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A MENU OF OPTIONS FOR INTRA-HOUSEHOLD POVERTY ASSESSMENT

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A MENU OF OPTIONS FOR INTRA-HOUSEHOLD POVERTY ASSESSMENT

Author:
Sarah Gammage

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ACRONYMS

AAU	Addis Ababa University
CHNS	China Health and Nutrition Survey
CSAE	Center for the Study of African Economies at Oxford University
DECRG	Development Economics Research Group
ERHS	Ethiopian Rural Household Survey
IFPRI	International Food Policy Research Institute
IRIS	Center for Institutional Reform and the Informal Sector at the University of Maryland
LSMS	Living Standards Measurement Survey
PAT	Poverty Assessment Tool
RDA	Recommended Daily Allowance
USAID	United States Agency for International Development

EXECUTIVE SUMMARY

Background

As part of a Congressional mandate in the 2003 Amendment of the Microenterprise for Self-Reliance Act of 2000, USAID is responsible for developing accurate, low-cost methods for poverty assessment to be used by microenterprise programs. This mandate calls for methods that can be used by microenterprise practitioners to assess to what extent they reach the very poor.¹ To this end, the Center for Institutional Reform and the Informal Sector (IRIS Center) at the University of Maryland was contracted by the United States Agency for International Development Microenterprise Development office to develop and field test poverty assessment tools for use by institutions providing microenterprise assistance.

The USAID Microenterprise Development office, in turn, requested technical assistance from the USAID Office of Women in Development, through its contractor DevTech Systems, to work with the IRIS Center to take account of the effects of gender differences in the construction and application of the tools. This report, which focuses on the consideration of gender in the design of the Poverty Assessment Tools, complements the work being undertaken by IRIS and provides additional recommendations for how these poverty tools may be adapted to assess the presence of intra-household poverty and inequality. The objective of this report is to draw attention to the presence of intra-household inequality and develop a menu of options for developing and testing methods to assess intra-household poverty.

Households are aggregations of individuals who may act cooperatively or competitively when generating and using resources such as income or accessing assets such as land and financial wealth. It is clear that not all households share resources and assets equally and that some members may be relatively more privileged than others, commanding more income and accessing greater consumption opportunities. Where this is the case, some members of a household may be more likely to be very poor than others. There is also evidence that intra-household inequality and poverty may disproportionately affect women, children and the aged.

The report offers a preliminary assessment of gender-sensitive intra-household poverty tools and provides recommendations for further research and pilot-testing to develop such tools.

Objectives

This report aims to complete the following:

- review the literature on intra-household inequality;
- provide a critical assessment of the existing literature's ability to measure intra-household dynamics accurately and at low-cost; and,
- identify potential approaches for practical, applicable measures that could augment the existing Poverty Assessment Tools instruments to address intra-household inequality and poverty.

¹ According to the Microenterprise Results and Accountability Act of 2004, the term 'very poor' means individuals—“(A) living in the bottom 50 percent below the poverty line established by the national government of the country in which those individuals live; or “(B) living on the equivalent of less than \$1 per day.”

Poverty Assessment Tools

Currently, the Poverty Assessment Tools² project uses a variety of data on clothing expenditures, assets, education, housing, and consumer durables and a number of simple control variables, such as the household size and age of household head, to predict expenditures per capita. Predicted expenditure per capita is then used to determine whether the household falls below the per capita poverty line of US\$1 per person per day³ or in the bottom 50 percent of the population living below the poverty line established by the national government.⁴ The household is defined as being very poor if per capita expenditures⁵ fall below these lines. The microenterprise institution is at liberty to choose the measure which yields the highest headcount of the “very poor.”

The Poverty Assessment Tools measure the percentage of very poor households among microenterprise clients; hence they are designed to measure poverty on a collective, rather than individual, basis. They are less likely to be accurate at predicting household-level poverty. Accuracy refers to two types of measurement errors: misclassifying a very poor household as not very-poor; and the opposite, misclassifying a not very-poor household as very poor. The Poverty Assessment Tools have been designed to minimize these types of errors ensuring that the number of very poor households misclassified as not very-poor is the same as the number households misclassified in the other direction.⁶

Existing Measures of Intra-Household Inequality and Data Requirements

Most measures of household poverty assume that all resources that enter the household are shared equally. Consequently, taking income or consumption and dividing it by the total number of individuals in a household yields a measure of approximate per capita resources available to each individual. This measure is then compared to a poverty line to determine whether the household is poor or non-poor. If the per capita measure of resources available to an individual within the household is higher than the chosen poverty line, then the household is determined to be non-poor.

² A team based at the [IRIS Center](#) at the University of Maryland is implementing this work with USAID's [Microenterprise Development division](#) under the Enabling Environment component of the Accelerated Microenterprise Advancement Project (AMAP). See www.povertytools.org/ for more information.

³ This is expressed in terms of purchasing power parity at 1993 prices using the Penn World tables.

⁴ These represent national poverty lines and do not take into account differences between rural and urban cost of living.

⁵ These expenditures are used as a measure of the use of resources to satisfy current needs and wants. Since assets are included, this is a measure that is broader than consumption and captures some savings behavior.

⁶ In a large enough sample, individual misclassifications are unimportant, since the two types of errors would cancel each other out, regardless of how large they are. However, these misclassifications will matter at the individual household level. This explains why the same tool can be very accurate when measuring poverty at a collective level, but less accurate if used on an individual basis.

This approach, however, assumes that the household is unitary⁷, that decisions about the allocation of resources within the household can be modeled as if there were a single, neutral decision-maker.⁸ But if households are not unitary, and individuals compete for resources, then not all members of a household are likely to be equally poor or equally well-off. Households that have been determined to be very poor or not very poor using the predicted consumption measures derived from the Poverty Assessment Tools analysis may contain members who do not command equivalent resources. Some of these household members may in fact be very poor themselves while others may not. Establishing that a household is not very poor using predicted per capita expenditures is neither necessary nor sufficient to ensure that all members of that household are not very poor and vice versa.

A number of methods exist to try and gauge intra-household inequality. Most prominently, consumption and nutrition data have been used to ascertain who commands more resources within the household. Similar approaches have been undertaken with investment in human capital and expenditures on education and health care. Finally, a body of research has focused on asset ownership and title to productive resources such as land, financial capital, machinery, and housing.

- Consumption and nutrition. The majority of studies that explore the intra-household distribution of food use anthropometric indicators such as weight-for-age and height-for-age. Anthropometric measurements are most useful for establishing intra-household inequality among children and infants. These indicators have been standardized by measurements from an appropriate and healthy reference population. Other studies rely on the nutrient intakes of individuals and attempt to assess whether these meet established requirements for maintaining wellbeing. These survey instruments are typically complex and require tracking nutrient intake per person over a period of time, using either 24-hour recall or direct observation by weighing the food before and after cooking.
- Investment in human capital. The development literature also focuses on intra-household inequality in investments in human capital, most notably health care and education. Survey instruments typically collect data on the use of household resources for investment in individual human capital. Many such studies consider both the direct costs of payment for services as well as the indirect costs such as transport, and in the case of education, clothing and schoolbooks.
- Intra-household asset ownership. Intra-household inequality and poverty can also be manifest in substantially different allocations of assets by gender and age. Asset ownership in turn can affect and reflect bargaining power within the household and indicate an individual's ability to secure his or her own consumption needs. These survey instruments collect sex-disaggregated data on asset ownership and use, and their likely distribution in the event of divorce or death, as well as the ability to liquidate or transfer assets to others.

⁷ The unitary model or "common preferences" model is based on the notion that either all household members share the same preference function, or that a single decision-maker acts for the good of the entire household. In collective models, on the other hand, different decision-makers within the household have different preferences and household members bargain over the use of resources. The current Poverty Assessment Tools assume a unitary household applying an unweighted per capita consumption measure of poverty that presupposes resources are divided equally among household members.

⁸ Modeling the household decision-making process in this way is equivalent to assuming that there is a shared preference or welfare function which when maximized ensures the optimum welfare of all household members.

Each approach has particular challenges for data collection and analysis. Nutrition intake requirements vary according to the activity rate and age of a given individual. This information would be required in order to use this approach to determine whether a given individual in a household has his/her basic needs met. Anthropometric measurements of data on weight-for-height and height-for-age can yield important information about under-nourishment for children, but are not particularly helpful for an adult population – especially in the presence of obesity and over-nutrition. Investment in health care varies substantially according to the age and health status of an individual. The presence of inequality is not sufficient to determine that a given individual faces a need shortfall – or that he or she is disproportionately likely to be poor. And finally, asset ownership disaggregated by sex and age does not yield information about basic needs insufficiency or current consumption poverty. Furthermore, few children possess and use assets, so this indicator is most relevant for adult members of a household or population.

Inquiry into intra-household poverty and inequality can be quite burdensome: requiring substantial and detailed data that are individually disaggregated on consumption, expenditure, or asset ownership for each household; necessitating well-trained enumerators; and demanding a significant commitment and patience on the part of the interviewee(s). Such an effort is costly in terms of both financial resources and human capital. Furthermore, these disaggregated data have to be carefully and laboriously entered into a statistical package and analyzed. Analysis of intra-household nutrition intake is the most financially costly survey to implement and analyze. These surveys are also the most burdensome for enumerators and interviewees. In contrast, analyses of investment in human capital and asset ownership assessments appear to be less costly.

In appraising the utility of these approaches for the Poverty Assessment Tools, we should consider both the average and marginal costs of undertaking these types of surveys. While investment in health care and asset ownership analyses are potentially among the least costly approaches, the marginal cost of incorporating a sex-disaggregated asset ownership instrument into the Poverty Assessment Tools is likely to be lower than developing an additional health-care investment module.

Key Recommendations

Failing to address intra-household inequality may obscure the fact that some household members are poorer than others. Moreover, it will produce biased and inconsistent assessments of individual poverty. Yet, capturing intra-household and gender-based inequalities in access to household resources is inherently time-consuming and complex, potentially burdensome for enumerators and interviewees, and frequently expensive. Relatively few datasets that explore intra-household inequality exist and no comparative assessments have been undertaken that explore different approaches and determine accuracy at either the household or sample population level.

This report recommends that the following approaches be pilot-tested and compared for accuracy using a modified version of the Poverty Assessment Tools questionnaire in at least four countries where Living Standards Measurement Survey (LSMS) data that include intra-household resource allocation modules exist. This will involve a departure from the current Poverty Assessment Tools approach, since these methods would require estimating the presence of intra-household poverty at the household as well as the sample population level. Additional

questions would need to be incorporated in the Poverty Assessment Tools survey instrument and new estimation techniques deployed to estimate intra-household inequality and poverty. Accuracy should be compared at the household and sample population level. Furthermore, training and technical assistance would need to be provided to ensure that the procedures are being followed correctly and to respond to any concerns or questions that the microenterprise institutions may have.

Separate Budgets and Spheres of Activity

A distinguishing feature of the nature of different productive and allocative priorities within a household can be whether these households engage in joint or separate production and pool or maintain separate budgets for a variety of expenditures. Where separate budgets and spheres of activity exist for significant portions of household expenditure and production, there may be potential for intra-household inequality to prevail.

A number of questions could be integrated into the existing Poverty Assessment Tools questionnaire that ask explicitly about pooled or separate budgets and spheres of activity. These questions should be asked for a range of different spheres of consumption and expenditure decisions.

- Does the household maintain separate budgets for food, clothing, education and health expenditures? If so, who determines and who finances these expenditures?
- Do the principal income earners control the income that they generate?
- Do women/men control the income that they generate? If so, what do they typically spend it on?
- Do women have access to all of the cash income generated by men in the household? If not, to what percentage do they have access?
- Do men have access to all of the cash income generated by women in the household? If not, to what percentage do they have access?

Where separate budgets and spheres of activity exist there may be sufficient evidence for the potential for intra-household inequality. These households should be surveyed for additional indications of intra-household inequality and poverty.

Asset Ownership

The existence of uneven asset ownership within a household can also indicate other intra-household inequalities in consumption and wellbeing. Current assets are used in the Poverty Assessment Tools to predict current per capita expenditures and determine poverty rates. Consequently, collecting data on key assets and tracking who owns and controls these assets could allow for a more detailed and disaggregated picture of individual vulnerability to poverty or ability to withstand income and consumption shocks. This could be undertaken only for those households where separate budgets and spheres of economic activity have been established since these households are more likely to manifest intra-household inequality.

The assets to be considered should reflect those already established by the Poverty Assessment Tools project in the four broad categories: education, housing, consumer durables, and agricultural and financial assets.

Weighting for Individual Needs

Another approach that incorporates the potential for intra-household inequality is to undertake a series of individual needs adjustments or weighting for a subset of households where it has been established that separate budgets and spheres of activity exist. This could be done using an Individual Needs Matrix for all adult household members and their dependents. The Individual Needs Matrix would allow us to ask those adults in households where there is the potential for intra-household inequality whether they or their children and dependents have faced shortfalls meeting their basic needs for food, clothing, education, health expenditures, etc. The potential needs of these household members would then be assessed using a country-specific scale that combined the caloric requirements and health-care needs of adults and children, as well as the sick and healthy, and developed a needs equivalence scale or individual needs weighting.

I. INTRODUCTION

As part of a Congressional mandate in the 2003 Amendment to the Microenterprise for Self-Reliance Act of 2000, USAID is responsible for developing accurate, low-cost methods for poverty assessment to be used by microenterprise programs:

“The Administrator of the United States Agency for International Development, in consultation with microenterprise institutions and other appropriate organizations, shall develop no fewer than two low-cost methods for partner institutions to use to assess the poverty levels of their current or prospective clients.

The United States Agency for International Development shall develop poverty indicators that correlate with the circumstances of the very poor.

The Administrator shall field-test the methods developed under subparagraph (A). As part of the testing, institutions and programs may use the methods on a voluntary basis to demonstrate their ability to reach the very poor.”⁹

The mandate from the United States Congress specifically calls for methods that can be used by microenterprise practitioners to assess to what extent they reach the very poor.⁹ To this end, the Center for Institutional Reform and the Informal Sector (IRIS Center) at the University of Maryland was contracted by the United States Agency for International Development (USAID) to develop and field test poverty assessment tools for use by institutions providing microenterprise assistance. IRIS has undertaken a series of accuracy tests of poverty indicators using two datasets, the Living Standards Measurement Survey (LSMS) datasets for Albania, Ghana, Guatemala, India (Bihar and Uttar Pradesh only), Jamaica, Madagascar, Tajikistan, and Vietnam and a primary dataset collected by IRIS in Bangladesh, Peru, Uganda and Kazakhstan. Additional information on the tools and their development can be found at www.povertytools.org.

The USAID Microenterprise Development office requested technical assistance from the USAID Office of Women in Development, through its contractor DevTech Systems, to work with the IRIS Center to take account of the effects of gender differences in the construction and application of the tools. This report, which focuses on the consideration of gender in the design of the Poverty Assessment Tools, complements the work being undertaken by IRIS and provides

⁹ According to the Microenterprise Results and Accountability Act of 2004 (Public Law 108-31), the term ‘very poor’ means individuals— “(A) living in the bottom 50 percent below the poverty line established by the national government of the country in which those individuals live; or “(B) living on the equivalent of less than \$1 per day” adjusted for purchasing power parity. We refer to very poor and not very poor households to reflect that many households served by microfinance and microenterprise development institutions command limited resources. This applies the poverty lines required by the microenterprise law which define the very poor as those living in the bottom 50 percent below the national poverty line or on less than US\$1 per person per day. These international poverty lines are based on purchasing power parity (PPP). The original \$1/day poverty line was constructed based on 1985 PPP estimates. Since its inception, the international poverty line has been updated and is currently defined as the mean of the 10 lowest national poverty lines using 1993 PPP exchange rates. Therefore, the “\$1/day” poverty line actually equals \$1.08/day in 1993 PPP terms and the upper international poverty line, or “\$2/day” poverty line, is simply twice the \$1/day poverty line

additional recommendations for how these poverty tools may be adapted to assess the presence of intra-household poverty and inequality.

The objective of this report is to draw attention to the presence of intra-household inequality. Households are aggregations of individuals who may act cooperatively or competitively when generating and using resources such as income or accessing assets such as land and financial wealth. It is clear that not all households share resources and assets equally and that some members may be relatively more privileged than others, commanding more income and accessing greater consumption opportunities. Where this is the case, some members of a household may be more likely to be very poor than others. There is also evidence that intra-household inequality and poverty may disproportionately affect women, children and the aged.

The report constitutes a preliminary assessment of gender-sensitive intra-household poverty tools and provides recommendations for further research and pilot-testing to develop such tools.

Most measures of household poverty assume that all resources that enter the household are shared equally. Consequently, taking income or consumption and dividing it by the total number of individuals in a household yields a measure of approximate per capita resources available to each individual. This measure is then compared to a poverty line to determine whether the household is poor or non-poor. If the per capita measure of resources available to an individual within the household is higher than the chosen poverty line, then the household is determined to be non-poor.

This approach, however, assumes that the household is unitary¹⁰, that decisions about the allocation of resources within the household can be modeled as if there were a single, neutral decision-maker.¹¹ But if households are not unitary, and individuals compete for resources, then not all members of a household are likely to be equally poor or equally well-off. Households that have been determined to be very poor or not very poor using the predicted consumption measures derived from the poverty assessment tools analysis may contain members who do not command equivalent resources. Some of these household members may in fact be very poor themselves while others may not. Establishing that a household is not very poor is neither necessary nor sufficient to ensure that all members of that household are not very poor and vice versa.

This report addresses the issues that affect the measurement of individual poverty flowing from the concern about intra-household inequality, and the possibility that not all members of a household command the same set of resources.

¹⁰ The unitary model or "common preferences" model is based on the notion that either all household members share the same preference function, or that a single decision-maker acts for the good of the entire household. In collective models, on the other hand, different decision-makers within the household have different preferences and household members bargain over the use of resources. The current Poverty Assessment Tools assume a unitary household applying an unweighted per capita consumption measure of poverty that presupposes resources are divided equally among household members.

¹¹ Modeling the household decision-making process in this way is equivalent to assuming that there is a shared preference or welfare function which when maximized ensures the optimum welfare of all household members.

I.1. Objectives

In concert with the objectives established for the IRIS Poverty Assessment Tools project, this report aims to complete the following:

- undertake a selective review of the literature on measuring intra-household inequality;
- provide a critical assessment of the existing literature's ability to measure intra-household dynamics accurately and at low cost; and,
- identify potential approaches for practical, applicable measures that could augment the existing Poverty Assessment Tools instruments to address intra-household inequality and poverty.

I.2 Structure of the Report

This report undertakes a selective review of intra-household inequality focusing explicitly on the implications for poverty measurement. The review is not exhaustive but focuses on those techniques and approaches that may be modified or applied to augment the existing Poverty Assessment Tools instruments to address intra-household inequality and poverty. Section 2 describes some of the existing tools for intra-household poverty analysis highlighting the analysis of consumption and nutrition inequalities, inequalities in investment in human capital, and inequalities in asset ownership. This section also discusses the implications of these analyses for the Poverty Assessment Tools. Section 3 develops the basis for some simple tools that could be applied by the microfinance and microenterprise development¹² institutions for intra-household poverty analysis, discussing separate or pooled budgets and spheres of activity, weighting and adult equivalence, subsistence production, seasonality and shocks, as well as time poverty. Finally, Section 4 provides recommendations for a series of potential approaches for modifying the Poverty Assessment Tools to address intra-household inequality and poverty in accordance with the 2003 Congressional mandate. These approaches would need to be further refined and pilot-tested to gauge their cost and accuracy.

¹² Microfinance and microenterprise development institutions provide financial as well as non-financial services to support poor households and microenterprises.

2. A CRITICAL REVIEW OF INTRA-HOUSEHOLD INEQUALITY

Gary Becker was among the first theorists to develop an economics of the family and the household in the mid-1960s.ⁱⁱ Becker modeled the household as an aggregation of individuals whose wishes could be described by a single set of preferences. According to Becker, the household combined time, goods purchased in the market, and goods produced at home to produce commodities that generated utility¹³ for the household.ⁱⁱⁱ

In the analysis of households in developing countries, and in particular in agricultural households, many economists have followed Becker's approach. Singh, Squire and Strauss (1986) build upon Becker's work and develop a model of the household that jointly motivates both production and consumption decisions. Similar work by Low (1986) also draws on Becker but explores semi-subsistence households where household members each have a different potential for earning wage income. Low specifies a model where some household members have a greater comparative advantage in wage work than do others. As a result of this assumption, the amount of labor that the household chooses to commit to subsistence food production depends not only on the farm-gate price of output,¹⁴ but also on the ratio of wages to the retail price of purchased food. Optimal decisions are made considering the total available labor hours for all potential workers and choosing who should engage in off-farm work and who should be committed to subsistence production.

A common feature of these models is that they are "unitary": the household members exhibit common preferences and act as one in all decision-making concerning production and consumption. The household optimizes the use of resources and everyone is assumed to be in agreement. The unitary model rests on the assumption that there exists a "parental, or household, welfare function¹⁵ and that all resources – capital, labor, land, and information – are pooled."^{iv}

Attempts to nuance the unitary model have led to the development of a household welfare function that aggregates the preferences of different individuals – allowing each individual to value different distributions of resources or allocations of labor effort within the household. Notwithstanding, these models still posit an ultimate consensus about the allocation of resources according to these aggregated preferences.

A series of bargaining models also emerged in the development literature that describe households as a collection of individuals each of whom may have separate tastes and preferences. In some models, individuals have different abilities to influence outcomes within the household. Interactions are modeled as bargains. These bargaining models belong to what are termed "collective" models in the literature because they are distinct from the "unitary" approach to motivating household behavior.

¹³ Utility is an economic concept that summarizes the pleasure or satisfaction derived by an individual from being in a particular situation or from consuming goods or services. No single measure of utility exists, but it is assumed that by their choices of the combinations of available commodities that consumers reveal what it is that generates utility for them.

¹⁴ The price at which they can sell their produce to intermediaries.

¹⁵ In this context the welfare function is a function that aggregates the individual utility functions to derive a joint locus to maximize that reflects the preferences of the entire household.

But what does this mean in practice? The struggle to define and motivate household behavior responds to the fact that not all household members may have access to the same resources or command the same level of wellbeing. An extreme example of this is the phenomenon of missing girls in parts of East and South Asia. As the World Bank (2006) observes, “Gender inequity causes many societies to display some preference for male children.”¹⁶ This “son preference” is sufficiently strong to result in excess female child mortality in some parts of the world. For example, in China and India selective infanticide has been practiced for several centuries resulting in higher than average proportions of male to female children under 4 years of age. In the Punjab and Haryana in India, Das Gupta et al (2003) report that there were almost 1.25 boys for every girl under 4 years of age.

Infanticide is hard to document and verify, but it is also likely to be rare. Yet the sex ratios in parts of Asia indicate that more male children are being born and surviving than female children. The rapid diffusion of fairly low-technology means of verifying the sex of a fetus in the womb, such as sonograms, has facilitated sex-selective abortions and is likely to contribute to a deficit of female children in parts of India and China. Finally, neglect, or sex-selective nurturing practices, can also contribute to higher mortality rates for girls than boys during early childhood.

Although this example is extreme, it illustrates a concern that the welfare and wellbeing of all members in a household may not be equal. Where the desire not to channel resources to young girls results in mortality, this means that they do not appear in either the numerator or the denominator of the poverty head-count ratio. The existence of intra-household inequality implies that resources are allocated unevenly and reveals that choices about access to these resources are being made that favor some household members over others. The motivation for this inequality may vary, but its existence also implies that some household members may be poorer than others. Across continents and cultures, households may make decisions that privilege income earners over non-income earners, the young over the old, boys over girls, and the healthy over the infirm. Development practitioners should take this into account when they are measuring household-level welfare and wellbeing for the purposes of targeting or evaluation.

2.1. Implications for Poverty Measurement

The existence of intra-household inequality has significant implications for the measurement of poverty and wellbeing. If not all members of a household are equally well-off then we will confront two types of measurement error when we define household level poverty rates. If we determine that the mean per capita income or consumption of a household is sufficient to bring that household above a particular poverty line, we assume that all members in the household are not very poor. But if some members of that household consume more resources than others, they may not be very poor, while other members of the household will command insufficient resources to lift them above the poverty line. In statistical terminology this is known as a false negative or a Type II error.¹⁷ The other misdiagnosis of concern occurs in households that we have defined as poor. If some members of the household command more than the mean per capita income or consumption then they are not very poor, while others are very poor. This scenario describes a false positive, or Type I error.

¹⁶ See Box 2.9 “Sex ratios and “missing women” in World Bank Equity and Development, World Development Report 2006, pp51.

¹⁷ This assumes that the null hypothesis H_0 is that an individual is very poor under the definition of poverty being applied.

Table I. Errors Associated with Mean Per Capita Poverty Measures in the Face of Intra-household Inequality

Actual Individual Intra-Household Consumption Measure	Mean Per Capita Measure	
	Very Poor	Not Very Poor
Very Poor	Correct	Type II Error
Not Very Poor	Type I Error	Correct

In addition to the likely measurement error associated with not taking intra-household inequality into account when measuring poverty, there are two other related concerns associated with the **depth** and the **severity** of poverty. The depth of poverty gives the analyst a measure of the proportion by which that individual or household is below the poverty line. The severity of poverty captures the gradient or steepness of the cumulative distribution of individuals or households that fall below the poverty line. Measures of the depth and severity of poverty provide the analyst with information about the extent of poverty as well as the potential cost of mitigating poverty.

The headcount measure of poverty gives the proportion of households whose per capita income falls below an established poverty line. A simple headcount of who is poor yields the same measure of poverty whether the poor are just below the poverty line or substantially below that line. The depth of poverty refers to how close or far from the poverty line households fall.

One measure of the depth of poverty is given by the poverty gap. This represents the average shortfall of per capita income or consumption below the poverty line for all households. Some households have a poverty gap of zero, because their income or consumption is above the poverty line, while others have a poverty gap of non-zero because their income or consumption falls below the poverty line.

The poverty gap can be interpreted as a per capita measure of the total shortfall of household welfare below the poverty line. It is the sum of all the shortfalls, non-zero and zero, divided by the total number of households and expressed as a ratio of the poverty line.

Finally, the poverty gap squared is used as a measure of the severity of poverty. The severity of poverty is a poverty measure which is sensitive to the income distribution among the poor – the more unequal this distribution the more severe is poverty.

The relevance of these different measures of the depth and severity of poverty is that where there is income or consumption inequality, the extent of this inequality is important. These inequalities are not only relevant for comparisons of households that are determined to be very poor or not very poor, but also for intra-household comparisons. Within a given household, if average per capita consumption does not correspond to actual per person consumption, then very poor and not very poor individuals may coexist in the same household. This has implications for development policy since transfers to that household, or increments in income accruing to that household, may not benefit all members equally, or compensate for the consumption shortfalls of all members.

If data existed on each individual's consumption within the household – and the expenditures and costs associated with securing this level of consumption – we could calculate each of these measures for every individual household member. This would allow us to demonstrate that

even in households that were determined to be not very poor, some members may command consumption shares that fall below the poverty line, and that transfers to these households may not necessarily lift all members above this poverty line. Similarly, we may also be able to show that in households deemed to be poor, some members command consumption shares that lift them above the poverty line. Unfortunately, such data seldom exist and are quite burdensome and costly to collect and analyze.

2.2. Existing Methods and Data Requirements

A number of methods exist to try and gauge intra-household inequality. Most prominently, consumption and nutrition data have been used to ascertain who commands more resources within the household. Similar approaches have been undertaken with investment in human capital and expenditures on education and health care. Finally, a body of research has focused on asset ownership and title to productive resources such as land, financial capital, machinery, and housing.

The LSMS conducted by the World Bank in collaboration with national statistical agencies provides a rich source of data for these types of analyses. Many of the analyses reported below utilize these datasets or national survey instruments that have been modeled on the LSMS. Unfortunately, the LSMS and similar surveys are not available for all developing countries across all years.¹⁸ Moreover, replicating these types of surveys is likely to be prohibitive for many of the microfinance and microenterprise institutions engaged in applying the poverty tools assessment.

2.2.1. Consumption and Nutrition

The majority of studies that explore the intra-household distribution of food use anthropometric¹⁹ indicators such as weight-for-age and height-for-age. These indicators have been standardized by measurements from an appropriate and healthy reference population. Other studies rely on the nutrient intakes of individuals and attempt to assess whether these meet established requirements for wellbeing.

Using survey data on family health and nutrition in Brazil, Thomas (1990) finds that parents' individual unearned income is associated with larger positive effects on the nutritional status of children of their same gender, that is, mothers invest more in daughters and fathers invest more in sons. Furthermore, Thomas documents that income in the hands of a mother has a larger effect on the family's health and wellbeing than income in the hands of a father. The study deploys a variety of indicators of health and wellbeing. At the household level, the author considers nutritional intake in the form of calories and protein. For each woman who has ever borne a child, the author explores the determinants of fertility and child survival. And finally, the author considers anthropometric data on wasting (weight conditional on height) and stunting (height conditional on age).²⁰

¹⁸ See [Appendix I, Table I](#) for a description of the LSMS datasets and their different modules.

¹⁹ Anthropometry is the study of human body measurement for use in anthropological classification and comparison.

²⁰ Among nutritionists, child height-for-age is considered to be a long-run measure of nutritional status and weight-for-height a shorter-run indicator.

Duncan used the Brazilian household survey, Estudio Nacional de Despesa Familiar (ENDEF), which consists of a nationally representative random sample of 55,000 households that has a comprehensive income, expenditure and demographic survey. In addition to the detailed information on household expenditures, a team of enumerators collected data on the amount of food consumed by the household during seven consecutive 24-hour periods. This information was converted into an estimate for mean per capita nutrition intake, taking account of wastage. Additionally, each household member was asked about their own earned and un-earned income including all transfers, benefits, pensions, rental income, income from assets, as well as gifts and irregular income. Information on children ever born to each woman of reproductive age and the numbers who had survived until the survey date was also recorded. Finally, anthropometric data were collected for children younger than 8 years of age.

Thomas uses these data to explore the type of decision-making that prevails within the household. Under a model of common preferences of all household members or “perfect altruism,” the distribution of income within the household should have no impact on household consumption and investment patterns. Yet, clearly this is not the case. Income in the hands of women is associated with a larger increase in the share of the household budget devoted to human capital (household services, health, nutrition, and education) as well as leisure goods. Furthermore, nutrient intake rises faster with increases in women’s income. Moreover, maternal income has a significantly larger effect on weight-for-height and height-for-age of children than paternal income.

Park and Rukumnuaykit (2004) also explore gender bias²¹ in intra-household resource allocation using nutrition data. The authors use data from the 1991 and 1993 waves of the China Health and Nutrition Survey (CHNS) administered by the Population Center at the University of North Carolina at Chapel Hill. A unique feature of the CHNS is the collection of individual nutrient consumption data for each member of the households surveyed based on intensive three-day food intake surveys conducted by trained health personnel.

Park and Rukumnuaykit develop a model of intra-household inequality that explores parental and child nutrient intake. They set out to test whether the effect of an additional son on the consumption of adults differs from the effect of an additional daughter by examining fathers’ and mothers’ consumption of calories, protein, and fat as well as child nutrient intake. When an additional child becomes part of a household this places new demands on existing household resources. If total expenditures remain constant, other household members must sacrifice their own consumption for the sake of the new child. Who sacrifices his or her consumption and how much consumption he or she sacrifices may depend on the sex of the parent and the sex of the new child. Park and Rukumnuaykit estimate an empirical model of the father’s or mother’s food consumption share as a function of total household consumption, household size and composition – differentiating children by age and sex, and including a series of individual control variables that capture the age and education level of the parent. They estimate the responsiveness of the father’s or mother’s consumption with respect to boys or girls in different age cohorts.²²

²¹ Park and Rukumnuaykit define gender bias broadly to be any difference in household resource allocation associated with characteristics that differ by gender.

²² Park and Rukumnuaykit apply a version of the outlay equivalence method that was proposed by Deaton (1989) to test for the effect of additional children of different sexes on parental consumption. Deaton’s test examines whether the reduction in expenditures on “adult goods” (e.g. makeup, tobacco, liquor, jewelry, and adult clothing) differs when children are boys rather than girls. In this study, Park and Rukumnuaykit use the nutrient intake of fathers and mothers as adult goods.

Park and Rukumnuaykit find strong evidence of gender bias in fathers' calorie consumption, especially among rural households. The negative impact on the father's consumption shares of an additional boy is greater than that of an additional girl. This finding holds for all age groups except the youngest age group, and the difference is statistically significantly different than zero at the 99 percent confidence level. In contrast, the authors find no strong evidence of gender bias in mothers' calorie consumption for the rural sample. The reduction in the mother's consumption is the same if the child is a boy or a girl. The same is broadly true for protein as well as fat consumption.

Unfortunately, nutrient intake analysis is difficult to conduct. Not only does such an analysis require highly detailed data collection and is time-consuming and costly; it is also methodologically challenging. Bouis and Peña (1997) highlight some problems with measurement of intra-household inequality using food consumption data. They note that "if all individuals required identical amounts of nutrients regardless of age, gender, physiology, and activity pattern, and if all individuals had identical taste preferences and knowledge of their nutritional requirements, it would be relatively simple to measure inequality in the intra-household distribution of foods."^v Yet none of these conditions usually holds. There is significant variation in the calories and nutrition required for an adult or a child, for a pregnant woman or an octogenarian. An office worker may require fewer calories than a farm worker and those living at altitude in cooler climates more calories than those who live at sea level in warm climates.

Most attempts to gauge intra-household inequality using nutrition indicators have used calorie intake corrected for differences in caloric requirements due to age, sex, weight, pregnancy or lactation, and activity patterns. Unfortunately, recommended calorie intakes for these various criteria are still the subject of considerable debate. When evaluating the adequacy of nutrition intake, it is critical that the analyst control for differences in energy needs between individuals.²³ Unfortunately, the methodology is undergoing constant revision and refinement. Controversy prevails in the literature about selecting those factors influencing energy needs which should be incorporated into the calculation of Recommended Daily Allowances (RDAs). Furthermore, some of the information is difficult to measure such as activity patterns. The failure to take account of differences in activity patterns could lead to the erroneous conclusion that an individual is over-nourished when in fact he or she is consuming additional calories required for sustenance while undertaking heavy manual labor.²⁴ Finally, even when the relevant criteria are accurately taken into account, calorie adequacy is a theoretical measure of whether an individual has his or her caloric needs met, and not an actual measure. Significant measurement error may exist. Moreover, the quality of the foods consumed can affect both nutritional content and energetic yield.

Another concern that is raised about the nutritional intake approach is that basic necessities may be more equitably distributed than luxury items.^{vi} Consequently, calorie intake, a necessity, is likely to be a rather insensitive empirical measure of intra-household inequality when

²³ Partha Dasgupta (1993:412) cites the World Health Organization (1985:12) which defines energy requirements as "the level of energy intake from food that will balance energy expenditure when the individual has a body size and composition, and level of physical activity, consistent with long-term good health; and that will allow for the maintenance of economically necessary and socially desirable physical activity."

²⁴ Similarly, basal metabolism also plays a role in the absorption of nutrients and varies considerably across individuals. Metabolism is reflected partly in the individual's endowments, but also can be affected by nutrient intake. This endogeneity complicates any analysis of nutrient intakes and health outcomes.

compared with the consumption of foods with higher income elasticities²⁵ such as non-staple items and luxury items.

It is clear that both anthropometric and nutritional intake analyses present difficulties. Firstly, the use of anthropometry assumes that low weights and heights are primarily the result of poor nutrition. Yet, substandard growth can be the result of factors other than undernourishment such as inadequate health care, illness, and unsanitary living conditions.²⁶ Secondly, the reference population chosen should be representative of the population under study, but frequently this is not the case. Often, no studies of a reference population exist. For example, highland migrants to the cities in Latin America are frequently from indigenous groups who cannot be compared physiologically to urban populations since there may be significant differences in weight and height because of generations of habituation to a different environment, lifestyle and diet. Furthermore, these local standards need to be disaggregated by sex. Populations where there has been systematic gender discrimination over time will produce standardized means that may lead to under-estimates of gender bias. Thirdly, anthropometry fails to take into account reductions in levels of activity – which can be a result of poor nutrition or health – and affects growth as well as nutritional requirements.

In addition to the conceptual concerns, there are empirical difficulties associated with the collection and measurement of data. To gain a full understanding of nutrient intake over time, researchers would need to collect seasonal data using on-site observations or “normal” food consumption behavior per person over time. Feasting and fasting, which may be integral activities across many cultures and continents, are considered abnormal events by nutritionists. Consequently, observation must take place over a sufficient period so as not to be distorted by such events. Food allocations can be assessed by recall or weight. Most recall datasets focus on a 24-hour period and rely on interviewees recalling what and how much they consumed. Other approaches include weighing the raw ingredients or cooked food using standardized weights of known volumes used at each site.

Clearly, there is much opportunity for measurement error to occur. People may forget or omit certain foods or snacks consumed – either because of poor memory, or because these foods are prohibited or considered unacceptable. Another type of measurement error that can occur is a result of systematic biases that can be introduced in reported food consumption. Individuals typically adhere to normative expectations about food consumption. If local norms uphold that older males should be favored, for example, or that certain foods should be reserved for particular household members, then the allocations reported by key respondents are likely to be biased towards these norms.^{vii} Additional complications are presented by the fact that certain foods cannot be weighed and only approximate estimates of the amount consumed can be given. This is the case for breast milk, which is typically measured by the time spent nursing, although quantity and quality of breast milk can vary substantially depending on the age and health of the mother. Other errors can be introduced in estimating the appropriate conversion factors between raw and cooked foods, in the classification of ingredients, and in nutrient absorption and digestibility.²⁷ Moreover, individuals who are being observed may alter their behavior. As

²⁵ The income elasticity of demand measures the responsiveness of the quantity demanded of a good to the income of the individual or household consuming the good. The consumption of goods with higher income elasticity is sensitive to changes in income.

²⁶ A high parasite burden, or diarrhea, for example can affect growth. See Partha Dasgupta “Food Needs and Work Capacity.” 1993.

²⁷ For example, individuals with a high parasite burden may not get all the nutrients they consume.

Harris-White notes: “There is widely alleged to be a trade-off between efforts to obtain high precision and modifications to behavior on account of being observed.”^{viii}

Collecting nutrient intake data requires a complex survey instrument, well-trained enumerators and ample time and resources. Typically, this type of analysis is both time-intensive and burdensome requiring substantial commitment and focus on the part of the enumerator as well as the interviewees. Households must also agree to participate and submit to direct observation, or consent to substantial periods of time spent being interviewed. Data have to be collected at the individual level on food and nutrition consumption and/or expenditures. Relying on individual or key informant recall means that the data are likely to be subject to measurement error. Yet even direct observation or weighing food prior to consumption may introduce measurement error as caloric or nutrient conversions may be inaccurate. Finally, observation may itself change behavior and cause actual allocations to deviate from their usual or unobserved allocations. Moreover, this type of approach is likely to be prohibitively expensive and difficult to implement for the microfinance and microenterprise institutions that will be required to conduct and analyze the survey.

2.2.2. Investment in Human Capital

The development literature also focuses on intra-household inequality in investments in human capital, most notably health care and education.²⁸

Alderman and Gertler (1997) explore the intra-household distribution of family resources examining the demand for children’s medical care in Pakistan. These authors develop a theoretical model of household resource allocation that under certain circumstances demonstrates son preference – motivating higher investments in medical care for sons. Testing their model using data from Pakistan, they find that poorer families invest less in daughters relative to sons, and that the difference in gender discrimination between wealthier and poorer households rises as the price of human capital investments also rises. The price elasticity of demand for female health care is more elastic than the demand for male care at lower income levels. That is the proportionate change in the demand for female health-care for a given change in price of that health care is greater than for boys, and more so for lower income families. In the lowest income group, the absolute value of the price elasticity for doctor’s services is 58 percent larger for females than for males. The corresponding percentage difference is only 14 percent for the highest income group. The relative magnitude of price responsiveness for female and male children was similar for traditional healers and pharmacists as for the clinics that the government provides. Additionally, Alderman and Gertler found that there was a consistent tendency to use higher-quality providers (mostly private doctors) more frequently for boys than for girls.

The data for the study came from a 1986 survey of households in five low-income districts throughout Pakistan. Careful attention was paid to gathering information about all members of the household observing cultural norms and dictates. Female enumerators interviewed female household members and male enumerators interviewed male members of household. Data were

²⁸ This report does not discuss investment in education since it does not relate directly to consumption poverty. For an in-depth analysis of intra-household inequality in education expenditures see Agnes Quisumbing and John Maluccio “Resources at Marriage and Intrahousehold Allocation: Evidence from Bangladesh, Ethiopia, Indonesia, and South Africa,” 2003, and Yamauchi, Futoshi “Early Childhood Nutrition, School, and Sibling Inequality in a Dynamic Context.” IFPRI. 2006.

recorded on illness by type²⁹ and the medical care used during the preceding two weeks for each child five years of age or under. Data were also collected on the availability of medical care, the associated costs for treatment and medication, and the distances from, and travel time to, particular types of medical services. The researchers identified and inquired about four distinct types of health-care services in addition to self-care: private physicians, pharmacists, government clinics, and traditional healers.

Additionally, data were collected on household and individual assets. The asset data were then used to predict household incomes to derive a measure of permanent income.³⁰ It was this permanent income that was used to define the different income groups and to explore the responsiveness of demand for health care to changes in income and prices. These assets included land owned (either irrigated or rain-fed), orchards, livestock, vehicles and machinery.

Hallman (2000) conducted a similar study of gender differences in health outcomes in Bangladesh. This study examines the effects of assets and wealth holdings on the morbidity of preschool boys and girls in rural Bangladesh.³¹ In particular, Hallman explores the impact of (1) current individual parental assets, (2) assets held by each parent before marriage, (3) transfers made at the time of the parents' marriage, and (4) the family background characteristics of parents. Hallman simultaneously tests alternative models of household decision-making and investigates gender bias within the household.

Hallman finds that the father's share of current assets benefits boys' health, but does not appear to affect girls' health. Controlling for the value of current household assets per capita, a higher share of current assets held by the father reduces the number of reported illness days for boys, while a higher share for the mother reduces the number of reported illness days for girls. Current asset ownership shares do not appear to have a statistically significant effect on girl-child morbidity; however, greater household wealth may reduce slightly the number of sickness days experienced by girls. A greater proportion of pre-wedding assets held by the mother lowers the number of morbidity days experienced by girls. Furthermore, a larger share of wedding payments transferred to the husband's side of the family at the time of marriage reduces illness for preschoolers of both sexes later in the union. Interestingly, the characteristics of the extended family of each parent, which have been found elsewhere to strongly influence the assets held by Bangladeshi husbands and wives, also have significant effects on child health. Living brothers of both parents are particularly beneficial, and especially for girl children in the marriage. Hallman concludes that this result is consistent with longstanding cultural norms of daughter transference of inherited land to her brothers in exchange for future brotherly support of her and her children.

Hallman also concludes that policies that help increase the share of household resources held by women could have beneficial effects for girls' health in rural Bangladesh. Hallman notes, "Moreover, a higher degree of female command over household wealth may encourage parents in subsequent generations to invest more in daughters." In Hallman's estimation, compounding

²⁹ The researchers focused on acute morbidity and excluded cases of trauma, surgery, and chronic illness.

³⁰ Milton Friedman observed that consumers typically smooth their consumption in the face of income fluctuations by borrowing or drawing-down savings. If, for example, someone's income varies between zero and \$10,000 per annum averaging \$5,000, a consumer will typically spend an average of \$5,000 per year. The individual's permanent income is therefore considered to be \$5,000 per year. Under circumstances where the marginal utility of money declines with increasing increments of spending, it is rational to transfer spending from surplus periods to lean periods, saving in some periods and "dissaving" in others. The field of microfinance documents this phenomenon widely. See for example Stuart Rutherford, *The Poor and Their Money*, 2001.

³¹ Morbidity was measured as the number of illness days in the two weeks preceding the household survey.

factors that both affect and respond to gender discrimination are that current patrilineal inheritance patterns cause parents to favor sons over daughters – sons are seen as better economic assets and old age security than daughters, who have limited inheritance rights and who leave their natal households upon marriage.

Data collection for this research was intensive. The survey team conducted a four-round survey that collected detailed information on households and their individual members' activities in agricultural production, other income-earning activities, as well as expenditure patterns, time allocation, nutrient intakes, and nutrition, micronutrient, and morbidity status. Family background data were collected individually from husbands and wives in the second survey round. Both men and women were asked about their own and their parents' education, as well as their own marriage history, premarital assets, and inheritance; women were questioned about transfers at marriage and indicators of their mobility (their ability to leave the house, to work and travel beyond the family compound) as well as other indicators of empowerment or bargaining power. Data on short-term morbidity over the last 14 days were collected for each individual by interviewing a principal female respondent. The data included information on the type of ailment and the duration of sickness.

While such an approach can yield important information with which to analyze intra-household resource allocation, it requires detailed and disaggregated data on health outcomes and health expenditures for all members of the household. This type of approach will provide limited information about whether or not a particular individual within a household may be vulnerable to poverty. Observing unequal health outcomes and health-seeking behavior or expenditures may not be indicative of a given individual's vulnerability to intra-household inequality. One individual may be healthier than another and require fewer resources to maintain his or her health. Health status alone is also not indicative of expenditure poverty status. Moreover, the data collection can be expensive and burdensome for the enumerators and households being interviewed.

2.2.3. Intra-Household Asset Ownership

Intra-household inequality and poverty can also be manifest in substantially different allocations of assets. Asset ownership in turn can affect and reflect bargaining power within the household and be indicative of an individual's ability to secure his or her own consumption needs. Fafchamps and Quisumbing (2001) investigate how the control and devolution of productive assets are allocated among husband and wife. These authors follow a standard game-theoretic bargaining model, where theory predicts that bargaining power within marriage depends on the division of assets upon divorce (conceiving of this as the “exit option”) and on control over assets during marriage (following a non-cooperative bargaining approach).³² In many empirical analyses, bargaining power is proxied by variables such as bride or groom payments, assets brought to marriage, and ownership of assets within marriage.^{ix}

Measuring assets brought into a household may appear simple. Establishing who purchased, owns and controls these assets, however, can be quite complicated. We draw on an example from Ethiopia to demonstrate how complex the task of measuring the ownership and control

³² Non-cooperative bargaining is characterized by each agent choosing a strategy in order to achieve his or her goals with the knowledge that other agents will respond to their strategic choice by maximizing their welfare in order to achieve their interests.

over assets can be. Using sex-disaggregated household data from rural Ethiopia, Fafchamps and Quisumbing demonstrate that assets brought to marriage, ownership of assets, control within marriage, and their disposition upon death or divorce, are only partly related.

In rural Ethiopia, control over productive resources is centralized in the hands of the primary household head, be it a man or a woman, irrespective of ownership of assets at or after marriage. Disposition of assets upon death or divorce only loosely depends on individual ownership during marriage. Control over assets during marriage is associated with larger claims over these assets upon divorce. The ownership of assets brought into marriage has little impact on their disposition upon death, but can matter in the case of divorce. In particular, Fafchamps and Quisumbing found that women who own more of the household assets expect to get more of the household land and livestock upon divorce. The fate of women after marriage, therefore, depends on the control they can exert over assets during marriage.

The sample frame used for the analysis was derived from the 1997 Ethiopian Rural Household Survey (ERHS) which was undertaken by the Department of Economics of Addis Ababa University (AAU), in collaboration with the International Food Policy Research Institute (IFPRI) and the Center for the Study of African Economies (CSAE) of Oxford University. Four rounds of survey questions were conducted that gathered data on consumption expenditures, wealth, asset ownership, income, and health, as well as approximately 9,000 individual anthropometric measurements. A variety of assets brought to the marriage were recorded, as well as all transfers made to the household at the time of marriage.

The authors find that the majority of a new couple's assets are brought by the newlyweds themselves, with grooms bringing more than 10 times as much start-up capital as brides. Assets brought to marriage vary dramatically among couples, however, with a median of zero for most asset categories except livestock and jewelry, clothing and linens.

Inequalities in inheritance patterns are equally pronounced. Land and livestock that are inherited after marriage come primarily from the husband's family. Daughters very rarely inherit anything from their parents. Furthermore, when examining land-use rights held by the household, two-thirds of usufruct rights are allocated by peasant collectives known as Peasant Associations and are in fact common property rights determined by the community. Of the land that comes from the family, however, most ultimately comes from the husband's parents.

After marriage, control over finances and productive assets becomes centralized in the hands of the household head, while disposition upon divorce or death generally follows equal division, except in the case of land holdings.

Decision-making within marriage is complex and demonstrates distinct realms where one individual may exert exclusive control and/or where shared or joint control over the use and disposition of assets is maintained. For example, even though most animals are owned jointly, the right to sell livestock and to keep the proceeds of the sale predominantly falls in the hands of the household head – whether that head be a man or a woman. The only exception is the right to keep money generated from the sale of dairy products such as milk, butter, cheese, and eggs, a right that disproportionately accrues to women.

Respondents were asked how they expected various assets to be divided upon death or divorce. Half of the monogamous households surveyed expected the land and house to go to the husband upon divorce; another 40 percent expected landholdings to be divided equally between

husband and wife. The general rule for livestock as an equal division between husband and wife, irrespective of whether the livestock was owned jointly or individually by the husband and the wife. Individually owned livestock, however, was more likely to be attributed to its owner upon divorce.³³

Upon the death of the household head, assets are most likely to go to the surviving spouse, together with child custody. Children inherit in less than half the cases, and when they do, it is usually together with their mother. However, regional and ethnic variations in inheritance rights prevailed and the allocation of assets varied substantially by location and racial group. This latter finding underscores the importance of social norms and dictates in shaping asset allocations.

Although an asset ownership analysis may illuminate the potential for intra-household inequality and poverty, it is frequently difficult to conduct. A variety of methodological and data collection issues hamper the analysis. As Fafchamps and Quisumbing (2001:4) observe, “assets brought into marriage are often regarded as individually owned and controlled and as inherited or taken back upon divorce. In practice, however, patrimonial law seldom if ever functions this way... assets brought to marriage are often held in common, and the management of productive assets is dissociated from ownership.”

Social and customary norms or legal regulations dictate the disposition of assets on death or divorce according to a variety of concerns that may be prioritized in a given culture: the preservation of viable economic and family units; the protection of children; transfers to dependents in the form of alimony or pensions. These norms or dictates may affect control over assets within the household – ensuring that those who do not have title to these goods have rights to determine their use. De jure and de facto rights to assets may also differ substantially and simple questions to determine asset ownership may not reveal who exerts control over the use and devolution of these assets.

Another problem is in the definition of assets themselves – particularly those assets owned and managed by resource-poor households. Assets have multiple functions. Guyer (1997) notes that “small-scale assets veer unnervingly between ‘investment,’ ‘consumption,’ and ‘prestige’ expenditures, precisely because – as has been claimed many times for many different purposes – families are not, in fact, factories, if only for the reason that they tend intransigently to resist going totally out of business in the face of adverse conditions.”³⁴ The assets of the poor can be simultaneously consumption items, savings, investment, or gifts. For example, small livestock can embody all of these properties. Pigs or goats are portable, loanable, savable, can act as collateral, have the potential to resist depreciation, can appreciate, and can also be consumed. They can also be sold or “liquidated” quickly to provide much-needed cash. The role that small livestock play can change depending on the circumstances of the household and the needs of the household members. Ownership may shift over time to reflect these needs. A goat may be owned by one member of the household, but if there are young children or sick and aging family members, the milk may be destined for other household members and control over the asset may be temporarily ceded. Similarly, assets brought to the household at marriage by one individual may become common property or pass to another household member.

³³ These allocations may change depending upon whether the divorce is perceived to be no-fault or not.

³⁴ In the face of death or divorce, the parenthood of one party is usually preserved. Furthermore, the claims that kin who were once co-members of the same household – regardless of their current residence – can make upon other members can be lifelong and realizable in a variety of conditions of need or surplus. Remittance transfers from migrants provide one example of a transfer that endures beyond co-residence.

Another complication is that the observed asset allocation at any one moment in time may not describe the full range of resources available to an individual. For instance, common property resources may sustain many members of a poor household. Access rights or entitlements to this common property may be gender and time-specific. For instance, Fafchamps and Quisumbing (2001) document the case in Ethiopia that a community may choose to house and feed widows and wives of villagers drafted into the army. Moreover, free access to communal resources, such as firewood and grazing land, may partly compensate the negative effect of patrimonial laws and customs on women. These rights may be extended to an individual by the community in the event of death or divorce.

These examples highlight that understanding how assets are allocated within the household may require complex survey instruments that ask about both ownership and control and the devolution of these assets in the event of death or divorce. While the potential exists to explore intra-household asset allocation as a means to estimate individual per capita consumption, the analysis may be most tractable in the case of adults and household heads. It is unlikely that such an analysis could be rigorously conducted for children. Pursuing such an analysis for all household members would most likely require a two-step procedure predicting consumption expenditures per capita for each adult in the household as a function of their asset holdings and control variables, then deducting these allocations from total predicted household consumption and dividing the remainder among children who own few or no assets.

2.3. Implications for Developing Low-Cost Intra-Household Poverty Assessment Tools

The previous sections underscore that the distribution of resources within a household may not be equal and that some household members may be more privileged than others. In some cases these inequalities reflect gender and age biases.

Individual preferences and social norms are likely to determine the intra-household allocation of resources as well as any surplus from operating microenterprises. Resources in the hands of one household member may be disproportionately likely to be spent upon improving the welfare and wellbeing of household dependents – such as the young and the old – while the same resources in the hands of another household member may be more likely to be channeled into extra-household investment in tools and machinery.³⁵ The long-term implications of these different preferences and expenditure patterns can affect household welfare as well as individual vulnerability to poverty.

Inquiry into intra-household poverty and inequality can be quite burdensome: requiring substantial and detailed data that are individually disaggregated on consumption, expenditure, or asset ownership for each household; necessitating well-trained enumerators; and demanding significant commitment and patience on the part of the interviewee(s). Such an effort is costly in terms of both financial resources as well as human capital. Furthermore, these disaggregated data have to be carefully and laboriously entered into a statistical package and analyzed. The data should be archived in such a way as to preserve all appropriate individual-level information. This report recommends refining low-cost tools that establish the potential for intra-household

³⁵ Agnes R. Quisumbing and Bonnie McClafferty “Using Gender Research in Development,” International Food Policy Research Institute. Washington D.C. 2003, provide an excellent analysis of the implications of intra-household inequality for project management and evaluation.

inequality that may affect individual estimates of vulnerability to poverty which can be applied by the microfinance and microenterprise institutions.

Comparable data on the financial cost of implementing intra-household surveys are generally not available on a per household basis. However, some assessment can be made of the relative financial and non-financial costs of such surveys. Financial costs vary substantially depending on the country surveyed, size of the sample, number of modules, survey infrastructure already in place (trained enumerators and data entry personnel, transport, computers, etc), and types of quality controls and cross-verification procedures. For example, most LSMS consist of nationally representative samples of 1,500 to 5,000 households.

Calculated cost figures have varied from \$78 per household for a 2,000-household survey in Jamaica, to over \$700 per household for a 4,480-household survey in Brazil. In the majority of cases, the cost per household falls between \$150 and \$250.³⁶ The Poverty Assessment Tools project estimates that it costs an average of between \$55 and \$75 per household in the five countries where primary data on households were collected. Since the Poverty Assessment Tools Project surveyed a smaller sample with fewer questions and modules, it is not surprising that the per household costs are substantially lower.

Table 2 provides a cost-based ranking of the existing approaches based on information about relative survey costs from a variety of agencies. Analysis of intra-household nutrition intake is the most financially costly survey to implement and analyze. These surveys are also the most burdensome for enumerators and interviewees. In contrast, health outcomes and asset ownership assessments appear to be less costly.

³⁶ This is a gross estimate that includes all administrative and supervisory costs and assumes an average sample size of 3,000 households. See IRIS "Review of Poverty Assessment Tools." 2004.

Table 2. Cost-Based Ranking of Existing Approaches for Establishing Intra-Household Inequality

Costs	Approaches			
	Nutrition Intake	Anthropometry ^a	Investment in Health Care ^b	Asset Ownership
Development of survey instrument	4.3	2.3	3.3	2.8
Time-intensive data collection (time and financial cost as well as burden on the household)	5.0	3.0	2.8	2.8
Training enumerators	4.0	2.5	2.0	2.0
Data processing (time required for training, entering and cleaning data)	3.8	3.3	1.8	2.0
Statistical analysis	2.7	2.0	1.8	1.8
Overall Ranking	3.9	2.6	2.3	2.3

Notes: Rank 1-5, 1 is least costly, 5 is most costly

^aAnthropometry indicates weight-for-height and height-for-age measures of wasting and stunting.

^bThis approach summarizes estimates of direct and indirect health-care expenditures per person – including travel costs, consultations and medicines.

Source: Based on interviews with representatives from the Living Standards Measurement Survey, the International Food Policy Research Institute, and the University of Maryland.

In appraising the utility of these approaches for the Poverty Assessment Tools, we should consider both the average and marginal costs of undertaking these types of surveys. While investment in health care and asset ownership analyses are potentially among the least costly approaches, the marginal cost of incorporating a sex-disaggregated asset ownership instrument into the Poverty Assessment Tools is likely to be lower than developing an additional health-care investment module.

In addition to the financial costs of these surveys there may be concerns about sampling and non-sampling errors. Sampling errors result from making inferences about a whole population from observing only some of its members. Broadly, the sampling error is inversely proportional to the square root of the sample size. This means that in order to reduce the error of a particular sample by half, the number of households surveyed must be quadrupled. The Poverty Assessment Tools are designed for households that are clients of the microfinance and microenterprise institutions. This is already a non-random population of households. Thus the concerns about sampling error will be less important. Non-sampling error, however, may be of greater concern. Non-sampling errors are those that occur because of events such as household refusals, respondent fatigue, interviewer error, etc. Non-sampling errors are hard to predict – but pilot testing instruments, training enumerators and data entry personnel, developing clear and intelligible survey questions, and reducing the length of the instrument are likely to minimize

these errors. In appraising the methods in Table 2, non-sampling error is likely to be greatest for the nutrition and asset surveys.

Not only are surveys to establish the presence of intra-household inequality costly, but they may not yield sufficient information to determine whether an individual in any given household is poor. Table 3 compares the four primary intra-household inequality approaches in terms of their ability to determine current basic needs insufficiency, previous basic needs insufficiency, and current consumption poverty. Only the nutrition intake surveys yield information that would be useful in determining current consumption poverty or current basic needs insufficiency. Individual asset ownership could be used as an independent variable in the Poverty Assessment Tools to predict individual per capita consumption, but without any subsequent analysis would not yield a measure of consumption poverty or needs insufficiency.

None of these approaches yields a monetary measure of insufficiency or scarcity that can be compared with the Poverty Assessment Tools poverty lines. Furthermore, each approach has particular challenges for data collection and analysis. As explained in section 2.2.1, nutrition intake requirements vary according to the activity rate and age of a given individual. This information would be required in order to use this approach to determine current basic needs insufficiency or current consumption poverty. Anthropometry is not particularly helpful for an adult population – especially in the presence of obesity and over-nutrition. Investment in health care varies substantially according to the age and health status of an individual. And finally, asset ownership does not yield information about basic needs insufficiency or current consumption poverty – unless it is used to predict per capita income or consumption in a similar fashion to the Poverty Assessment Tools.

Table 3. Utility of Intra-Household Inequality Approaches for Establishing Poverty Status

	Approach			
	Nutrition Intake	Anthropometry	Investment in Health-Care	Asset Ownership
Current Basic Needs Insufficiency	Yes	No	No	No
Previous Basic Needs Insufficiency	No	Yes	No	No
Current Consumption Poverty	Yes	No	No	No

Developing other less burdensome instruments to explore intra-household inequality that can establish individual poverty status would be important if the Poverty Assessment Tools are to address intra-household inequality and poverty. The following section provides a menu of potential options that may shed light on the existence of intra-household inequality and yield some measures of intra-household poverty.

3. FURTHER TOOLS FOR INTRA-HOUSEHOLD POVERTY ASSESSMENT

The purpose of this paper is to review the literature on intra-household resource allocation and poverty and make some recommendations for the use of survey instruments that can capture these types of inequalities. What follows in this section is a brief review of some additional potential instruments and approaches, both qualitative and quantitative, that may facilitate such an analysis.

Currently, the poverty tools³⁷ project uses a variety of data on clothing expenditures, assets, education, housing, and consumer durables and a number of simple control variables, such as the household size and age of household head, to predict expenditures per capita. Predicted expenditure per capita is then used to determine whether the household falls below the per capita poverty line of US\$1 per person per day³⁸ or 50 percent below the poverty line established by the national government.³⁹ The household is defined as being very poor if per capita expenditures fall below these lines. The microfinance institution is at liberty to choose that line which yields the highest headcount of the “very poor.”

The Poverty Assessment Tools measure the percentage of very poor households among microenterprise clients; hence they are designed to measure poverty on a collective, rather than individual, basis. They are less likely to be accurate at predicting household-level poverty. Accuracy in the case of poverty measurement, refers to two types of errors: misclassifying a very poor household as not very-poor; and the opposite, misclassifying a not very-poor household as very poor. The Poverty Assessment Tools have been designed to minimize these types of errors ensuring that the number of very-poor households misclassified as not very-poor is the same as the number households misclassified in the other direction.⁴⁰

In countries with a low poverty rate, the poverty tools project uses a two-step procedure to improve poverty accuracy.⁴¹ The consumption data are used first to predict the non-poor and second to predict who is poor among the remaining subset of households. In some cases, the poverty tools project used single-step quantile regression techniques⁴² to improve the accuracy of estimates in countries with low extreme poverty incidence.

While the tools are not designed to predict individual household and intra-household poverty, they could be used to do so, with some loss of accuracy. This section of the report explores a number of simple adjustments that could be made to the existing instruments developed under the poverty tools project and suggests some modifications to the existing analytical tools to address intra-household inequality among microfinance recipients. Further work would need to be done to develop and refine these tools and to explore their relative costs and benefits.

³⁷ See www.povertytools.org/.

³⁸ This is expressed in terms of purchasing power parity at 1993 prices using the Penn World tables.

³⁹ These represent national poverty lines and do not take into account differences between rural and urban cost of living.

⁴⁰ In a large enough sample, individual misclassifications are unimportant, since the two types of errors would cancel each other out, regardless of how large they are. However, these misclassifications will matter at the individual household level. This explains why the same tool can be very accurate when measuring poverty at a collective level, but less accurate if used on an individual basis.

⁴¹ This is because models estimated with a single-step procedure using Ordinary Least Squares (OLS) were less accurate for the very poor than for the not very poor. This implies that the inaccuracies in prediction are not equally distributed over all expenditure percentiles and are systematically higher for the very poor.

⁴² Quantile regression provides a more complete picture of the conditional distribution of Y given X.

3.1. Pooled or Separate Budgets and Spheres of Activity

Households accumulate and dispose of resources unevenly over time. As Warner and Campbell (2000: 1328) observe, “Numerous studies indicate that husbands and wives have different productive and allocative priorities and conflict, rather than strict cooperation, appears to be an important behavioral characteristic in the household.” A distinguishing feature of the nature of these different productive and allocative priorities can be whether households engage in joint or separate production and pool or maintain separate budgets for a variety of expenditures.⁴³

Warner and Campbell document the case of Tanzania where production in the household centers upon food and cash crops. The food crops are those that are consumed directly by the household, while the cash crops are those that are sold to generate income. The principal food crops grown are maize and some root vegetables. Women are the primary producers of food crops and maintain these for household consumption while men are primarily responsible for cash crop production. Men and women tend to specialize in these different realms of production, but their activities are not mutually exclusive. However, even while women may render labor in cash crop production, they do not control the use and disposition of the revenues generated from the sale of cash crops. Specific indicators that reveal the role of women in the allocation of cash resources are not readily available in Tanzania, except in small micro-datasets and research studies undertaken episodically by a range of social scientists and anthropologists. Yet it is clear that women face highly unequal access to land and must rely on their husbands to ensure their access to cultivable land for food crops. The Tanzanian legal system does not discriminate about access to land and land ownership rights for men or women. Unfortunately, customary law prevents women from having direct control over land. A woman’s access to land is typically extended in return for her commitment to provide food for the rest of the household.

Research in Tanzania also indicates that men see cash as a vehicle primarily to satisfy their own needs and production requirements. Combining their own labor effort with any amount of women’s labor that they can secure, they sell crops to purchase commodities and investment items that they require. Women are required to work on the male plots and help with cash-crop production, in order to gain access to land for food crops. They must therefore allocate labor effort to productive and reproductive activities, optimizing so as to limit the loss of control over their resources and labor effort. Warner and Campbell assert that “by resisting production that is converted into cash, women can reduce the possibility of losing control over their resources.”^{xi}

Duflo and Udry (2003) report similar findings in Côte D’Ivoire in their analysis of gendered crop production. They find that different sources of income are allocated to different uses within the household depending upon both the identity of the income earner and upon the origin of the income. These authors find that events that increase the output of crops predominantly cultivated by women shift expenditures toward all types of food consumption (except staples), while similar shocks affecting cash crops cultivated by men have no effect on the purchases of food.

⁴³ The likelihood that a household engages in separate production and consumption activities increases in the presence of polygamous households. See Linda Mayoux “Gender Issues in Developing Poverty Assessment Tools.” 2004. See also Barbara Evers and Bernard Walters “Extra-household Factors and Women’s Supply Response in Sub-Saharan Africa.” *World Development*. 2000, and Suman Ghosh and Ravi Kanbur “Male Wages and Female Welfare: Private Markets, Public Goods, and Intra-household Inequality, Cornell University, 2002, for a discussion of the impact of separate spheres of activity on farm-level productivity and household labor supply.

Katz (1995) also documents the existence of separate spheres of economic activity in rural Guatemala. Katz explores a variety of intra-household resource transfers and expenditure flows among a sample of rural households in the Central Highlands of Guatemala. She finds that women transfer significant labor time to new male income-generating activities, particularly if there are older daughters in the household who can assume some of the domestic labor that is normally the responsibility of the female head of household. Katz examines the relative responsibilities of men and women in decision-making across a number of spheres of consumption and investment. The paper demonstrates that expenditures can be classified as “male,” “female,” and “joint,” according to the various criteria of finance, purchase, and decision-making (see Table 2).⁴⁴ The paper concludes that male agricultural income is largely spent on male goods, affecting women’s ability to purchase foods and domestic technology such as cooking implements, buckets and baskets, and small electrical goods.⁴⁵

Table 4 describes how Guatemalan household members divide the responsibilities for the finance and purchase of 11 major non-food expenditure categories. The expenditure categories are arranged so that those near the top of the table are the goods for which male heads of household have greater responsibility and those at the bottom are more closely identified with the female heads of household.⁴⁶ For example, in the case of house construction and repair the finance and purchase were undertaken by male heads exclusively in 83 percent of cases. In the case of animals and small livestock, women financed and purchased their acquisition in 36 percent of cases.

⁴⁴ The survey instrument asked who finances the purchase of the goods, who is responsible for making the actual purchase, and how the decision of whether to make the purchase is arrived at.

⁴⁵ These goods make up the basic technology of domestic labor.

⁴⁶ This assumes that dual headship prevails in a household unless a household is de jure female headed and no male spouse is present.

Table 4. Finance and Purchase of Major Non-Food Expenditures By Sex

Expenditure	% Male Financed and Purchased	% Female Financed and Purchased	% Male Financed and Female Purchased	% Joint Financed or Purchased	% Other
House construction and repair	83.3	3.3	3.3	6.6	3.3
Agricultural inputs and equipment	83.0	0.8	2.0	5.1	9.1
Bicycles and motorized vehicles	81.2	0.0	0.0	0.0	18.7
Prestige items	51.1	10.4	10.4	15.7	12.5
School fees, supplies and uniforms	49.5	4.6	23.0	9.3	13.7
Health care	14.9	14.2	25.6	24.8	20.6
Celebrations	15.9	6.3	31.7	27.1	19.1
Children's clothes and shoes	31.9	5.5	14.9	32.6	15.1
Women's clothes and shoes	10.5	20.1	26.8	34.8	7.7
Domestic technology	7.6	30.8	34.9	21.5	5.3
Animals	15.4	35.9	23.1	18.0	7.8

Source: Elizabeth Katz "Gender and Trade Within the Household: Observations from Rural Guatemala." Table 4. 1995: 337.

When analyzing decision-making, Katz finds that exclusive decision-making is relatively rare, even for categories of goods where the finance and purchase are heavily gender-specific. Interestingly, the purchases most likely to be made without consultation were for domestic items, where almost 20 percent of women considered these to be unilateral decisions. Notwithstanding, there is a high degree of correlation between decision-making patterns and the finance and purchase of non-food expenditures.

In her article Katz (1995) demonstrates methodologically that "intra-household processes are empirically traceable, and that the results obtained from direct observation of intra-household transfers are significantly more reliable than those that are the product of interpolation from standard data sets."^{xii} These findings indicate that questions about whether household members maintain separate spheres of economic activity and maintain separate or pooled budgets could be integrated into the Poverty Assessment Tools to uncover the potential for intra-household inequality in expenditures.

Additional questions about separate budgets and spheres of activity need not be exhaustive of every category of expenditure. Table 5 reports the proportion of total household expenditure per capita spent on four main categories of expenditure: food, clothing, health care and

education for the four countries where IRIS collected data. What is clear is that these categories account for a significant portion of total expenditure, upwards of 56 percent in all four countries. Furthermore, food expenditures command the greatest consumption share, over 40 percent in all four countries and rising to as much as 56 percent in Bangladesh. Questions that establish separate budgets and spheres of activity could focus on these four main categories and a variety of productive and subsistence activities.

Table 5. Proportion of Total Household Expenditure Per Capita Spent on Different Consumption Categories in 2004

	Bangladesh	Peru	Kazakhstan	Uganda
Clothing	0.05	0.06	0.11	0.03
Food	0.56	0.43	0.47	0.47
Health Care	0.06	0.02	0.05	0.04
Education	0.02	0.04	0.03	0.06
Total	0.69	0.56	0.65	0.61

Note: Adjustments to estimated proportions were made excluding outliers where proportions exceeded total household expenditures.

Source: Anthony Leegwater analysis of IRIS datasets for Bangladesh, Peru, Kazakhstan and Uganda, 2006

In households where separate spheres of activity or separate budgets are maintained, inequality in access to resources is more likely to prevail. Where there is greater inequality, there is the possibility that some household members are more likely to be poor than others. Adding a series of questions to the household survey instrument that ask explicitly whether household heads or credit recipients maintain pooled or separate budgets for a variety of expenditure categories such as food, clothing, health care and education, would yield information that can highlight which households may be disproportionately vulnerable to intra-household inequality.⁴⁷

Similarly, questions could be asked to develop a profile of asset ownership by individuals within the household. This departs from the spirit and approach of the Poverty Assessment Tools in that it would require that the microfinance and microenterprise institutions sample more than one respondent in a client household. But should this be determined to be a viable approach, the enumerators could collect information on asset ownership and control over these assets following the common indicators in the four broad categories identified in the poverty assessment tools: education, housing, consumer durables, and agricultural and financial assets.⁴⁸ The existing poverty tools could then be modified to predict per capita expenditures separately for individuals and sub-groups of the household (most likely children), assigning pooled assets to all sub-groups and assets that are individually owned or controlled to the appropriate individual. It may also be useful to include additional regressors for the types of activities associated with the separate spheres – such as traded or non-traded agricultural production, domestic work, microenterprise activities, etc.⁴⁹

3.2. Weighting and Adult Equivalence

The Poverty Assessment Tools for microfinance and microenterprise development practitioners estimate unweighted per capita consumption from a parsimonious set of assets and a series of

⁴⁷ This recommendation is discussed in greater detail in section 4.1.

⁴⁸ See IRIS “Best Poverty Indicators for 12 Poverty Assessment Tool Countries.” 2005.

⁴⁹ See section 4.2 for more detailed recommendations.

control variables that include the household size and age of the household head.⁵⁰ These predicted per capita expenditures are then compared to the appropriate poverty line to determine which household is poor. These tools assume equal consumption by all household members and treat all household members as adult equivalents, that is, no adjustment is made for the potentially different needs of children, adults of reproductive age, and the aged.

Per capita definitions of potential consumption or income available in a household may not reflect the actual allocations of these resources – especially in conditions of scarcity or insufficiency. One set of adjustments that is frequently undertaken to aggregate household data is weighting and adult equivalence. Some intra-household inequality may be the outcome of the fact that different individuals need different amounts of resources. In the case of food consumption and nutrition, we have already established that some household members require different amounts of nutrition: the young, old, pregnant and lactating all require different types and amounts of food and nutrients. Adult equivalence measures establish a methodology for reflecting these differences. Such adjustments are frequently based on caloric intake, and express the relative needs of each individual in the household as proportion of a full adult male.

Quisumbing, Haddad and Peña (1995) explore a variety of income and expenditure-based poverty measures and investigate their sensitivity to the use of per capita and adult equivalence units. They make the following observations about the use of these types of adjustments. First, per capita measures that are based on household size may tend to overstate poverty in households with many children. Consequently, when applying adult equivalence measures in large households with many children, we may find that households that were previously defined as poor may no longer be so.

A second concern is that adult equivalence scales may mask dependency burdens⁵¹ by assigning a weight of less than one to women and children on the assumption that their consumption needs are less than those of adult men. Adult equivalence scales are usually based on an individual's actual consumption or expenditures as measured by household survey data. But, as we demonstrated earlier, these allocations could reflect the outcome of unequal bargains within the household, or a lack of information about consumption requirements, rather than a response to biological need.

In many cases the adult equivalence scales that are applied are done so uniformly across countries. Such an adjustment neglects cross-country variation in the cost of raising children or meeting the needs of the elderly and infirm. Adult equivalence measures also fail to incorporate the time costs of raising children or caring for the sick and elderly. These costs are borne by household members but are not expressed in any money metric. Considering the time costs raises the consumption cost of a child or of caring for the sick and elderly – but it also increases the consumption costs disproportionately for women. Adult equivalence adjustments of expenditure data, like per capita adjustments, fail to take account of the non-monetary costs absorbed by the household and borne differentially by different members of that household. Consequently, both per capita and adult equivalence measures may understate poverty in

⁵⁰ In several countries, the coefficients for the estimates for predicted consumption were based on regressions using LSMS data that had been weighted for adult equivalence. However, the final Poverty Assessment Tool treats adults and children as equivalent and does not adjust the per capita figure downwards according to the number of children in a given household.

⁵¹ Dependency can be defined demographically or economically. Demographic dependents are typically those members of a household 15 years of age and younger and those 65 years of age and older. Economic dependents are those who do not earn income or generate resources.

households facing acute need and illness where there is a greater demand for resources for particular members.

These concerns notwithstanding, an adult equivalence or a needs-based equivalence adjustment could be undertaken as part of the Poverty Assessment Tool in households where there is evidence of unequal access to resources. Such an adjustment could be made to reflect the particular needs of individuals or insufficiencies that they face and used to derive approximate individual assessments of the relative consumption shares that each member of the household commands. The adjustment would be based on a set of questions about insufficiency asked of every adult about their own needs and those of their dependents. The responses could be used to develop scales or needs-based weights. These would generate internally set weights or scales in a similar fashion to Participatory Wealth Ranking.⁵² These scales could be defined to meet the specific economic and cultural context of each microfinance and microenterprise service provider (see section 4.3). The disadvantage of this approach is that these subjective appraisals of individual insufficiency are not strictly comparable across communities or regions.

3.3. Subsistence Production

Another concern about indicators of intra-household poverty and inequality is that these measures are highly sensitive to the metric used. To overcome some of the problems associated with income measures of poverty, researchers frequently use consumption or expenditure measures of poverty. But these too may be subject to measurement error. There is frequently a need to impute a value to the consumption of home-produced or subsistence goods and services as well as those received as wages, gifts and loans.

Quisumbing, Haddad and Peña (1995) establish that the use of cash income as the sole measure of household income tends to underestimate the welfare of subsistence households. The same is also true of consumption measures of poverty that focus only on expenditures. The relevance of this critique for the Poverty Assessment Tools is that if subsistence production disproportionately occurs in households with lower asset ownership and consumption and the value of this subsistence production is not taken into account, then these households may be falsely defined as being poor. In our typology of errors, this corresponds to a Type II error. There may also be a gender dimension to this concern. “If subsistence production is positively associated with households with a large proportion of female adults, and subsistence production is underestimated, these households will be falsely associated with poverty.”^{xiii} The opposite could of course be true for different cultural settings and should be thoroughly investigated in each context.

In some households, certain members of the household will depend disproportionately on subsistence production. For example, in many households across Africa, women are largely responsible for the provisioning of food from agricultural production. Men provide cash income for other expenditures. The Poverty Assessment Tools predicted per capita daily expenditures estimated using data on an array of household assets. Pooling all predicted consumption expenditures and dividing these by the total number of household members will fail to take account of subsistence production – since this is self-produced and consumed and no monetary expenditure is undertaken. Moreover, such an adjustment will also fail to take account of the

⁵² See IRIS. “Review of Poverty Assessment Tools.” 2004 for a more detailed discussion of internally set weights.

fact that some members of the household command more subsistence production resources than others.⁵³

Adjustments could be made to the existing poverty tools calculations for predicted expenditures to reflect subsistence production in households where there are distinct and largely separate spheres of activity. If there is evidence that some household members are disproportionately responsible for provisioning through subsistence cultivation, predicted total household expenditures could be adjusted upwards to reflect the value of subsistence production.

These adjustments could also reflect the separate spheres of activity and fragment the household into sub-units with their own predicted per capita expenditures using individual-specific asset measures and control variables such as education, age, sex, sector of labor market insertion, etc.

3.4. Seasonality and Shocks

Household income may be “lumpy” and accrue unevenly over time. Many households engage in economic activities that are marked by a distinct seasonality. This is particularly true for agricultural households. Yet, households typically smooth their consumption, saving in surplus times and borrowing in lean times. If income varies substantially, the snapshot of a household at one moment in time may not represent their true or permanent income.

For this reason, most poverty analyses focus on consumption and expenditure poverty. But consumption and expenditure may also be subject to variation. One cause of variation is a shock, or unanticipated event. A death in the family, illness, floods that destroy crops or housing, theft or fire – all these events can produce a sudden change in the circumstances of a household. The data that have been collected on income, consumption, and asset holdings may no longer reflect the resources available to the household. Intra-household inequalities that may have been latent or obscured prior to the shock may become exacerbated after the shock. Scarcity may prompt a division of resources that prioritizes wage-earners over non-wage earners and the young over the old.

Expanding the poverty tools survey instrument to include questions about how a household copes with shocks or has coped in the past may yield information about who within the household could be more vulnerable to poverty. Additionally, tracking households over time and taking account of any income and consumption shocks that they may experience would enable the microfinance and microenterprise institutions to build a more accurate picture of poverty.⁵⁴ Households that may have experienced an income or consumption shock should also be subject to a set of questions about pooled or separate budgets and spheres of activity to establish whether there may be potential for intra-household inequality and poverty.

⁵³ The LSMS surveys typically do estimate and report the value of subsistence production. These questions could be integrated into the existing Poverty Assessment Tools questionnaire.

⁵⁴ The Microenterprise for Self-Reliance Act does not mandate that microfinance and microenterprise development institutions track households over time. This is an additional activity that may inform the microfinance and microenterprise development institutions’ understanding of the dynamics of poverty and household coping strategies in the face of risk and exogenous shocks.

3.5. Time Poverty

Both income and consumption measures of wellbeing fail to incorporate differences in time use. Women generally consume less leisure time than men due to their different responsibilities outside and within the household. Although both men and women divide their time between paid and unpaid work and leisure, women consistently work more hours in paid and unpaid work and consume less leisure time than men.^{xiv,xv} Consequently, women may be time poor. Furthermore, low income women (and men) have longer working days than higher-income women (or men) often to the detriment of their own health and nutritional wellbeing. Measures of welfare and wellbeing that incorporate leisure using detailed time allocation data may more accurately measure poverty or scarcity and provide an indicator of the ability that a household may have to take advantage of resources such as credit, training and business development.

Incorporating questions about time poverty into the poverty tools instrument may reveal some of the particular constraints that women face in a household. It will also reveal insubstitutabilities of male for female labor. Work in the household or reproductive sector may not be fungible. Where indivisibilities (task cannot be broken down into component activities) and insubstitutabilities (other individuals cannot assume the responsibility for tasks) exist, there may be little opportunity for the timing and sequencing of tasks to be reconfigured. Consequently, as the result of strong gender proscriptions women (and men) may be time poor. If you are time poor you have limited opportunity to increase your income and consumption by engaging in more productive work. If you are time poor, you may also be more dependent on the earnings of other household members to secure your consumption needs. Identifying who may be time poor can also highlight an individual predisposition to poverty, especially in the context where separate budgets and separate spheres of activity prevail.

4. RECOMMENDATIONS

Failing to address intra-household inequality may obscure the fact that some household members are poorer than others. Moreover, it will produce biased and inconsistent assessments of individual poverty. Yet, capturing intra-household and gender-based inequalities in access to household resources is inherently time-consuming, complex, potentially burdensome for enumerators and interviewees, and frequently expensive. Relatively few datasets that explore intra-household inequality exist and no comparative assessments have been undertaken that explore different approaches and determine accuracy at either the household or sample population level.

Various options are available to attempt to address intra-household poverty and inequality in the application of Poverty Assessment Tools for microenterprise development. They will involve a departure from the current methodology, since these modifications would require estimating the presence of intra-household poverty at the household as well as sample population level. Additional questions would need to be incorporated in the PAT survey instrument and new estimation techniques deployed to estimate intra-household inequality and poverty. The key is to devise simple, minimalist, low-cost tools that are not burdensome for enumerators or interviewees for such an assessment to be easily operationalized by microfinance institutions. What follows is a series of recommendations that would need to be pilot-tested for accuracy and to assess their relative costs and benefits. These approaches, however, are put forward because they may be less burdensome and financially costly than the methods reviewed in section 2. We recommend that these approaches be pilot-tested and compared for accuracy using a modified version of the Poverty Assessment Tools questionnaire in at least four countries where LSMS data that have intra-household resource allocation modules exist. Accuracy should be measured both at the household and sample population level.

4.1. Pooled or Separate Budgets

A number of questions could be integrated into the existing Poverty Assessment Tools questionnaire that ask explicitly about pooled or separate budgets and spheres of activity. These questions should be asked for a range of different spheres of consumption and expenditure decisions.

- Does the household maintain separate budgets for food, clothing, education and health expenditures? If so, who determines and who finances these expenditures?
- Do the principal income earners control the income that they generate?
- Do women control the income that they generate? If so, on what do they typically spend it?
- Do women have access to all of the cash income generated by men in the household? If not, to what percentage do they have access?
- Do men have access to all of the cash income generated by women in the household? If not, to what percentage do they have access?

In the case that separate budgets are established for significant portions of household expenditure, then there is likely to be sufficient evidence of the potential for intra-household inequality.

The interviewer will need to ask probing questions about whether the micro-entrepreneur can control the income generated through their own economic activity.⁵⁵ A secondary survey instrument could be developed that would allow the microfinance and microenterprise development institutions to collect data on individual needs and determine within a particular household who may be the most vulnerable to poverty (see section 4.3).⁵⁶

4.2. Asset Ownership

This report establishes that the existence of uneven asset ownership within a household may be indicative of other inequalities in consumption and wellbeing. Current assets are used in the poverty tools analysis to predict current per capita expenditures and determine poverty rates. Consequently, collecting data on key assets and tracking who owns and controls these assets could allow for a more detailed and disaggregated picture of individual predisposition to poverty or ability to withstand income and consumption shocks. This could be undertaken only for those households where separate budgets and spheres of economic activity have been established since these households are more likely to manifest intra-household inequality.

The assets to be considered should reflect those already established by the Poverty Assessment Tools project in the four broad categories: education, housing, consumer durables, and agricultural and financial assets.

Following the list of best poverty indicators developed for the Poverty Assessment Tools, key assets and financial resources that could be considered are:

- Dowry and bride payments
- Refrigerators
- Stoves
- Vehicles
- Livestock
- Remittances

The enumerators would have to establish who owns and who has control over the use and devolution of these assets and financial resources in a variety of circumstances. Individual asset allocations could be used to predict per capita consumption for all household members, following the procedure outlined in Section 2.2.3. Current assets, and a series of control variables including age, sex, education, labor market insertion, time poverty and subsistence production could be used to predict per capita consumption for adult household members. Adjustments may have to be made for jointly-held assets or for constrained access to the income or a stream of benefits from jointly-held assets. These individual predictions should be aggregated and subtracted from total predicted household consumption and the remainder

⁵⁵ Anne Marie Goetz and Rina Sen Gupta (1996) establish that women may not control the loans that they receive. They document that 63 percent of loan recipients in Bangladesh had partial, very limited or no control over the use of the credit that they had obtained.

⁵⁶ Such an approach could enable microenterprise development institutions to target households that were determined to be not very poor if an individual or a number of individuals were found to be very poor using an intra-household measure of consumption poverty.

allocated to other household members for whom asset ownership could not be determined. The allocation of the residual could be made using some type of adult equivalence or needs-equivalence scale (see Section 4.3).

Such a procedure would need to be developed and refined for each cultural context using focus groups and key informant interviews to verify or determine those social norms that dictate asset devolution across the life-cycle as well as through death and divorce.

Additionally, a series of statistically rigorous procedures would need to be developed to undertake constrained per capita consumption expenditures for each individual so as to ensure that these allocations are bounded by total estimated household consumption. These predictions would need to be compared at the household level and sample population level. Given the accuracy approach followed by the Poverty Assessment Tools project, it may be easier to predict the percentage of households that face intra-household poverty at the sample population level. Additionally, care must be taken to ensure that these techniques can be easily operationalized by the microfinance and microenterprise development institutions.

4.3. Weighting for Individual Needs

This section outlines a two-step procedure, with attempts to estimate intra-household inequality being undertaken only for a subset of beneficiaries where there is likely to be the presence of intra-household inequality. This approach combines a needs equivalence adjustment – where adjustments are made for different household members to require more household resources than others if they are pregnant, lactating, sick, engaged in hard manual labor – and an individual needs assessment.

The first step is to establish that the household (1) maintains separate budgets, (2) has a divided labor allocation for subsistence and productive activities, and (3) has unequal asset holdings (where men and women bring different assets to the household and retain control over these assets). If this is the case, then we have a household in which intra-household inequality is likely to prevail.

One approach that incorporates the potential for intra-household inequality is to undertake a series of individual needs adjustments or weighting for a subset of households where we have established that separate budgets and spheres of activity exist. This could be done using an Individual Needs Matrix for all adult household members and their dependents. The Individual Needs Matrix would allow us to ask those adults in households where there is the potential for intra-household inequality whether they or their children and dependents have faced shortfalls meeting their basic needs for food, clothing, education, and health expenditures, etc. The potential needs of these household members would then be assessed using a country-specific scale that combined the caloric requirements and health-care needs of adults and children, as well as the sick and healthy, and developed a needs equivalence scale or individual needs weighting.

Using the Individual Needs Matrix we can develop an index of individual vulnerability to poverty that can be used to re-weight the predicted consumption expenditures to reflect different needs and requirements for each household member. The index and the types of questions asked about basic needs shortfalls should be validated in each cultural/economic context by the

microfinance and microenterprise development institutions using focus groups and/or key informant interviews.

Table 4 provides an overview of this approach and summarizes a hypothetical household with 6 members: a male household head who is 35 years of age, a female household head who is lactating, an older father who is infirm and unable to work, and three children aged 1.5, 5 and 8 years old. The household is determined to have separate budgets and spheres of activity. The total estimated household consumption is \$620 per month. Using an unadjusted measure of per capita consumption, this translates into \$103.33 per person per month. If the hypothetical poverty line to be applied is \$100 per person per month, then the household will be judged to be not very poor.

Using a country-specific individual needs equivalence, the sum of the individual needs weights comes to 5.8. Consequently, dividing predicted consumption by 5.8 yields a per capita figure of \$106.90 – which is also above the poverty line. But apportioning out predicted consumption to each individual according to his or her needs yields a distribution of predicted potential consumption. If the predicted potential individual consumption exceeds the needs adjusted per capita figure, then the individual may be vulnerable to poverty.

The needs shortfall column indicates whether the adults perceived that their own or their dependents' key basic needs had gone unmet in the last year. This is clearly a subjective indicator of well-being and will be difficult to verify. Furthermore, an individual's perception of his or her needs may respond to social norms and expectations. Some people may have internalized their lack of rights to such an extent that they may not perceive that their needs are not being met. Yet in the absence of verifiable data on individual wellbeing and scarcity, asking an individual directly about his or her experience of deprivation can yield important information. If there is a correspondence between a perceived shortfall in needs and the calculations adjusting for individual needs, then we may assume that these individuals are vulnerable to intra-household poverty. In this example in Table 4, we would identify the lactating mother and aged father as vulnerable to intra-household poverty.

Table 4. Example of the Individual Needs Weighting

Individual	Sex	Age	Individual Needs Equivalence	Needs shortfall	Average Predicted Per Capita Consumption	Adjusted For Individuals Needs Equivalence
1	1	35	1.0	No	103.33	106.90
2	2	28	1.2	Yes	103.33	128.28
3	1	68	1.4	Yes	103.33	149.66
4	2	1.5	0.6	No	103.33	64.14
5	2	5	0.8	No	103.33	85.52
6	1	8	0.8	Yes	103.33	85.52

Notes: Sex code, 1=male, 2=female

Such an approach would need to be developed and refined in focus groups adapting pre-established needs-equivalence scales for caloric and health-care needs.

4.4. Survey Design, Data Collection and Management

To operationalize these recommendations would require adding a number of questions to the IRIS poverty tools questionnaire about separate budgets and spheres of activity. Subsequently, a secondary instrument would need to be developed that collects data on the individual needs of each adult and their dependents and their experience of scarcity and insufficiency over the last year.⁵⁷

Additionally, a consultant would need to work with the microfinance and microenterprise development institutions to develop a country-specific needs-equivalence scale based on minimum caloric intakes, and average expenditures for health care and education by cohort.⁵⁸ These data will be combined to produce a needs-equivalence scale that can be further refined in focus groups. The focus groups should distill norms and expectations about sufficiency and insufficiency for different categories of individual: old, young, healthy, infirm, pregnant, lactating. Particular care must be taken to challenge and not reinforce norms about gender stereotypes in these focus groups.

Once the needs-equivalence scale has been developed, the national poverty lines can be adjusted and the potential for intra-household poverty can be established as outlined in section 4.3.

Certain types of analysis can be hampered by data collection and archiving methodologies. Care must be taken to train the enumerators and to ensure that culturally appropriate interview techniques are pursued. In those countries where women are not allowed to talk with males who are unrelated to them, women enumerators must be available to conduct the interview.⁵⁹ Similarly, once the data have been collected they should be carefully archived in such a way that preserves disaggregation. Data on individual needs, assets, budgets and spheres of activity must be preserved with the sex, age and household member identifier of the individual in “flat files”⁶⁰ that can be easily aggregated and disaggregated. This is particularly important, because the loss of such highly disaggregated data will prevent any ability to identify whom within the household is most likely to be vulnerable to intra-household poverty and inequality. Moreover, the agencies may wish to track such individuals and evaluate their disbursement of credit in light of the ability to compensate for any insufficiencies and improve their welfare and wellbeing.

4.5. Training and Technical Assistance

These recommendations would need to be developed further and pilot-tested to ensure that they are feasible and can be applied by the microfinance agencies themselves.

⁵⁷ The question should be asked for a specific period of time so as to minimize recall error.

⁵⁸ This departs from the spirit of the Poverty Tools Assessment which intends to develop globally applicable tools that do not require country-level modification beyond the use of country-level poverty lines.

⁵⁹ Mayoux (2004) cites a study in Nicaragua which found significant differences in response on the poverty status of the same households depending not only on whether men or women were interviewed, but whether they in turn were interviewed by men or women.

⁶⁰ The data are arranged in an ordered sequence preserving critical information about age, sex, and household identification number.

Training and technical assistance would need to be provided to ensure that the procedures are being correctly followed and to respond to any concerns or questions that the microfinance agencies may have. Training and technical assistance should be provided in the following areas:

- Understanding the basic concepts of intra-household poverty and inequality;
- Developing the questions for separate budgets and spheres of economic activity;
- Conducting and analyzing focus groups on basic needs;
- Developing a needs-equivalence index in each country;
- Data collection and processing; and
- Data analysis of intra-household poverty.

A series of manuals would need to be developed guiding the implementation of the survey protocols:

- A supervisor manual that makes explicit the objectives, methodology, and organization of the survey and details the supervisor's responsibilities;
- An interviewer manual that provides concepts and definitions and guides the interview process; and,
- A data entry manual to explain how data should be coded, entered and processed, and the range of potential responses that could be recorded.

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APPENDIX I

Table I. Living Standards Measurement Surveys

The Living Standards Measurement Study (LSMS) household surveys are a series of datasets that have been developed by the World Bank in collaboration with national statistical agencies in a number of developing countries. The Development Economics Research Group (DECRG) of the World Bank, formerly the Policy Research Department, maintains this website to make available to researchers around the world the data sets and methodological lessons from these surveys.

The main objective of LSMS surveys is to collect household data that can be used to assess household welfare, to understand household behavior, and to evaluate the effect of various government policies on the living conditions of the population. Accordingly, LSMS surveys collect data on many dimensions of household well-being, including consumption, income, savings, employment, health, education, fertility, nutrition, housing and migration.

Three different kinds of questionnaires are normally used: (1) the household questionnaire, which collects detailed information on the household members; (2) the community characteristics questionnaire, in which key community leaders and groups are asked about community infrastructure; and (3) the price questionnaire, in which market vendors are asked about prices. A fourth type of questionnaire, school or health facility questionnaires, is sometimes used as well.

The household questionnaires contain detailed questions on cash expenditures, the value of food items grown at home or received as gifts, and on the ownership of housing and durable goods (for example, cars, televisions, bicycles and sewing machines) to make it possible to assign them a use rental value.

A wide range of income information is also collected. For individuals in formal sector jobs, most surveys contain detailed questions about wages, bonuses and various forms of in-kind compensation. Information is usually sought on secondary as well as principal jobs. At the household level, agriculture and small enterprise modules are designed to yield estimates of net household income from these activities. Other sources of miscellaneous income, such as the receipt of private transfers (for example, child support or remittances from abroad), public transfers (in cash or in kind), lottery winnings and interest income, are recorded as well.

The number of field teams is kept small so that it is feasible to supervise them closely. LSMS surveys tend to use small samples, often in the order of 1,600 to 3,200 households and rarely more than 5,000 households. Although larger samples would have smaller sampling error, it was judged by survey designers that non-sampling errors would increase more than concomitantly. Having a small number of teams also helps to keep the cost of supplying them with vehicles and computers within bounds.

The LSMS survey teams use personal computers in the field, where all the stages of data collection, data entry and editing are carried out. This dramatically reduces the length of time between when the fieldwork ends and when the data become available for analysis. It also improves the quality of the data. The data entry programs that have been used for LSMS surveys have each been custom designed.

Source: Adapted from information available at <http://www.worldbank.org/LSMS/>

ENDNOTES

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ⁱⁱⁱ Becker, Gary. "A Theory on the Allocation of Time." 1965.

^{iv} Haddad, Lawrence, John Hoddinott and Harold Alderman. "Introduction: The Scope of Intra-household Resource Allocation Issues." 1997:5.

^v See Bouis, Howarth and Christine Peña. "Inequality in the Intrafamily Distribution of Food," pp179 in Haddad, Lawrence, John Hoddinott and Harold Alderman (eds.) *Intrahousehold Resource Allocation in Developing Countries: Models, Methods, and Policy*. Baltimore MD and London: The Johns Hopkins University Press, 1997.

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^{ix} See Quisumbing, Agnes R., and Bénédicte de la Brière. "Women's Assets And Intra-household Allocation In Rural Bangladesh: Testing Measures Of Bargaining Power," 2000, and Quisumbing, Agnes R. and John A. Maluccio "Intra-household Allocation and Gender Relations: New Empirical Evidence." 1999.

^x See Grootaert, Christian and Jeanine Braithwaite. "Poverty Correlates and Indicator-Based Targeting in Eastern Europe and the Former Soviet Union." Poverty Reduction and Economic Management Network, Environmentally and Socially Sustainable Development Network. Washington D.C.: The World Bank.

^{xi} See Warner, James and D.A. Campbell. "Supply Response in an Agrarian Economy with Non-Symmetric Gender Relations." 2000: 1330.

^{xii} See Katz, Elizabeth. "Gender and Trade Within the Household: Observations from Rural Guatemala." *World Development*. 1995:340.

^{xiii} See Quisumbing, Agnes, Lawrence Haddad and Christine Peña. "Gender and Poverty: New Evidence from 10 Developing Countries." 1995:3.

^{xiv} See WISTAT. United Nations Women's Statistics CD ROM.. New York: United Nations, 1995.

^{xv} See Floro, Maria. "Economic Restructuring, Gender and the Allocation of Time." November, 1995a. _____ . "Women's Well-being, Poverty and Work Intensity." 1995b.