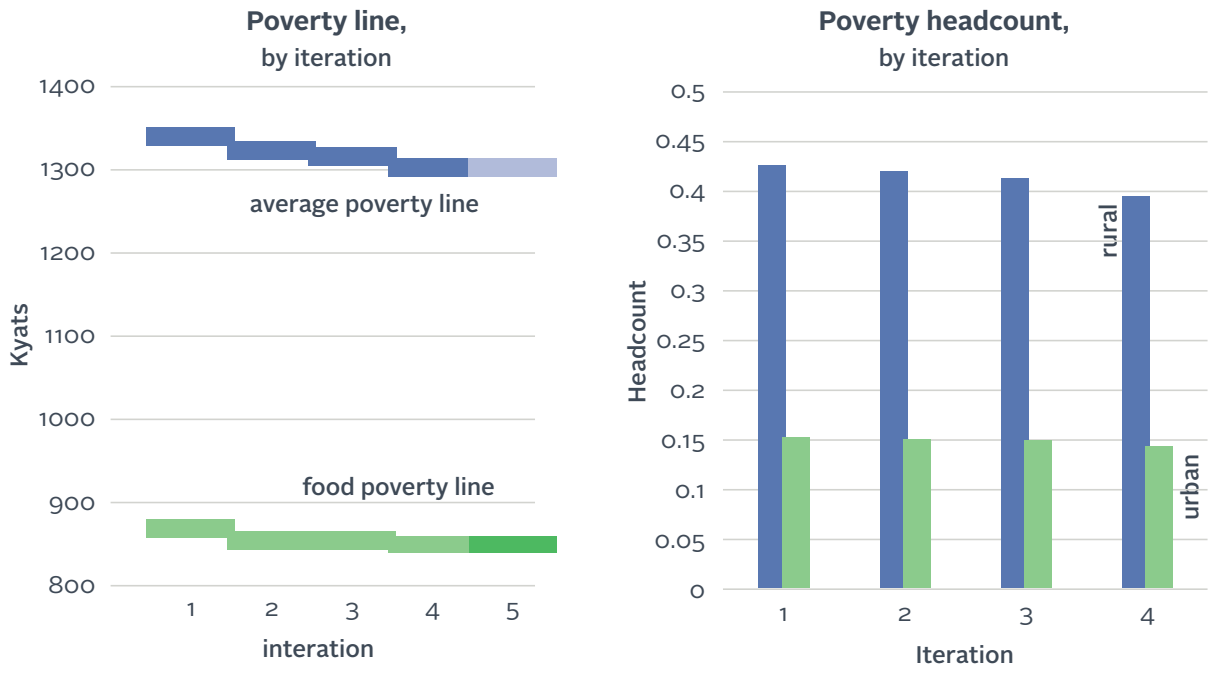
We now turn to the poverty line and estimates. We first examine the poverty line, showing the iterative procedure and discussing the item and calorie content composition of the line. We subsequently turn to the poverty estimates produced.

3.3.1 The poverty line

The poverty line and rate was estimated using an iterative procedure, as described in the preceding section. Convergence was attained after 5 iterations. As can be seen in Figure 3.14, the estimated poverty rate declined over these iterations as the reference basket and spatial price index were adjusted to accommodate the preferences of households around the poverty line.

Figure 3.14

Convergence of poverty line and headcount



3.3.2 Basket of food at the poverty line

The food poverty line is estimated to be 850 kyat per adult equivalent per day using January 2015 prices. The food poverty line only includes the food items needed to attain basic minimum food needs; as such it is lower than the total poverty line. Since earlier poverty estimates in Myanmar used adult equivalence scales without adopting a normalization approach, a direct comparison of food poverty lines is difficult to make.

Our estimates suggest that 9.8 percent, or roughly one in ten individuals in Myanmar, suffers from food poverty. Food poverty is defined as a household having total (food and non-food) expenditures below the food poverty line. This is a form of severe hardship, which captures the basic minimum expenditure needed to meet minimum calorie requirements. Food poverty is predominantly a rural phenomenon: 12.5 percent of the rural population fall into food poverty compared to 2.7 percent of the urban population. Food poverty incidence is estimated to be highest in Coastal areas and the Hills and Mountains, where respectively an estimated 19.1 and 15.9 percent of individuals are estimated to fall into food poverty. Although food poverty

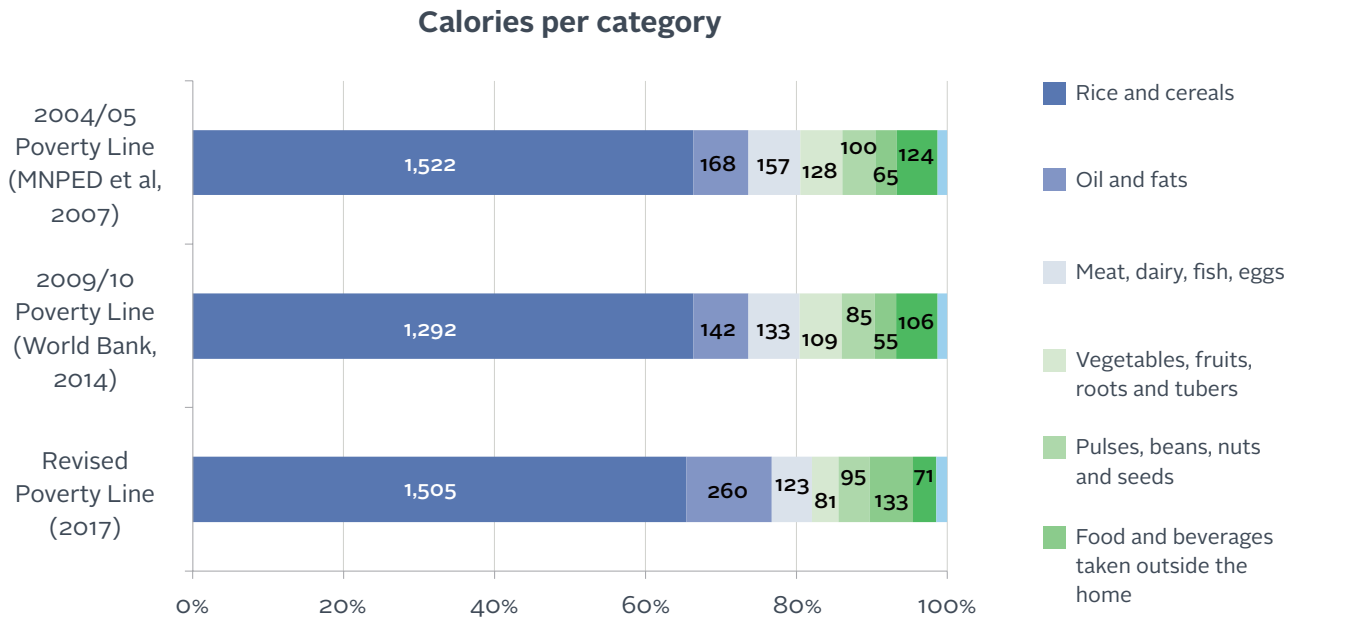
is estimated to be lower in the Delta and Dry Zone, at 6.9 and 7.4 percent respectively, these figures still suggest substantial incidence of deprivation.

While we cannot make direct comparisons of the poverty line over time, we are able to compare the calorie content of the poverty line over time, subject to the caveat that the food items included in the baskets diverged slightly. Both our estimations and those of MNPED (2011) excluded alcohol from the basket of the poor. MNPED (2011) also excluded non-quantified items, such as "other meat" or "other fish", that accounted for 15 percent of calories in the new basket using the 2009/10 IHLCA-II data by World Bank (2014).

The new poverty line presented here includes a greater share of calories from oil and rice than in previous estimates of poverty in Myanmar and a lower share for meats, vegetables and dairy (Figure 3.15). The decline in calories from meat, fish, vegetables and fruits predominantly reflects the application of wastage factors that take into consideration the inedible portion of meat or fruit, as discussed in Section 3.2.2. The new poverty line applies wastage factors to meat, vegetable, fish, egg and fruit products; benchmarks established by the FAO are applied to the calories consumed (FAO, 1972).

Figure 3.15

Reference food basket of poverty measures in Myanmar

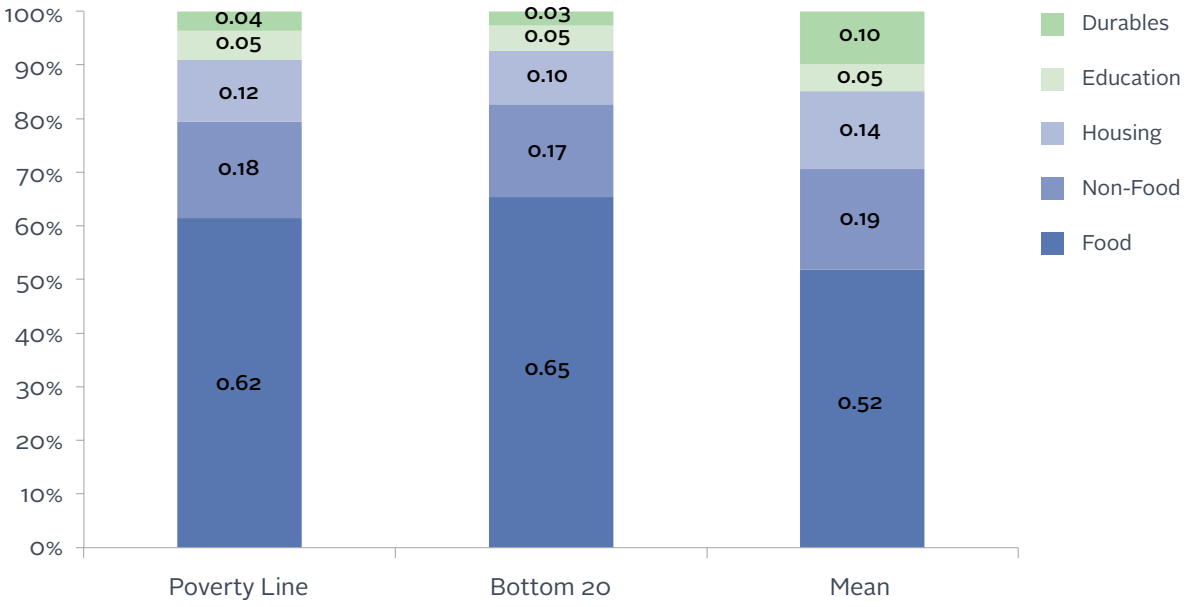


3.3.3 Composition of food and non-food at the poverty line

The basket of goods among those living near the poverty line is dominated by food, with only 38 percent of total consumption expenditures devoted to non-food items. This is shown in Figure 3.16 below. Of these non-food items, the largest share of expenditures goes to non-food expendables which include necessities such as energy, cleaning products and toiletries. The share of total expenditure going to food and non-food items is similar for the bottom quintile and the median household, a finding that reflects the large share of households that are clustered at low levels of expenditures. Engel noted that, as household income grows, food spending rises but less quickly than total income—as a consequence the proportion of expenditure devoted to food declines as households become better off (Engel, 1857; Deaton and Muellbauer, 1980). Although the share of expenditures devoted to food declines slightly between the bottom quintile and the median, the small decline is consistent with high rates of poverty in Myanmar where households prioritize spending on the most basic food needs. Households at the median of the distribution have a more diverse diet that includes more protein than poorer and bottom quintile households.

Figure 3.16

Composition of basket of goods among those near poverty line



3.3.4 Estimated poverty rate, by strata

We present three measures of poverty in Figure 3.17:

1. *Poverty Incidence* captures the percentage of the population who are poor. It does not capture the extent to which they are poor. It is commonly known as the headcount rate of poverty.
2. *Poverty Intensity* is a measure of the depth of poverty. The intensity of poverty is captured using the average shortfall from the poverty line. Known as the poverty gap, it is calculated as the poverty incidence multiplied by the average shortfall among the poor.
3. *Poverty Severity* multiplies the poverty incidence by the square of the average shortfall from the poverty line. This gives more weight to people who are further away from the poverty line, unlike poverty intensity, which equal weight to each kyat that households are away from the poverty line.

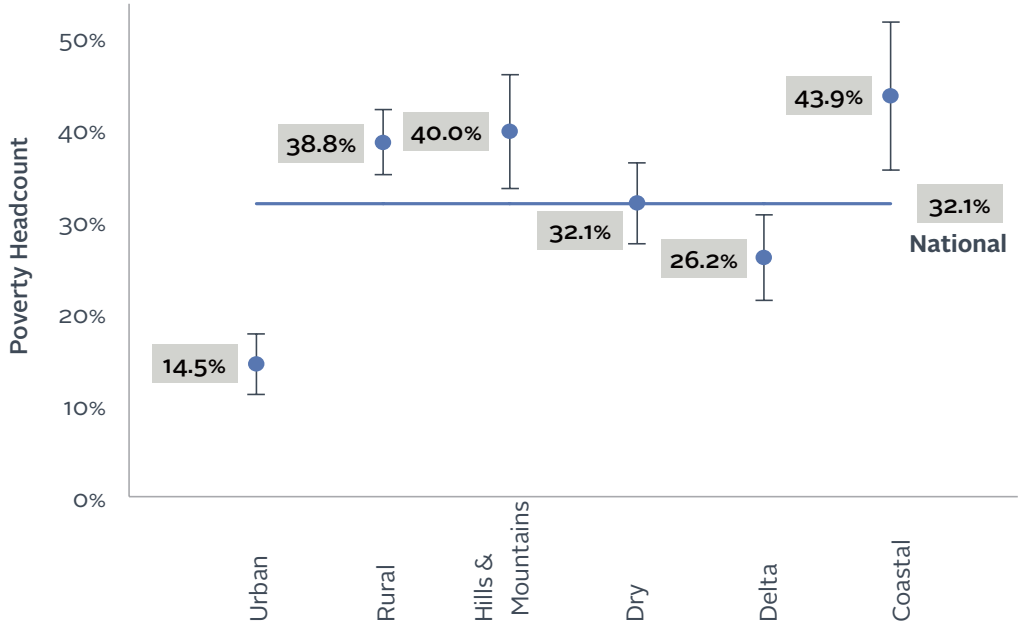
Based on the revision of the poverty line and on the preferred consumption aggregate, we estimate that 32.1 percent of the population of Myanmar was poor in 2015.

Poverty in Myanmar's farms and villages is substantially higher than that in its towns and cities: 38.8 percent of the population in rural areas are estimated to be poor compared to 14.5 percent of those in urban areas. This amounts to 15.8 million poor in total, of which 13.8 million are found in rural areas and 2.0 million are found in urban areas. The estimated number of poor is based on the enumerated and estimated non-enumerated population living in conventional households, following the definition of the Housing and Population Census of Myanmar (Ministry of Immigration and Population, 2014). The poverty estimates therefore do not include the 2.35 million individuals in Myanmar living in student dormitories, monasteries, convents, barracks and other such living arrangements. We are unable to currently estimate state or region level poverty due to the small sample size of the survey. Small area estimates will be estimated through a subsequent poverty mapping exercise.

We are however able to estimate poverty at an agro-ecological zone level and find that there is substantial geographic variation in poverty. The headcount rate of poverty in the Coastal areas is 43.9 percent, nearly double the rate of 26.2 percent in the Delta. The headcount poverty rate in the Hills and Mountains is also substantial, at 40.0 percent. The Coastal and the Hills and Mountains areas have the highest poverty intensity and severity, consistent with the substantial food poverty recorded in these areas. We note that the standard error of poverty estimates in the Coastal areas is considerable, likely reflecting the substantial diversity in these areas. Although poverty in the Coastal areas is estimated to be higher than in the Hills and Mountains areas, due to high standard errors the difference between the two zones is not statistically significant.

Figure 3.17

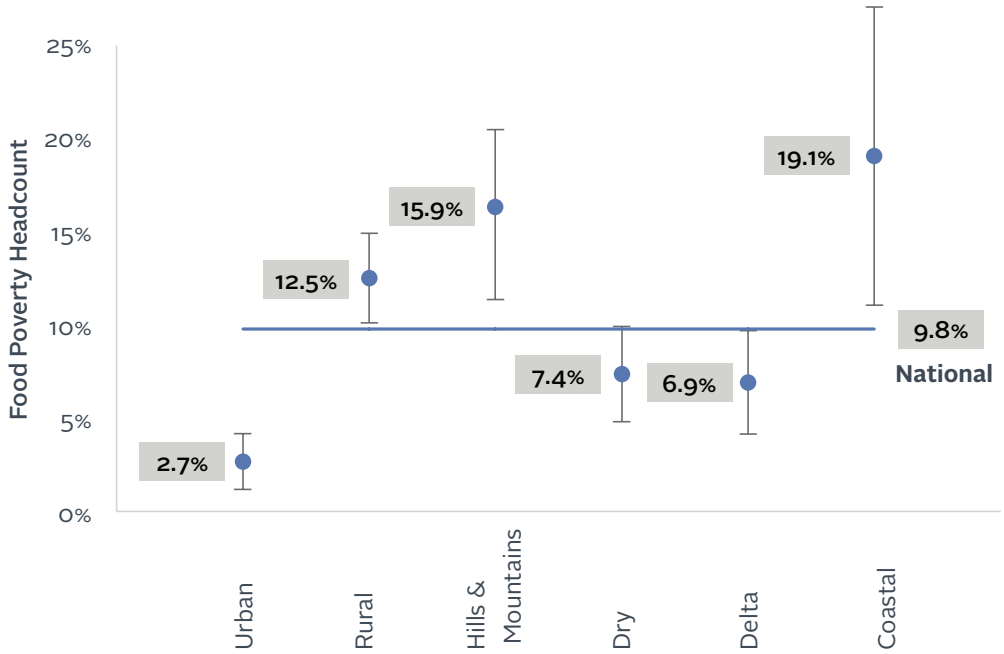
Poverty headcount, poverty incidence and poverty intensity in Myanmar



Ten percent of the population of Myanmar are food poor, meaning that their total consumption expenditures are not considered sufficient to cover their food needs. This measure of poverty captures a form of extreme deprivation, where even the most basic of food needs are not being met. Rates of food poverty are substantially higher in rural areas than in urban, with 12.5 percent of the rural population suffering from food poverty compared to 2.7 percent of the urban population. Food poverty rates are considerably higher in Hills and Mountains and Coastal areas, consistent also with their higher rankings in the poverty gap and poverty severity measures for both food and total poverty.

Figure 3.18

Food poverty headcount, by urban and rural strata and agro-zone



3.4 Step 4: Sensitivity Analysis and Robustness Checks

We estimate the sensitivity of the headcount rate of poverty to variants of the preferred consumption aggregate, and to alternative price formulations for setting the poverty line and to spatially adjusting prices. We find little sensitivity to the assumptions on how to estimate depreciation of durable goods, the inclusion or exclusion of health care and the formulation of the spatial price index. We find substantial sensitivity to the choice of calorie norm, and that the profile of poverty is sensitive to the adult equivalence scale used. Subsequent to the sensitivity analysis, consultation and analysis was conducted around the choice of calorie norm and the equivalence scale to be used in order to ensure that the profile appropriately represents the nature of poverty in Myanmar.

3.4.1 Inclusion of durables

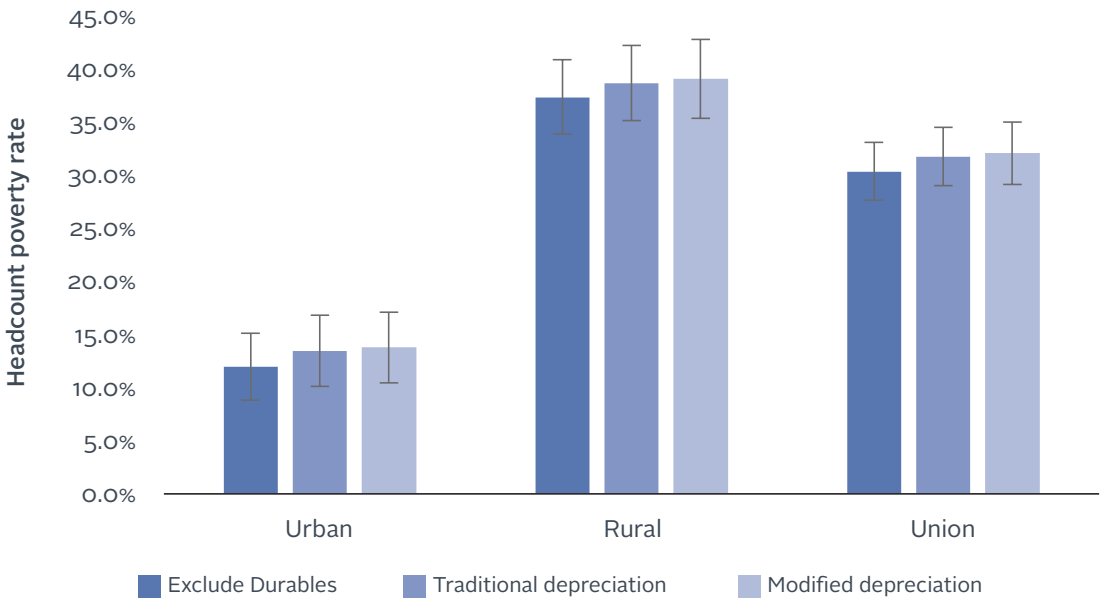
We examine the sensitivity of the poverty estimates to the inclusion of durables, and to the method of producing depreciation rates discussed in Section 3.3. We present three scenarios in Figure 3.19 below. In scenario 1, we remove durables use value from the consumption aggregate. In scenario 2, we estimate depreciation rates using the traditional approach of using the reported purchase value at time of purchase. In scenario 3, we estimate depreciation rates using the preferred depreciation method, using perceived purchase value if purchased at the date of interview.

The poverty line is responsive to changes in the approach to estimating durables, but not overly sensitive. This is unsurprising given the small share of durables accounted for by individuals living near the poverty line. Durables account for 3 percent of consumption expenditures among those in the bottom 20 percent. Very little difference is seen in the use of the two depreciation methods on poverty estimates. The headcount rate of poverty remains the same at the national level, and there is a very small change in poverty rates at the urban and rural level. There is, however, a slightly larger impact on poverty estimates from removing durables from the consumption aggregate. In this scenario, poverty estimates rise by approximately 1

percentage point. Although the limited sensitivity of poverty estimates to durables is intuitive given their relatively small importance in the expenditure aggregate for poorer households, the inclusion of durables is likely to have important implications for poverty trends and future poverty estimates. Durables typically have a high elasticity to expenditures, and are an important area for welfare growth as has been seen in the recent past across neighboring countries including India and Vietnam (Basole and Basu, 2015; World Bank 2012).

Figure 3.19

Sensitivity of poverty estimates to durables aggregate used

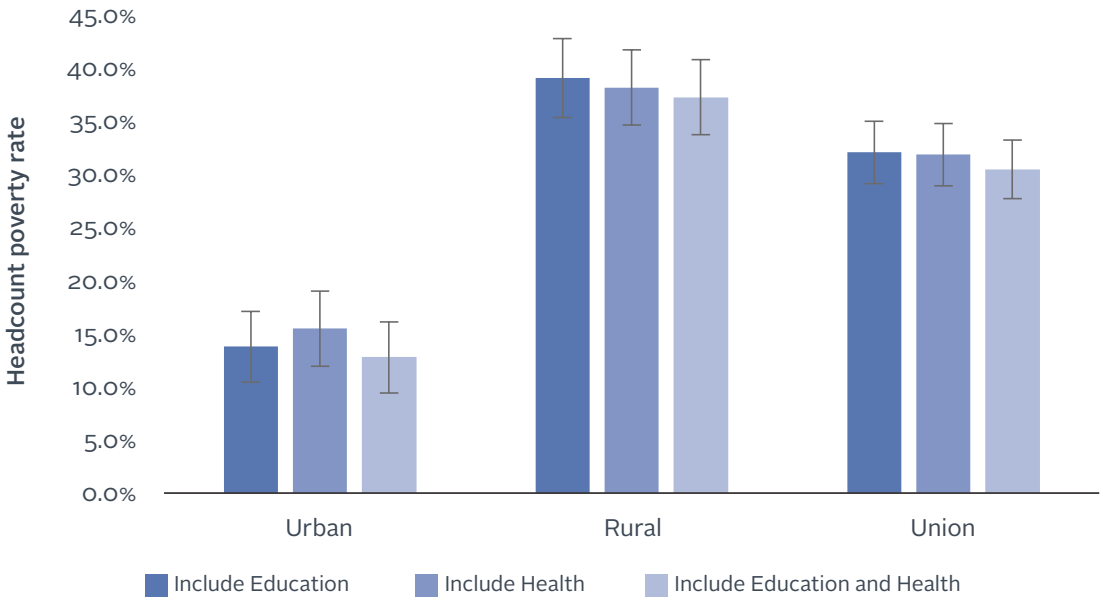


3.4.2 Inclusion of health expenditures

As discussed in Section 3.1.2, it was decided to omit health care expenditures from our measure of the consumption aggregate. We find in our sensitivity analysis that including health expenditures raises the poverty line from 1310 kyat per adult equivalent per day in January 2015 prices to 1325 kyat. This translates into an additional 4745 kyat per year needed to cover health care expenditures at the poverty line. Including health spending additionally raises median per capita expenditures from 1676 kyat per adult equivalent per day to 1727 kyat per adult equivalent per day. The inclusion of health care expenditures reduces the headcount rate of poverty from 32.1 percent to 31.9 percent. The reduction in poverty as a consequence of including health care is potentially a reflection of health shocks that require spending on health care among poor households. An otherwise poor household that suffered a health incident on which they had to spend resources may, after the inclusion of their spending on the treatment, appear non-poor.

Figure 3.20

Sensitivity of poverty line and poverty estimate to health expenditures



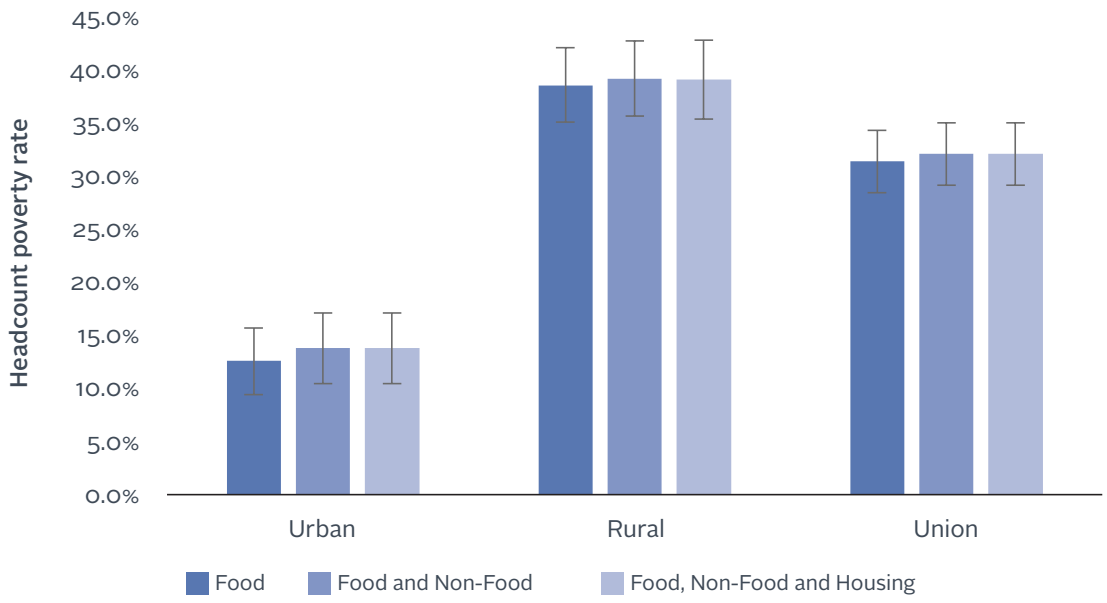
3.4.3 Spatial price index

Prices are likely to vary substantially across Myanmar, where markets are unlikely to be integrated due to the geography and infrastructure. The spatial deflators used in the poverty estimation include food and non-food items. Since food prices are readily available but the prices of non-food items and housing are not, we test the sensitivity of poverty to the approaches that could be used. We control for spatial price differences in two ways. In the first approach, we additionally take into consideration food price variation, using prices estimated from the MPLCS survey. In the second approach, we take into consideration differences in food as well as non-food items and the price of housing. We estimate differences in the price of housing using a regression approach, where we factor out differences in the quality of housing units across locations. Housing accounts for 10 percent of expenditures among individuals in the bottom quintile.

We find that the inclusion of housing in the spatial price deflator does not make a big impact on estimated poverty rates. Since spatial price deflators have the potential to affect the headline rate of poverty as well as the spatial distribution of poverty, we examine both level changes and its disaggregated impact. We see that there is a very small impact on national poverty—from 31.4 percent when including only food to 32.1 percent when including also non-food and housing. Urban poverty is slightly higher when housing is included, likely a reflection of higher housing prices in urban areas. The spatial dimension of poverty changes slightly when the spatial price deflator reflects a more comprehensive basket, a reflection of higher non-food and housing prices in Yangon, the Dry Zone and Coastal areas and relatively lower prices in the Hills and Mountains and Delta region.

Figure 3.21

Sensitivity of poverty estimate to spatial price adjustment



3.4.4 Adult equivalence scales

In this section, we examine the robustness of the poverty profile to alternative approaches to converting household welfare into an individual welfare measure. Specifically, we look at the effects of using per capita expenditure and alternative adult equivalence parameters using the equivalence scales and economies of scale that were used in past analyses of poverty in Myanmar. Notably, we deviate from these previous approaches in that we normalize the expenditure aggregate prior to the estimation of the poverty line, as recommended in Deaton and Zaidi (2002).

Previous poverty estimation in Myanmar employed adult equivalence scale by applying the following formula, from Deaton and Zaidi (2002) with modified notation:

$$Adult\ Equivalence = (N_M + \alpha_F N_F + \alpha_C N_C)^{\theta}$$

Where N_M refers to the number of adult males, N_F refers to the number of adult females; N_C refers to the number of children. The adult male equivalence parameters are given by α_F, the cost of a female relative to that of an adult male, and α_C, the cost of a child relative to that of an adult male. The parameter θ captures the extent of economies of scale. Since the elasticity of adult equivalence with respect to "effective size" $(N_M + \alpha_F N_F + \alpha_C N_C)$ is θ, this implies that the measure of economies of scale is (1-θ).

The parameters used to account for adult equivalence varies across the two previous poverty estimates produced in Myanmar. In the previous poverty estimates presented in MNPED et al. (2011), different equivalence scales were used for food and non-food expenditures. For the food consumption equivalence, α_F was set to 0.9, α_C was set to 0.7 and θ was set to 0.9. For the non-food consumption equivalence, α_F was set to 1, α_C was set to 0.3 and θ was set to 0.9. A child was defined as an individual aged between 0 and 14 years of age. Nutritional norms were used to rationalize the food adult equivalence scales, and the non-food equivalence scales were based on those used in countries at similar levels of development, as put forward in Deaton and Zaidi (2002).

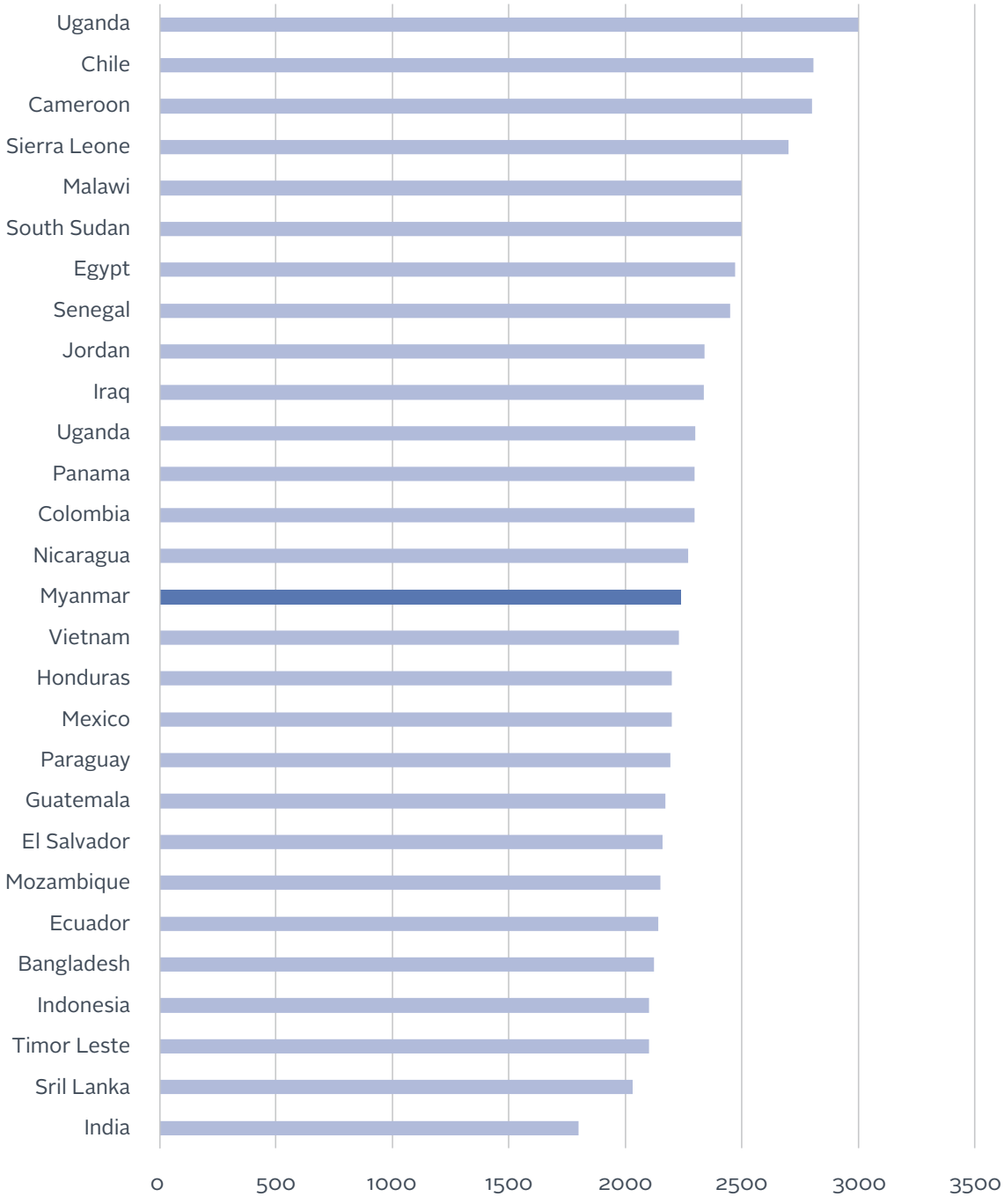
In the alternative methodology used by the World Bank (2014) to also estimate poverty in 2009/10, the same equivalence scale was used for food and non-food expenditure. In this equivalence, no difference was applied to the needs of men and women, therefore α_F was set to 1. For children aged between 0 and 6 years, α_C was set to 0.5. No economies of scale were used (θ was set to 1), reflecting the limited fraction of goods with public goods properties in Myanmar's consumption aggregate. The adult equivalence scales were based on assessments of equivalence used in countries in the region and at similar levels of development (Kozel and Kim, 2015).

3.4.5 Calorie norm

The country norms used by low- and middle-income countries range from 1800 calories per capita (India) to 2800-3000 calories per capita in some African countries (Figure 3.22). The calorie benchmark used in Myanmar falls within the international norms, and within the range of 2200 to 2300 used in most countries.

Figure 3.22

Nutrition norms used to anchor poverty lines in low- and middle-income countries



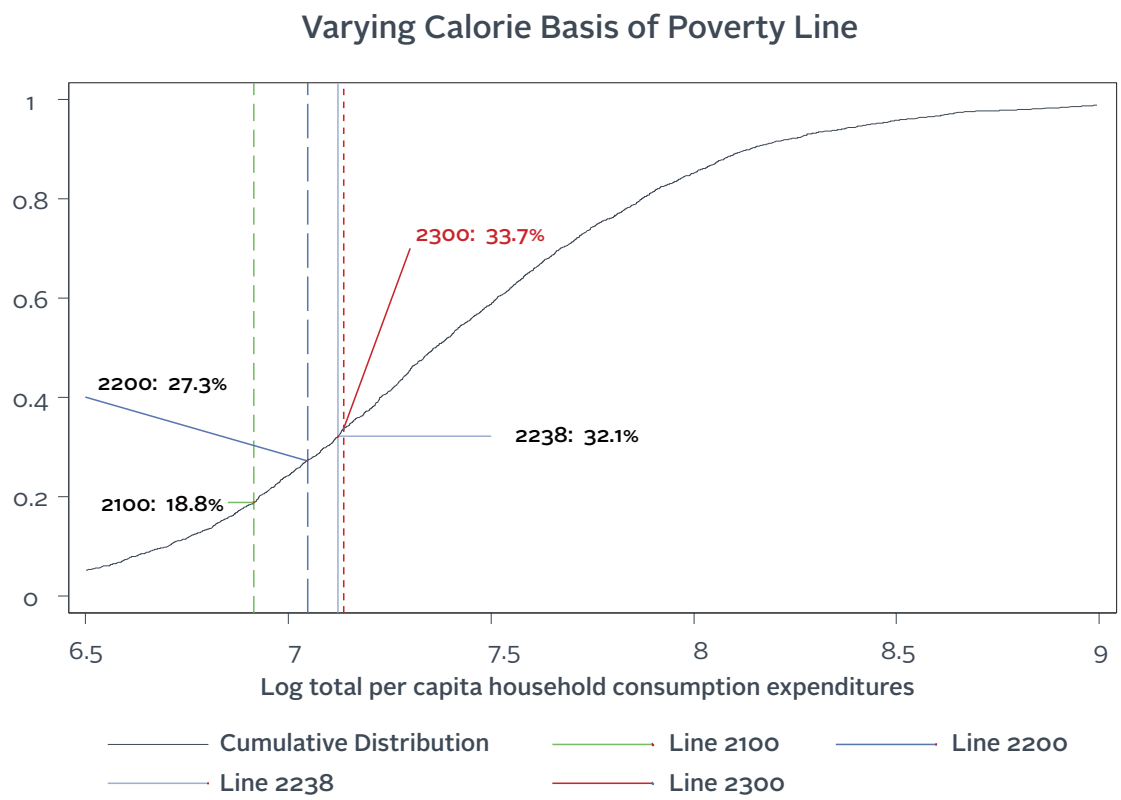
Source: World Bank (2015). These calorie norms reflect the calories used to define national poverty measures based at different points in time.

Poverty estimates are sensitive to the choice of calorie norm used to benchmark daily needs. The current calorie norm is estimated by applying the daily nutritional guidance from the Ministry of Health and Sports to the demographic profile of the population of Myanmar. This generates a per adult equivalent calorie norm of 2238. Since a substantial fraction of individuals live within 200 kyat of the poverty line, changes to the calorie norm used have a substantial impact on poverty rates. Using a 2100 or 2200 calorie benchmark reduces the headcount rate of poverty to 23.8 percent and 29.3 percent respectively.

Similar to many low income countries, a large fraction of Myanmar's population is clustered around the poverty line resulting in sensitivity to the choice of calorie norm. The clustering of households in the vicinity of the poverty line signals substantial vulnerability to poverty where small changes in circumstances—such as climatic shocks, illness or a good yield—can lead to significant movements into and out of poverty.

Figure 3.23

Poverty estimates using different calorie norms

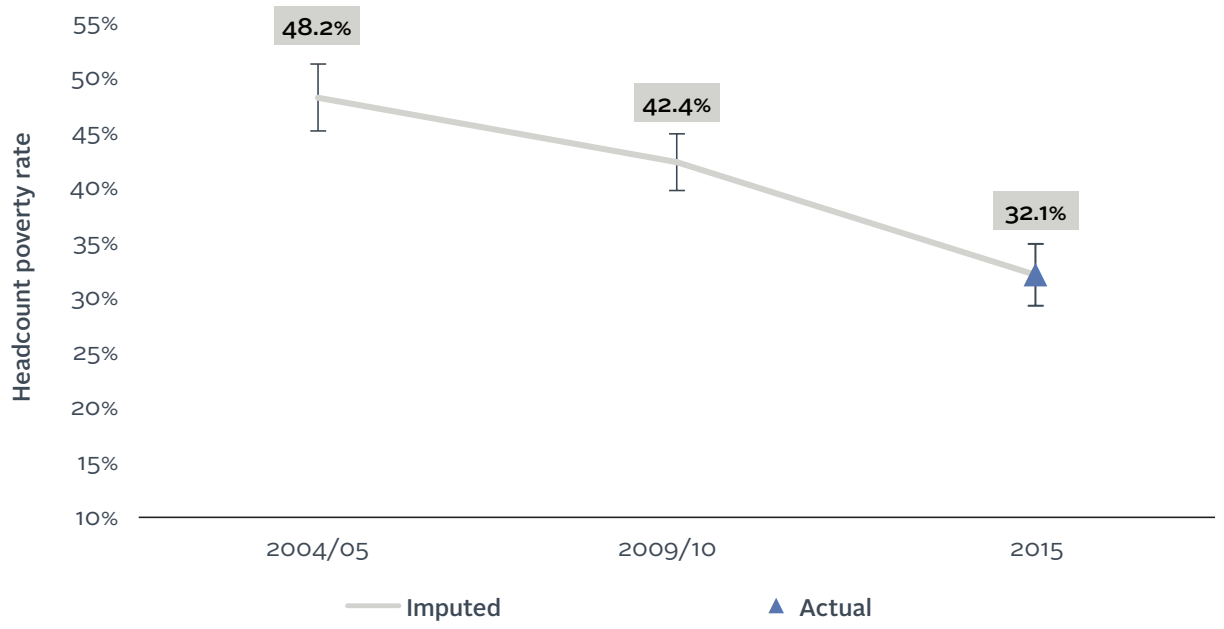


3.5 Poverty Trends using the new 2015-rebased estimate

The imputations methods discussed in Part One of the Poverty Assessment (MOPF and World Bank, 2017a) were used to produce trends of poverty estimates between 2004/05 and 2009/10 that are comparable with those from 2015. We find that poverty declined from 48.2 percent in 2005 to 42.4 percent in 2009/10 and subsequently to 32.1 percent in 2015. Similarly, we see a decline in other measures of poverty that capture the intensity and severity of poverty, as well as is the fraction of the near-poor – those who are living within 20 percent of the poverty line. The analysis of trends using the new aggregate closely mirrors the trends seen in the World Bank (2014) aggregate, notably that poverty declined faster in urban areas than in rural and that growth in mean welfare in urban areas was higher on average than in rural areas.

Figure 3.24

Estimated trends in poverty rates using the new rebased estimate



Both the trends and poverty estimate are explored in greater detail in the accompanaying Poverty Profile.

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Annexes

Annex A1 Variants of the Consumption Aggregate

Before converging upon the preferred method of measuring the welfare aggregate, multiple approaches were examined to assess the implications of assumptions made. This annex addresses all variants, but not all variants are presented in the text assessing the robustness of the poverty estimate to permutations in the consumption aggregate. We ruled out variants by assessing whether they impacted the aggregate component and whether they produced a credible distribution and poverty profile.

Food aggregate

Six variants of the food aggregate were estimated. Food constitutes the majority of consumption expenditures among poor households and is the base of the poverty line estimation. As such, substantial attention was devoted to estimating permutations in the aggregate. The primary difference between the variants of the food aggregate is the prices used (Table A1.1). All variants use the same outlier correction approach described in Section 3.1.1.

After an assessment of the level, composition and relationship between the variants, variant 4 was determined to most accurately capture the food expenditures of the population of Myanmar. There was relatively little difference between variants 2 through 4 in the geographic distribution of expenditures. Mean and median expenditures are highest in Yangon and lowest in the Delta across these variants. Variant 1, by contrast, produces a different ordering across zones and a lower aggregate (by approximately

Table A1.1

Variants of food aggregate

No	Prices	Imputation method
1	Unit value prices from household survey; unit values estimated using supervisor-determined item conversion for non-standard units.	Administrative: Nearest non-missing value based on rural/urban definition and administrative area conditional upon at least 3 households in the area reporting a price.
2	Unit value prices from household survey; unit values estimated using median supervisor-determined item conversion for non-standard units.	Administrative: Nearest non-missing value based on rural/urban definition and administrative area conditional upon at least 3 households in the area reporting a price.
3	Prices from community module	Administrative: Nearest non-missing value based on rural/urban definition and administrative area conditional upon at least 3 communities in the area reporting a price.
4	Combined unit value prices from household survey and prices from community module. Household unit values estimated using median supervisor-determined item conversion for non-standard units.	Administrative: Nearest non-missing value based on rural/urban definition and administrative area, conditional upon at least 3 households or communities in the area reporting a price.
5	Combined unit value prices from household survey and prices from community module. Household unit values estimated using median supervisor-determined item conversion for non-standard units.	Distance: Nearest non-missing value based on physical distance using distance weights, conditional upon at least 3 households in the area reporting a price.
6	Combined unit value prices from household survey and prices from community module. Household unit values estimated using median supervisor-determined item conversion for non-standard units.	Distance: Nearest non-missing value based on physical distance using square-root distance weights, conditional upon at least 3 households in the area reporting a price.

20 percent). Variants 5 and 6 were computationally intensive with little clear additional benefit, and were therefore excluded. An in-depth assessment of unit values and conversion factors led us to exclude these variants from the estimation.

Non-food aggregate

The non-food component of expenditures includes items that: (i) contribute to household well-being; (ii) are not "lumpy" in nature; and (iii) do not constitute investment expenditures. We present variants 1 through 6 below for completeness; we however narrow down our focus on variants 7 through 9 in the analysis. Variants 1 through 6 were excluded based on following the recommendations from the poverty measurement literature (Deaton and Zaidi, 2002).

Table A1.2

Variants of non-food aggregate

Included items	Variant								
	1	2	3	4	5	6	7	8	9
Non-food items									
Energy for household use	✔	✔	✔	✔	✔	✔	✔	✔	✔
Water	✔	✔	✔	✔	✔	✔	✔	✔	✔
Cosmetics and personal apparel	✔	✔	✔	✔	✔	✔	✔	✔	✔
Medicines and drugs not included in health module	✔	✔	✔	✔	✔	✔	✔	✔	✔
Local transport	✔	✔	✔	✔	✔	✔	✔	✔	✔
Other non-food items, incl. telecommunications	✔	✔	✔	✔	✔	✔	✔	✔	✔
Clothing and apparel	✔	✔	✔	✔	✔	✔	✔	✔	✔
of which: Gold jewelry, gems, and precious stones	✔			✔					
Home equipment	✔	✔	✔	✔	✔	✔	✔	✔	✔
House repairs and expenses, incl. property taxes	✔	✔		✔	✔				
Travel and trips, excl. for medical and health reasons	✔	✔	✔	✔	✔	✔	✔	✔	✔
Other expenses, e.g. weddings, funerals, transfers	✔	✔	✔						
Health and education									
Health, including medicines								✔	✔
Education, incl. vocational training and travel							✔		✔
Assessed in text							✔		✔
Preferred							✔		

Durables

As noted in MNPED et al. (2011), the estimation of durable use value in Myanmar was complicated by the finding of positive depreciation rates in 2004/05, attributable in part to the incomplete and imperfect market for some goods. The removal of restrictions on imports and expansion in goods available is likely to result in a decline in scarcity value and in general prices of goods over time. As such, the conventional method to estimate depreciation rates—using the ratio of real current value to real purchased value—would likely capture a decline in scarcity values for multiple goods as well as a decline in value due to depletion and usage. The conventional approach to estimating depreciation is therefore likely to overstate depreciation.

Estimating depreciation rates using the cost if purchased at the time of the survey (and subsequently deflated to real purchase value using inflation rates) suffers from one drawback: goods that were originally purchased second hand would be priced today as though they were purchased new. As a consequence, we would expect to find the depreciation rate estimated from current replacement costs to be upward biased.

In Section 3.1.3 we describe two options for estimating depreciation rates: using the cost at the time of purchase and the cost if purchased new today. In the table below, we show the depreciation rates under these two scenarios. Although ultimately the use of different depreciation rates did not substantially impact the poverty estimates, some tangible differences between the two sets of depreciation rates are clear. The depreciation rates calculated using the cost at the time of purchase are higher than those estimated using the cost today; this suggests that there was a component of scarcity decline in these rates. Indeed, the comparison suggests that the scarcity premium bias is likely to be greater than any bias caused by using (potentially) new rather than second-hand items. This analysis uses the second, non-conventional depreciation method, notably using cost if purchased at the time of the survey.

Table A1.3

Comparison of depreciation rates by item

Depreciation estimated using:	Cost at purchase	Cost new today
Battery	0.53	0.50
Electric inverter	0.33	0.27
Generator	0.21	0.14
Gas stove	0.33	0.25
Charcoal stove	0.58	0.54
Hot plate	0.40	0.35
Electric stove	0.46	0.42
Rice cooker	0.40	0.35
Electric iron	0.36	0.29
Electric fan/ Air cooler	0.40	0.32
Refrigerator/ Deep freezer	0.29	0.22
Washing machine	0.30	0.23
Air conditioner	0.29	0.21
Water heater	0.26	0.21
Electric heater	0.31	0.23
Radio	0.48	0.42
Stereo/ Hi-Fi cassette (with CD player)	0.33	0.19
Color TV	0.29	0.20
Satellite dish (any type including Paid TV)	0.34	0.25
VCD/DVD player	0.37	0.29
Loudspeaker	0.27	0.20
Computer (any type)	0.29	0.20
Printer	0.24	0.17
Line telephone	0.31	0.06
Mobile phone (including SIM card)	0.45	0.29
Bicycle	0.30	0.24
Motorcycle/moped/tuk tuk	0.23	0.20
Motor vehicle	0.21	0.07
Canoe/Boat (not used for fishing)	0.18	0.22
Trishaw	0.19	0.15
Truck (6 Wheels and above)	0.12	0.06

Annex A2 Estimation of Poverty Line: Calories

Adult Equivalence Scales

The Ministry of Health's estimates of dietary needs are used to define an adult equivalence scale. We however deviate from scales based entirely on calorie needs in three ways. First, we treat the needs of girls and boys the same. Second, we apply an additional need factor of 1.3 to the calorie needs of a child under 3 years of age, to account for the higher quality calories needed in the first 1000 days of development. Finally, we assume that the non-food needs of adolescents are equivalent to those of adults, and that the share of expenditures from non-food items is 0.3.

Table A2.1

Adult equivalence parameters

Age in years	Calories needs from Ministry of Health	Calorie need applied	Adult equivalence parameter
Child			
1	850	850	0.55
1-3	1260	1260	0.67
4-6	1670	1670	0.78
7-9	1800	1800	0.83
Adolescents			
10-12	2400 (male) 2200 (female)	2300	0.97
13-15	2600 (male) 2400 (female)	2500	1.04
16-19	3000 (male) 2500 (female)	2750	1.11
Adult (moderate activities)	2800 (male) 2000 (female)	2400	1

Caloric adjustment of food items

Earlier poverty estimates in Myanmar used calories of edible portions; this revision to the poverty estimation methodology applies the calories of food as purchased. Tangibly, food as purchased includes non-edible parts such as banana peel or the carcass of a chicken. The rationale for doing this is that household surveys capture food weights as purchased—a household will report eating a bunch of bananas or a large watermelon—and to convert this into calories consumed. We therefore apply a "wastage factor" to account for the component that is not consumed. For items such as rice and pulses, where there is no wastage factor, the calories applied are the same as those used in previous poverty estimation in Myanmar. For other items such as fish, meat, vegetables and fruits, we apply a wastage factor that tends to reduce the calories consumed. In the case of meat, the calories consumed depend on the age and fat of the animal. We reviewed the calories consumed by meat and noted that the leanest of animals were previously assumed. The calories of meat have to therefore often be revised upwards, to reflect a more average animal.

Table A 2.2

Overview of calories per kilogram per item

Item code	Item Label MPLCS	Original Calories per kilo	Updated calories per kilo	Source	Description	Reason for revising calorie value
Rice and cereals						
8001	Rice (Ngasein)	3820	3820	MNPED (2011)		
8002	Rice (Emata)	3540	3540	MNPED (2011)		
8003	Rice (Medone)	3510	3510	MNPED (2011)		
8004	Rice (Nga kywe)	3570	3570	MNPED (2011)		
8005	Kaukhnyin (Sticky Rice)	3590	3590	MNPED (2011)		
8006	Other rice (local variety)	3570	3570		Same as 8004	
8007	Corn	3560	3560	MNPED (2011)		
8008	Other rice and cereals(specify)	3400	3400	FAO	Wheat	
8009	Other rice and cereals(specify)	3400	3400	FAO	Wheat	
Pulses, beans, nuts, and seeds						
8010	Pegyi (lablab beans)	3520	3520	MNPED (2011)		
8011	Pegya	3610	3610	MNPED (2011)		
8012	Pe poke	3550	3550	MNPED (2011)		
8013	Sadawpe (green peas)	2470	2470	MNPED (2011)		
8014	Gram (Chick pea)	3680	3680	MNPED (2011)		
8015	Green gram (Pedesane)	3470	3470	MNPED (2011)		
8016	Penilay (Peyaza)	3400	3400	MNPED (2011)		
8017	Butter Bean	3350	3350	MNPED (2011)		
8018	Other peas		3575		Mean of green peas & chick peas	
8019	Sesame	5820	5820	MNPED (2011)		
8020	Groundnut without shell	5480	5480	MNPED (2011)		
8021	Coconut	3120	1500	MNPED (2011) – applied wastage	Wastage factor: 52	Updated to remove non-edible components.
8022	Other (specify):	3400	3400	FAO	Pulses not elsewhere specified	
8023	Other (specify):	3400	3400	FAO	Pulses not elsewhere specified	
8024	Other (specify):	3400	3400	FAO	Pulses not elsewhere specified	

Item code	Item Label MPLCS	Original Calories per kilo	Updated calories per kilo	Source	Description	Reason for revising calorie value
Roots and tubers						
8025	Sweet potatoes	1300	950	FAO		Updated to remove non-edible components.
8026	Potatoes	840	670	FAO		Updated to remove non-edible components.
8027	Radish	260	190	FAO 1972		Updated to remove non-edible components.
8028	Taro	940	860	FAO		Updated to remove non-edible components.
8029	Pemyit / Root of bean tree	1480	1480	http://caloriecount.about.com/calories-winged-bean-tuber-i11599		
8030	Palm shoot	1150	577	FAO 1972, WF from ministry	Applied wastage factor of bamboo shoot: 44	Updated to remove non-edible components.
8031	Other (specify):	910	910	FAO	Roots and Tubers not elsewhere specified	
8032	Other (specify):	910	910	FAO	Roots and Tubers not elsewhere specified	
8033	Other (specify):	910	910	FAO	Roots and Tubers not elsewhere specified	
Meat, dairy, eggs						
8034	Chicken	990	1220	FAO	Young bird, dressed, refuse, head, feet, viscera and bones	Increased value up to reflect international values. Updated to remove non-edible components.
8035	Duck	2240	2910	FAO		Increased value up to reflect international values. Updated to remove non-edible components.
8036	Beef	1500	2180	MNPED (2011) - wastage	Applied wastage factor 15	Increased quality of meat from very thin to medium-fat.
8037	Pork	3380	3359	FAO		Changed to medium-fat meat.
8038	Mutton	1790	2060	MNPED (2011) - wastage	Wastage factor: 14	Changed to medium fat.

Item code	Item Label MPLCS	Original Calories per kilo	Updated calories per kilo	Source	Description	Reason for revising calorie value
8039	Dried Meat	2800	2800	MNPED (2011)		
8040	Chicken eggs	1700	1390	FAO		Updated to remove non-edible components. Corrected to reflect international values
8041	Duck eggs	1890	1660	MNPED (2011) - wastage	Wastage factor: 12	Updated to remove non-edible components.
8042	Quail eggs	1610	1430	MNPED (2011) - wastage	Wastage factor: 12	Updated to remove non-edible components.
8043	Fresh milk	750	630	FAO	Cow Milk, Whole, Fresh	Correcting to reflect international values
8044	Branded condensed milk	3370	3370	MNPED (2011)		
8045	Other (specify):	1260	1260	FAO	Meat not elsewhere specified	
8046	Other (specify):	1260	1260	FAO	Meat not elsewhere specified	
8047	Other (specify):	1260	1260	FAO	Meat not elsewhere specified	
Fish and other seafood						
8048	Ngamyitchin (river, medium)	970	682	MNPED (2011), WF from FAO 1972	Wastage factor: 42, from item 8058	Updated to remove non-edible components.
8049	Ngagyin (river, medium)	900	648	MNPED (2011) - wastage	Wastage factor: 40	Updated to remove non-edible components.
8050	Ngayant / Catfish	890	622	MNPED (2011) - wastage	Wastage factor: 43	Updated to remove non-edible components.
8051	Ngakhu (small catfish)	980	699	MNPED (2011) - wastage	Wastage factor: 41	Updated to remove non-edible components.
8052	Ngagyee (small river fish)	1040	828	MNPED (2011), WF from FAO 1972	Wastage factor: 29, from item 8057	Updated to remove non-edible components.
8053	Ngapyayma (medium river fish)	1370	963	MNPED (2011), WF from FAO 1972	Wastage factor: 42, from item 8058	Updated to remove non-edible components.
8054	Ngaton/ Ngamyinn (Butter fish)	1150	691	MNPED (2011), WF from FAO 1972	Wastage factor: 57	Updated to remove non-edible components.
8055	Ngathalauk (helsa fish)	2730	1870	MNPED (2011), WF from FAO 1972	Wastage factor: 45	Updated to remove non-edible components.

Item code	Item Label MPLCS	Original Calories per kilo	Updated calories per kilo	Source	Description	Reason for revising calorie value
8056	Fish meat	890	890	MNPED (2011)		
8057	Other small river fishes (<= 4")	930	740	MNPED (2011), WF from calculations based on FAO 1972	Applied average wastage factor from FAO 1972: 29	Updated to remove non-edible components.
8058	Other medium river fishes (5" - 10")	890	626	MNPED (2011), WF from calculations based on FAO 1972	Applied average wastage factor from FAO 1972: 42	Updated to remove non-edible components.
8059	Other large river fishes (11+")	750	512	MNPED (2011), WF from calculations based on FAO 1972	Applied average wastage factor from FAO 1972: 45	Updated to remove non-edible components.
8060	Kakatit / Seabasse	810	437	MNPED (2011) - wastage	Wastage factor: 46	Updated to remove non-edible components.
8061	Ngamoke (small sea fish)	1190	821	MNPED (2011) - wastage	wastage factor: 31	Updated to remove non-edible components.
8062	Ngapokethin (small sea fish)	1020	500	MNPED (2011) - wastage	Wastage factor: 51	Updated to remove non-edible components.
8063	Sardine (All Kinds)	980	529	MNPED (2011), WF from FAO 1972	Wastage factor: 46	Updated to remove non-edible components.
8064	Pazun Kyawt / Shrimp	820	377	MNPED (2011) - wastage	Wastage factor: 54	Updated to remove non-edible components.
8065	Pazun Doke / River prawn	940	432	MNPED (2011) - wastage	Wastage factor: 54	Updated to remove non-edible components.
8066	Squid/ octopus	750	690	MNPED (2011); WF from FAO 1972	Wastage factor (7)	Updated to remove non-edible components.
8067	Other small sea water fishes (<=4")	1020	723	MNPED (2011), WF from calculations based on FAO 1972	Applied average wastage factor from FAO 1972: 29	Updated to remove non-edible components.
8068	Other medium sea water fishes (5" - 10")	990	542	MNPED (2011), WF from calculations based on FAO 1972	Applied average wastage factor from FAO 1972: 45	Updated to remove non-edible components.
8069	Other large sea water fishes (11+")	1000	552	MNPED (2011), WF from calculations based on FAO 1972	Applied average wastage factor from FAO 1972: 45	Updated to remove non-edible components.
8070	Nga Yantchauk / Dry Catfish	3280	3280	MNPED (2011)		
8071	Other dried small river fish (<=4")	2800	2800	MNPED (2011)		
8072	Other dried medium river fish (5"-10")	2980	2980	MNPED (2011)		

Item code	Item Label MPLCS	Original Calories per kilo	Updated calories per kilo	Source	Description	Reason for revising calorie value
8073	Other dried large river fishes (11+")	2980	2980		Value from medium sized fish	
8074	Ngakunshutchauk / Dry seafish	2070	2070	MNPED (2011)		
8075	Other dried small sea water fish (<=4")	3350	3350	MNPED (2011)		
8076	Other dried medium sea water fish (5"-10")	3350	3350	MNPED (2011)		
8077	Other dried large sea water fishes (11+")		3350		Value from medium sized fish	
8078	Dried Prawns	3380	3380	MNPED (2011)		
8079	Shrimp paste	1650	1650	MNPED (2011)		
8080	Fish/ shrimp sauce	400	400	MNPED (2011)		
8081	Ngapiyae / fishcake	1520	1520			
8082	Nagpikaung/ Salted fish	1280	1280	MNPED (2011)		
8083	Ar Bye Gyauk / dry small fish	3113	3075		Average of small dried fish	
8084	Dried Prawn powder	0	3620	FAO 1972	Dried shrimp, edible portion	
8085	Other (specify):	940	527	MNPED (2011)	Average from medium sized marine and river fish	Updated to remove non-edible components.
8086	Other (specify):	940	527	MNPED (2011)	Average from medium sized marine and river fish	Updated to remove non-edible components.
8087	Other (specify):	940	527	MNPED (2011)	Average from medium sized marine and river fish	Updated to remove non-edible components.
Vegetables						
8088	Pumpkin	270	224	MNPED (2011) + wastage	Wastage factor: 17	Updated to remove non-edible components.
8089	Ash pumpkin	120	86	MNPED (2011) + wastage	Wastage factor: 28	Updated to remove non-edible components.
8090	Brinjal/ Egg plant	260	250	MNPED (2011) + wastage	Wastage factor: 4	Updated to remove non-edible components.
8091	Tomato	200	188	MNPED (2011) + wastage	Wastage factor: 6	Updated to remove non-edible components.

Item code	Item Label MPLCS	Original Calories per kilo	Updated calories per kilo	Source	Description	Reason for revising calorie value
8092	Cabbage	220	187	MNPED (2011) + wastage	Wastage factor: 15	Updated to remove non-edible components.
8093	Cauliflower	290	174	MNPED (2011) + wastage	Wastage factor: 40	Updated to remove non-edible components.
8094	Chayote	190	146	MNPED (2011) + wastage	Wastage factor: 23	Updated to remove non-edible components.
8095	Water leaf	420	336	MNPED (2011) + wastage	Wastage factor: 20	Updated to remove non-edible components.
8096	Roselle leaf	440	420	FAO 1972		Updated to remove non-edible components.
8097	Horseradish leaf	720	440	MNPED (2011) - WF FAO 1972		Updated to remove non-edible components.
8098	Radish leaf	330	264	MNPED (2011) + wastage	Wastage factor: 20	Updated to remove non-edible components.
8099	Pumpkin leaf	210	210	MNPED (2011)		Updated to remove non-edible components.
8100	Cucumber	120	96	MNPED (2011) + wastage	Wastage factor: 20	Updated to remove non-edible components.
8101	Horseradish	420	510	FAO 1972		Updated to remove non-edible components.
8102	Bean/ Long bean	280	266	GMNPED (2011) + wastage	Wastage factor: 5	Updated to remove non-edible components.
8103	Bamboo shoots	280	157	MNPED (2011) + wastage	Wastage factor: 44	Updated to remove non-edible components.
8104	Bean sprouts	300	279	MNPED (2011) + wastage	Wastage factor: 7	Updated to remove non-edible components.
8105	Carrots	440	310	MNPED (2011) + wastage	Wastage factor: 17	Updated to remove non-edible components.
8106	Lettuce	200	150	MNPED (2011) + wastage	Wastage factor: 26	Updated to remove non-edible components.
8107	Fresh chillie	550	1000	MNPED (2011)		

Item code	Item Label MPLCS	Original Calories per kilo	Updated calories per kilo	Source	Description	Reason for revising calorie value
8108	Mustard leaf		230	FAO 1972		Updated to remove non-edible components.
8109	Kinmoon / small sweet gourd		330	MOH Nutrition Unit book	0 wastage	
8110	Gourd leaf	270	270	FAO 1972		
8111	Vegetable gourd	160	136	MNPED (2011) + wastage	Wastage factor: 15	Updated to remove non-edible components.
8112	Other (specify):	220	220	FAO	Vegetables fresh nes	
8113	Other (specify):	220	220	FAO	Vegetables fresh nes	
8114	Other (specify):	220	220	FAO	Vegetables fresh nes	
Fruits						
8115	Bananas	1080	600	FAO		Updated to remove non-edible components. Corrected value to reflect international values
8116	Papaya	450	324	MNPED (2011) + wastage	Wastage factor: 28	Updated to remove non-edible components.
8117	Grapefruit	423	160	FAO		
8118	Watermelon	320	170	FAO		Updated to remove non-edible components. Corrected value to reflect international values
8119	Apple	510	418	MNPED (2011) + wastage	Wastage factor: 18	Updated to remove non-edible components.
8120	Pomelo	379	160	FAO		
8121	Oranges	629	340	FAO		
8122	Plums	455	520	FAO		
8123	Mango	650	468	MNPED (2011) + wastage	Wastage factor: 28	Updated to remove non-edible components.
8124	Lime	360	277	MNPED (2011) + wastage	Wastage factor: 23	Updated to remove non-edible components.
8125	Lemon	150	150	FAO		
8126	Pineapple	470	259	MNPED (2011) + wastage	Wastage factor: 45	Updated to remove non-edible components.

Item code	Item Label MPLCS	Original Calories per kilo	Updated calories per kilo	Source	Description	Reason for revising calorie value
8127	Grapes	674	530	FAO		
8128	Guava	690	676	MNPED (2011) + wastage	Wastage factor: 2	Updated to remove non-edible components.
8129	Mangosteen	570	165	MNPED (2011) + wastage	Wastage factor:71	Updated to remove non-edible components.
8130	Other (specify):	410	410	FAO	Tropical fruit Fresh nes	
8131	Other (specify):	410	410	FAO	Tropical fruit Fresh nes	
8132	Other (specify):	410	410	FAO	Tropical fruit Fresh nes	
Oil and fats						
8133	Groundnut oil	8840	8840	MNPED (2011)		
8134	Sesamum oil	8810	8810	MNPED (2011)		
8135	Palm oil	9000	8840	MNPED (2011)		
8136	Mustard oil	8810	8810	MNPED (2011)		
8137	Other (specify):	8840	8840	FAO	Average of oils	
8138	Other (specify):	8840	8840	FAO	Average of oils	
8139	Other (specify):	8840	8840	FAO	Average of oils	
Spices and condiments						
8140	Dried chilies	2460	2460	MNPED (2011)		
8141	Chilly powder	2460	2460	MNPED (2011)		
8142	Lemon grass	210	210	MNPED (2011)		
8143	Onions	380	380	MNPED (2011)		
8144	Garlic	1170	1060	FAO 1972		Updated to remove non-edible components.
8145	Tumeric powder	3470	3470	MNPED (2011)		
8146	Ginger	930	420	FAO 1972		Updated to remove non-edible components; Corrected value to reflect international values
8147	Salt	0	0	MNPED (2011)		
8148	Seasoning powder	4267	0			
8149	Black pepper	0	3250	MNPED (2011)		
8150	Marsala	0	0	MNPED (2011)		
8151	Other (specify):	0	0	MNPED (2011)		
8152	Other (specify):	0	0	MNPED (2011)		

Item code	Item Label MPLCS	Original Calories per kilo	Updated calories per kilo	Source	Description	Reason for revising calorie value
8153	Other (specify):	0	0	MNPED (2011)		
Other food products						
8154	Dried rice noodle	880	3600	FAO 1972		Corrected to reflect international values.
8155	Dried wheat noodle	3630	3630	MNPED (2011)		
8156	Rice vermicelli	3570	3570	MNPED (2011)		
8157	Bread	2820	2820	MNPED (2011)		
8158	Cake	3930	3930	MNPED (2011)		
8159	Biscuits	4070	4070	MNPED (2011)		
8160	Pone Ye Gyi	2000	1480		Value from soy bean paste	
8161	Bean curd (white)	1913	330	FAO 1972		
8162	Tofu	1452	630	FAO 1972		
8163	Soy bean paste	2000	1480	FAO 1972		
8164	Vermicilli (bean)	3750	3400	FAO 1972		
8165	Green tea leaves	0	300	MNPED (2011)		
8166	Sugar	3510	3510	MNPED (2011)		
8167	Palm jaggery	3590	3590	MNPED (2011)		
8168	Cane jaggery	3830	3830	MNPED (2011)		
8169	Fermented tea leaves	300	300	MNPED (2011)		
8170	Fritters with pea	4740	4740	MNPED (2011)		
8171	Kun yar	420	420	MNPED (2011)		
8172	Coffee mix or tea mix	2150	2150	MNPED (2011)		
8173	Cereal mix	2090	2090	MNPED (2011)		
8174	Ovaltine, horlick, etc.	3756	3756	http://caloriecount.about.com/calories-ovaltine-chocolate-malt-i116817		
8175	Prepared food bought to eat at home - rice or noodle based dishes					
8176	Prepared food bought to eat at home - snacks					
8177	Prepared food bought to eat at home - other					

Item code	Item Label MPLCS	Original Calories per kilo	Updated calories per kilo	Source	Description	Reason for revising calorie value
8178	Other food products (specify):					
8179	Other food products (specify):					
8180	Other food products (specify):					
Alcoholic beverages						
8181	Beer	0	0		Replaced beer / alcohol with zero calories, as the reference basket should not contain beer.	
8182	Toddy alcohol / palm alcohol	0	0			
8183	Local liquors/ alcohol	0	0			
8184	Imported liquor/ alcohol	0	0			

Note: WF: wastage factor, nes: not elsewhere specified

Source: MNPED (2011), FAO (n.d.), FAO (1972), Ministry of Health (n.d.)

Table A2.3

Calories assigned to other categories

Food Item	Number of cases in MPLCS	Source	Food Item in Source	Calories per kg
Other rice and cereals	1	FAO	Wheat (as in specification)	3400
Other pulses, nuts, beans	59	FAO	Pulses nes	3400
Other peas	502	IHLCA	Mean of chick peas and green peas	3075
Other tubers	33	FAO	Roots and tubers nes	910
Other meat & diary	85	FAO	Meat nes	1260
Different specifications of fish (by size)	2101	IHLCA	Follow definition of IHLCA	Different categories
Other fish	181	IHLCA	Mean of medium fresh sea& river fish. Alternative: Marine fish nes 640 (FAO)	527
Other vegetables	822	FAO	Vegetables fresh nes	220
Other fruits	208	FAO	Fruit tropical fresh nes	410
Other Oil and fats	388	FAO	Oils	8840
Other Food products	38	/	30 obs are "tobacco" with 0 calories; the other 8 items did not readily translate into any category.	0

Sources: MNPED et al. (2011b), FAO (n.d.). NES denotes not elsewhere specified.

Table A2.4

Nutritional requirements in Myanmar

Age (Years)	Calories	Frequency (weighted) in MPLCS
Child		
1	850	287
1-3	1260	908
4-6	1670	1042
7-9	1800	1137
Male (Adolescent)		
10-12	2400	624
13-15	2600	513
16-19	3000	569
Female (Adolescent)		
10-12	2200	565
13-15	2400	538
16-19	2500	706
Adult Male (Moderate activities)	2800	4436
Adult Female (Moderate activities)	2000	5326
Add on values:		
Pregnant (five months before delivery)	350	120
Lactating Female (post-partum six months)	550	431
Total population (MPLCS)		16651
	Calories per capita	2247
	Calories per adult equivalent	2238
	Calories per adult male equivalent	2800

Source: Ministry of Health (n.d.)

Annex A3 Poverty Estimates and Sensitivity Analysis

Table A3.1

Calories per item in poverty line food basket – detailed

Food Category	Food Item	2015 Poverty Line, Updated Measure	2009/10 Poverty Line, World Bank (2014)	2004/05 Poverty Line, MNPED et al (2007)
	Total Calories	2238	2300	2340
Pulses, beans, nuts and seeds	Pegyi (lablab beans)	8.17	4.61	8.29
	Pegya	7.48	4.59	12.96
	Pe poke	2.92	2.79	6.61
	Sadawpe (green peas)	3.79	3.55	5.82
	Gram (Chick pea)	14.49	17.99	9.38
	Green gram (Pedesane)	3.86	1.88	9.60
	Penilay (Peyaza)	4.87	5.51	8.29
	Butter Bean	8.15	6.26	10.65
	Other peas	12.84	0.00	0.00
	Sesame	0.66	0.76	5.42
	Groundnut without shell	17.49	23.13	13.96
	Coconut	6.36	3.36	6.84
	Pulses, beans, nuts, and seeds Other (specify):	0.66	0.00	0.00
	Pulses, beans, nuts, and seeds Other (specify)	0.25	0.00	0.00
	Boiled Pea (any kind of peas)	0.00	9.25	6.50
	Cashew nuts	0.00	0.11	18.83
	Black gram (Matpe)	0.00	0.43	9.43
	Pepyin	0.00	0.79	9.58
Meat, dairy, eggs	Chicken	13.95	7.07	3.61
	Duck	2.71	1.21	9.33
	Beef	3.86	9.37	6.86
	Pork	27.90	35.30	17.50
	Mutton	0.04	0.72	5.30
	Dried Meat	0.27	0.36	4.99
	Chicken eggs	12.66	8.49	4.15
	Duck eggs	5.64	6.48	4.92
	Quail eggs	0.16	0.03	1.50
	Fresh milk	0.77	0.77	5.34
	Other meats	2.68	0.00	0.00

Food Category	Food Item	2015 Poverty Line, Updated Measure	2009/10 Poverty Line, World Bank (2014)	2004/05 Poverty Line, MNPED et al (2007)
Fish and other seafood	Ngamyitchin	1.07	2.22	3.75
	Ngagyin	1.42	3.90	3.08
	Ngayant	1.12	3.10	2.97
	Ngakhu	0.61	1.60	2.93
	Ngagyee	0.12	0.38	2.88
	Ngapyayma	1.20	1.98	4.69
	Ngaton/ Ngamyinn	0.76	1.43	3.69
	Ngathalauk	0.59	3.39	9.20
	Fish meat	0.08	0.62	1.68
	Other small river fishes	1.86	3.73	3.41
	Other medium river fishes	0.92	1.11	3.39
	Other large river fishes	0.04	0.11	2.59
	Kakatit	0.12	0.34	2.82
	Ngamoke	0.81	0.51	3.94
	Ngapokethin	0.18	1.21	2.91
	Sardine (All Kinds)	0.42	0.52	3.84
	Pazun Kyawt	0.32	1.48	2.34
	Pazun Doke	0.02	0.11	1.98
	Squid and like sea fishes	0.17	0.24	2.73
	Other small sea water fishes	2.51	1.46	5.53
	Other medium sea water fishes	0.77	0.71	4.67
	Other large sea water fishes	0.03	0.13	3.40
	Nga Yantchauk	0.83	1.80	5.84
	Other dried small river fish	2.04	2.95	5.98
	Other dried medium and above river fish	2.47	1.08	5.96
	Other dried medium and above river fish	0.18	1.08	5.96
	Ngakunshutchauk	0.05	0.38	3.57
	Other dried small sea water fish	5.07	2.55	8.26
	Other dried medium and above sea water fish	1.40	1.36	7.62
	Other dried medium and above sea water fish	1.00	1.36	7.62
	Dried Prawns	1.29	1.60	2.78
	Shrimp paste	5.71	4.19	2.94
	Fish/ shrimp sauce	0.84	0.82	0.84
	Ngapiyae	6.88	5.19	4.58
	Nagpikaung/ Salted fish	0.84	0.78	2.91

Food Category	Food Item	2015 Poverty Line, Updated Measure	2009/10 Poverty Line, World Bank (2014)	2004/05 Poverty Line, MNPED et al (2007)
Fish and other seafood	Ar Bye Gyauk	1.74	4.44	0.00
	Dried prawn powder	0.24	0.33	0.00
	Other fish products	0.47	0.00	0.00
	Fish and other seafood Other (specify)	0.01	0.00	0.00
	Fish and other seafood Other (specify)	0.01	0.00	0.00
	Ngashwe	0.00	0.28	3.76
Roots and tubers	Sweet potatoes	2.81	3.24	8.23
	Potatoes	11.00	8.35	3.75
	Radish	0.81	0.81	1.04
	Taro	1.52	1.44	5.61
	Pemyit	3.68	1.37	0.00
	Palm shoot	0.67	2.16	0.00
	Roots and tubers Other (specify)	0.16	0.00	0.00
	Palawpenan	0.00	0.44	0.00
	Yams	0.00	0.14	2.81
	No Ko	0.00	0.03	0.00
	Arrow shoot	0.00	0.09	0.00
Vegetables	Pumpkin	0.91	0.74	1.26
	Ash pumpkin	0.14	0.20	0.59
	Brinjal/ Egg plant	4.41	2.58	1.21
	Tomato	5.50	2.80	1.33
	Cabbage	3.27	1.38	1.01
	Cauliflower	1.34	1.32	0.96
	Chayote	0.05	0.47	1.48
	Water leaf	3.26	10.93	4.35
	Roselle leaf	3.39	6.53	2.78
	Horseradish leaf	0.25	0.37	1.10
	Radish leaf	0.11	0.30	0.61
	Pumpkin leaf	0.16	0.16	0.56
	Cucumber	0.29	0.49	0.40
	Horseradish	0.87	0.43	0.97
	Bean/ Long bean	0.94	1.39	0.92
	Bamboo shoots	0.30	0.43	0.63
	Bean sprouts	0.41	0.73	0.69
	Carots	0.07	0.10	0.66
	Lettuce	0.08	0.08	0.24

Food Category	Food Item	2015 Poverty Line, Updated Measure	2009/10 Poverty Line, World Bank (2014)	2004/05 Poverty Line, MNPED et al (2007)
Vegetables	Chillie/ pepper/ sweet pepper	4.30	1.29	0.72
	Mustard leaf	1.13	0.00	0.00
	Kinmoon	0.01	0.00	0.00
	Gourd leaf	1.40	0.00	0.00
	Gourd	2.78	1.45	0.80
	Other vegetables	0.36	0.00	0.00
	Vegetables Other (specify)	0.07	0.00	0.00
	Vegetables Other (specify)	0.03	0.00	0.00
	Lime	0.19	0.22	0.24
	Fresh pepper/Sweet pepper	0.00	0.02	0.00
	Kha We	0.00	0.19	0.00
	Citrics	0.00	0.04	0.00
Fruits	Banana	10.26	20.10	8.79
	Papaya	1.43	4.33	4.09
	Grapefruit	0.00	0.16	0.00
	Watermelon	5.80	0.65	2.04
	Apple	0.61	3.53	2.71
	Pomelo	0.01	0.48	0.00
	Oranges	0.69	6.15	0.00
	Plums	1.34	0.35	0.00
	Mangoes	1.00	18.13	6.66
	Lemon	0.07	0.00	0.00
	Pineapples	0.00	0.58	5.45
	Grapes	0.17	0.11	0.00
	Guava	0.50	0.49	3.42
	Mangosteens	0.00	0.19	1.56
	Other fruits	0.25	0.00	0.00
	Rambutan (Kyetmouk)	0.00	0.07	0.53
	Pear	0.00	0.02	2.87
	Durian	0.00	0.42	5.67
	Strawberry	0.00	0.00	0.00
	Custard Apple	0.00	0.01	1.67
	Sunkist	0.00	0.06	0.00
	Jackfruit	0.00	0.04	0.00

Food Category	Food Item	2015 Poverty Line, Updated Measure	2009/10 Poverty Line, World Bank (2014)	2004/05 Poverty Line, MNPED et al (2007)
Spices and condiments	Dried chilies	9.65	6.56	3.30
	Chilly powder	3.68	2.58	1.89
	Lemon grass	0.01	0.04	0.14
	Onions	8.08	3.92	1.71
	Garlic	5.91	3.10	1.35
	Tumeric powder	2.82	2.28	1.14
	Ginger	1.14	0.78	0.56
	Seasoning powder	0.00	6.07	0.00
	Black pepper	0.21	0.00	0.00
	Mustard seeds	0.00	0.02	0.00
Other food products	Dried rice noodle	2.94	0.74	3.45
	Dried wheat noodle	5.58	5.89	10.54
	Rice vermicelli	3.10	4.65	8.80
	Bread	2.96	17.25	17.85
	Cake	3.58	6.73	9.58
	Biscuits	3.16	9.99	14.50
	Pone Ye Gyi	0.54	0.29	0.00
	Bean curd (white)	0.42	0.41	0.00
	Tofu	1.99	0.30	0.00
	Soy bean paste	0.69	15.71	0.00
	Vermicilli (bean)	0.10	18.24	0.00
	Green tea leaves	1.01	0.00	0.00
	Sugar	7.91	4.75	2.98
	Palm jaggery	7.67	5.81	4.23
	Cane jaggery	6.96	1.67	4.09
	Green tea leaves	0.45	0.00	0.00
	Fritters with pea	13.14	4.84	3.51
	Areaca nuts/ Betel nuts	1.70	1.08	0.00
	Coffee mix or tea mix	4.15	1.41	1.12
	Cereal mix	0.51	0.21	0.92
	Ovaltine, horlick, etc.	0.68	0.31	0.00
	Bean curd (brown)	0.00	0.06	0.00
Alcoholic beverages	Beer	0.00	0.31	0.00
	Toddy alcohol	0.00	4.37	0.00
	Local liquors/alcohol	0.00	1.32	0.00
	Imported liquors/alcohol	0.00	0.04	0.00
	Rice wine (Khaung Ye)	0.00	0.92	0.00

Food Category	Food Item	2015 Poverty Line, Updated Measure	2009/10 Poverty Line, World Bank (2014)	2004/05 Poverty Line, MNPED et al (2007)
Food and beverages taken outside home	Prepared food bought to eat at home - rice or noodle based dishes	4.20	0.00	0.00
	Prepared food bought to eat at home - snacks	12.22	0.00	0.00
	Prepared food bought to eat at home - other	0.29	0.00	0.00
	Breakfast away from home	33.09	0.00	0.00
	Lunch away from home	34.30	0.00	0.00
	Dinner away from home	29.40	0.00	0.00
	Snacks away from home	15.73	0.00	0.00
	Butter spread nan/bread	0.00	0.24	8.38
	Rice based traditional snacks	0.00	8.49	21.77
	Palata (parala - an Indian pancake)	0.00	2.14	6.33
	Hot tofu	0.00	1.53	15.16
	Rice noodle/vermicelli salad/soup	0.00	0.20	3.91
	Shan noodle/ Mie Shay	0.00	3.08	19.28
	Alcoholic beverages taken outside home	0.00	0.08	0.00
	Fried rice	0.00	4.75	19.40
	Pauksi (Chinese steamed bun with stuffing)	0.00	0.59	6.77
	Myanmar vermicelli (for breakfast)	0.00	3.85	5.88
	Ekyarkway	0.00	4.30	6.55
	Wheat noodle salad/soup	0.00	0.15	3.53
	Brewed tea/coffee taken outside home	0.00	2.82	3.02
	Fried noodle/ Cutkyikite	0.00	0.69	10.23
	Softdrinks and/or juices taken outside home	0.00	0.34	1.54
	Mohingar/ Nhyat noodle	0.00	9.84	7.41
	Fried bean curd (tohu)	0.00	0.63	3.96
	Samosa (fried stuffed pastry)	0.00	1.89	4.32
	Fried snack (gourd/ pulses ... etc.)	0.00	9.49	6.20
	Nan with boiled bean	0.00	0.37	3.24

Food Category	Food Item	2015 Poverty Line, Updated Measure	2009/10 Poverty Line, World Bank (2014)	2004/05 Poverty Line, MNPED et al (2007)
Rice and cereals	Rice (Ngasein)	297.76	490.07	374.67
	Rice (Emata)	289.05	501.24	331.60
	Rice (Medone)	39.96	53.79	295.22
	Rice (Nga kywe)	40.84	93.38	232.39
	Kaukhnyin (Sticky Rice)	3.19	7.62	41.90
	Other rice (local variety)	790.43	143.99	0.00
	Maize seeds (dry)	3.60	0.60	66.80
	Millet	0.00	0.37	0.00
	Sorghum	0.00	0.04	0.00
	Wheat	0.00	0.23	0.00
	Flour (Rice)	0.00	0.14	5.31
	Flour (Wheat)	0.00	0.07	7.40
Oil and fats	Groundnut oil	76.54	55.27	41.41
	Sesamum oil	33.20	41.81	56.48
	Palm oil	115.77	40.25	40.19
	Mustard oil	4.66	1.87	22.69
	Other cooking oil and fat	22.70	0.00	0.00
	Pork fat	0.00	0.47	0.00
	Ghee	0.00	0.00	1.40
	Sunflower oil	0.00	2.74	46.44
Milk products	Branded condensed milk	2.70	2.29	4.25
	Domestic condensed milk	0.00	0.02	3.23
	Formula milk for infants	0.00	0.30	7.64
	Milk powder	0.00	0.21	4.05
	Butter	0.00	0.03	2.40
Other food items	Potato chips	0.00	2.37	0.00
	Pickled tea	0.00	0.16	0.12
	Betel leafs	0.00	0.69	0.62
	Coffee (grinded or beans)	0.00	0.00	0.03
	Horlick	0.00	0.02	0.00
	Non-dairy creamer	0.00	2.07	56.65

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