Measuring Household Economic Status: Conceptual and Implementation Challenges

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Measuring the economic status of a household provides one of the crucial bricks in building social science research. Yet, economic status is also one of the most elusive concepts; partly because of the conceptual and theoretical difficulties in defining which aspect of economic status is most relevant and partly because of the measurement difficulties. Measurement is particularly problematic for modern demographic research that relies on large datasets collected through household surveys that demand a structured approach to questionnaire design and cannot rely on extensive interviewer probing to uncover inconsistencies.

The difficulties in collecting economic information has prompted analysts to propose useful shortcuts, especially asset indices based on ownership of simple durable goods like watches, televisions, and refrigerators. Deon Filmer and Lant Pritchett's well-known paper, "Estimating Wealth Effects without Expenditure Data-or Tears" (2001) proposes such an asset index in order to study the impact of household economic status on children's school enrollment. This highly influential paper has garnered nearly 2500 citations in Google Scholar, and similar asset indices used as the primary independent variable or as a control variable are now the standard approach for analyses of Demographic and Health Survey data.

After more than a decade of use, it is time to critically reflect on exactly what is measured by these asset indices and other measures of economic status. Several limitations of asset indices are important to note:

- Purchases of major household items are a matter of choice. Households may choose to invest in children's education or may buy a new color TV. Using asset indices to predict the education of children thus suffers from this endogeneity bias.
- Asset indices are sensitive to household size and do not take into account economies of scale.
- In some settings, many items in this index may be acquired through gifts or major life transitions, e.g. In India it is common to give a TV as dowry.
- Purchasing major items will depend on the local setting, e.g. there is little point in buying a TV if electricity supply is unreliable.

However, asset indices do enjoy advantages over alternative economic measures such as consumption expenditures or income even beyond their ease of data collection. Each alternative suffers from its own definitional and measurement challenges.

Income:

- Household income tends to be far more volatile than asset holding or consumption since households tend to smooth consumption expenditure over years, saving in years of surplus and borrowing or using up reserves when needed. This volatility is likely to be especially true in agriculturally-important economies in low- and middle-income countries.
- It is often difficult to define what counts as income, particularly when income is earned in-kind. For example, how do we value employee housing or meals given to employees? Indeed, is it possible to compute imputed rents where there is no rental market?
- For self-employed individuals, collecting both gross income and business or farm expenditures necessitates large and unwieldy questionnaires that induce respondent fatigue.
- There is a greater tendency for respondents to hide income than expenditures or assets, especially among wealthy households.

Consumption:

- Consumption totals depend on lists of items that are usually quite extensive. Items suited for upper income households may hold little relevance for lower income households. Respondent fatigue becomes a major issue for these questionnaires with long lists of consumption items..
- The reference period for which expenditures are collected influences the total values calculated. Research in India shows that a seven day recall period leads to higher reported expenditures than a 30 day recall period (Sen 2000).
- Expenditure data have their own sources of volatility. Weddings, funerals, and major illnesses will induce their own peaks of expenditures across recent reference periods that will distort the household's computed position within the sample.
- Expenditure reporting may vary with household size because one person reports expenditures made by all household members. This knowledge may be more problematic in the larger extended households common in many low- and middle-income countries. Expenditure reports may also vary depending upon the gender of the respondent with women knowing some categories better and men, others.
- Home produced goods that are consumed within the household are often difficult to identify and measure. If they are omitted or improperly recorded, greater bias may be found for agricultural households,

households that own livestock, or households who produce and repair many of their tangible possessions.

We usually expect these three markers of economic status – income, consumption expenditures, and asset indices – to be highly correlated. But only rarely are all of these dimensions collected in a single survey. The India Human Development Survey (IHDS; Desai, Dubey et al. 2010) is the rare survey that collected data on all three. The IHDS is a nationwide survey of over 41,000 households in 1503 villages and 971 urban blocks covering 33 states and union territories of India (excluding only the small island territories of Andaman-Nicobar and Lakshadweep). The IHDS was first conducted in 2004-5 and then the same households were resurveyed in 2011-12.

Earlier calculations from IHDS-I (Vanneman, Adams, and Dubey 2007) reveal the correlations between the three economic status measures to be only between 0.50 and 0.63. Worse, the consistency across measures varies systematically with the setting. For instance, the correlations are much lower for rural than urban areas.

Table 1 shows the distribution of IHDS-I households on asset quintiles according to their income and consumption levels. The results show that while lowest earning households own the fewest assets and highest earning households own the most, substantial variation is found within each income category especially in middle income categories. The same is true for overall consumption expenditure. Moreover, the link between income and assets is strongest for highest income groups; the link between consumption and assets is strongest for the lowest consumption groups. Even the lowest income households often own some assets, either because they received consumer assets in gifts or dowries or because they were purchased during times of higher incomes. On the consumption side, households with high consumption expenditure do not always spend money on purchasing consumer durables, they may well be spending money on children's education or health care.

Table 1: Relationship between Household Rankings Based on Income, Consumption, and Assets						
	Percent Household in Asset Ownership Quintiles					
	Lowest Assets	**2nd Quintile**	**3rd Quintile**	**4th Quintile**	**Most Assets**	
Ranking based on income						
Poorest	40.0	27.4	19.8	9.3	3.5	100
2nd Quintile	31.3	29.4	24.4	11.8	3.1	100
3rd Quintile	16.0	24.7	28.4	23.3	7.6	100
4th Quintile	6.7	12.9	26.6	32.7	21.2	100
Richest	0.8	3.4	11.1	25.7	59.1	100
Ranking based on Consumption Expenditure						
Poorest	48.4	28.6	17.2	5.1	0.8	100
2nd Quintile	25.6	30.0	27.0	14.6	2.8	100
3rd Quintile	14.0	20.9	29.6	26.4	9.1	100
4th Quintile	7.0	12.8	23.1	31.2	25.9	100
Richest	2.5	6.5	13.2	24.2	53.7	100

Finding a gold standard for the economic status of households may be impossible or undesirable for large surveys, but it is important to understand the strengths and weaknesses of each measure. For public policies on social assistance, understanding the differences is even more crucial. In many developing countries, welfare assistance is often based on proxy means testing, e.g., if a household is rich enough to afford a refrigerator, it is not poor enough to deserve welfare assistance. But what if rich households in villages without electricity choose not to buy a refrigerator? Does this make them deserving of welfare assistance? Better understanding of different markers of household economic status and potentials sources of bias would be of great use to future research designs as well as policy formation.

This paper uses unique follow-up data from IHDS-II and supplemental qualitative data for four villages in Northern India to address the following questions:

1. How reliably can we measure income, consumption and asset ownership data? When the same survey is administered twice within a year, do we get substantial variation in these three markers of economic well being?

2. If there is variation, is it due to some circumstantial changes or is simply due to measurement error?
3. How much of this error can be attributed to interviewer characteristics? Can skilled interviewers uncover errors of commission and omission and what is the extent of these errors?
4. How does household ranking based on these three markers correspond to household economic ranking employed using a Participatory Rural Appraisal method where village leaders are asked to rank households on their economic standing?
5. Do we "train" household respondents to respond to surveys either accurately or inaccurately? Are errors in surveys for households that are repeatedly surveyed greater than those for newly recruited households?

The paper will supplement information from the large IHDS-II survey with in-depth survey and qualitative work carried out in four North Indian villages to address the above questions. While survey results can provide estimates of the magnitude of some of these relationships, the qualitative interviews provide explanations for these patterns. Some of the observations from qualitative data are extremely informative:

Discrepancies between household income and expenditure: Rambabu and his family rely only on agricultural wage income and are generally able to find 400 days of work for all household members combined. They earned Rs. 45,000 in the year prior to survey. But their expenditure was Rs. 250,000 for the year before survey due to marriages of two daughters. They have been saving over the years to pay for this expense but a large proportion of finances came from borrowing from the local moneylender. This confirms that in some cases, when income is less than expenditure, the discrepancy may be due to life events that are of particular interest.

However, this is not routinely the explanation for discrepancies. In Krishna Kumar's household, when interviewers noticed significantly lower income than expenditures, they probed and discovered that the respondent had failed to mention landed income as well as a side business; when this income was included, the household moved from being in the red to being in the black.

Frequent Omission of Certain Types of Income: Remittance income is frequently ignored. When the follow-up in-depth interviews were conducted, in two households non-resident sons had returned for festival celebrations and noted that they had sent more money than the household had reported at the initial interview. Part of this omission is also due to lack of regularity in remittances. When remittances are sent monthly, the annual amount is easier to calculate than when they are sent irregularly or as needed.

Frequent Omission of Certain Types of Assets: Hari Mohan has given different information about the ownership of the land at two points of time during the first and second rounds of the survey. At the time of first round, he disclosed 30 Bighas of land and in the second round same respondent disclosed only 18 Bighas of land. At the time of the Participatory Rural appraisal for wealth ranking, the key village informants let us know that actually Hari Mohan's household owns 40 Bighas of land. Land ownership is a particularly sensitive interview topic in India because of land ceiling legislation.

Life Events that Lead to Unusual Income. Amarnath, a retired person, also receives remittances but these remittances are infrequent and irregular. The year before the survey, heavy expenditures were incurred for the education of the children so he utilized his savings and also took educational loans. He also had to take help from relatives. He said that at first he will try to manage on his own and when that is not possible he asks his sons to provide support as needed. This suggests that if the survey design is set up in a way where unusual life events are listed before income data are collected, both the respondent and the interviewer may be more sensitive to explore ways in which these events (marriage, illness, unusual educational needs) may influence the pattern of borrowing and selling land and other assets.

Rapport and Trust Building: Respondents are at times worried about the implication of revealing full income for access to government benefits and taxation. It is important to convince them that survey has nothing to do with the government. In the household of Kalawati, the first round respondent was her husband who did not report on all the land they owned as well as omitted mentioning ownership of a tractor that was frequently rented out and generated income. The second time around, the respondent was his wife and Kalawati was more comfortable trusting the interviewers and mentioned these assets. Ensuring respondent cooperation by making sure that they do not think that their responses will affect future benefits is important for both survey ethics and data quality.

We are in the process of undertaking detailed analyses of these qualitative data and will develop typologies of households where assets may or may not be good proxies for economic status. We hope to identify the types of households where external conditions may weaken the link between economic status and assets and thereby introduce misclassifications. These hypotheses will then be tested using survey data. We expect that these results will provide a better guide for future questionnaire construction as well as robustness check for results of demographic and health studies.

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