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Not your average job Measuring farm labor in Tanzania

The extent of bias in smallholder farm labor data is examined by conducting a randomized survey experiment amongst farming households in rural Tanzania. Benchmark agricultural labor estimates obtained from weekly surveys are compared to those from a traditional single end-of-season recall survey. Traditional recall-style modules overestimate hours worked per person per plot by a factor of 3.4. This recall bias is driven by the mental burdens of reporting on highly variable agricultural work patterns. All things equal, studies suffering from this bias would understate agricultural labor productivity

Measuring farm labor is important...

Of the 1.4 billion people living in extreme poverty, the vast majority resides in rural areas, relying on smallholder agriculture as a source of income and livelihood. The FAO estimates that Africa is home to 33 million small farms, holding less than two hectares and representing 80 percent of all farms. Farming practices are typically very labor intensive and the majority of the labor is provided by household members. Agricultural household labor is therefore a key household asset and its accurate measurement is important.

...but also complicated

The estimation of labor inputs on small-holder farms is complex and vulnerable to mis-reporting. Small-holder farms typically employ mostly family labor; thus, there is no wage income in which to anchor recall estimates. Written records are rarely kept and the respondent must rely on recall to report on past events. To arrive at the total amount of labor allocated by a household to farming, the household must accurately report the plots under cultivation, the specific household members that worked on each plot, the activities performed, and their timing and duration. Farming is a seasonal activity and work patterns are irregular during the season. Reporting “typical” or “average” time farming after the completion of the season requires remembering distant events and making complicated mental calculations. Alternatively, reporting hours worked in the last 7 days at any single point during the agricultural season will not necessarily be indicative of total labor during the season if labor inputs vary considerably across weeks during the season

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We conducted an experiment...

To study the accuracy of farm labor data in household surveys, we conducted a survey experiment during the main agricultural season (roughly January-June 2014) in the Mara district of Tanzania. A random sample of 854 households from 18 communities was randomly assigned to one of the following alternative survey designs:

1. Weekly Visit (benchmark): weekly face-to-face surveys for the duration of the season.
2. Weekly Phone (alternative): weekly phone surveys for the duration of the season
3. Recall Modules NPS (business-as-usual): single face-to-face survey at the end of the agricultural season. Two commonly used designs were tested.

...that shows labor recall modules lead to exaggerated labor input estimates

We establish the magnitude of bias by comparing the Weekly Phone and Weekly Recall groups to the Weekly Visit design. This is based on the premise that the figures reported in the Weekly Visit design are likely to be the closest to the “truth”. The table shows that the season-wide labor values reported in the weekly phone survey were close to the weekly face-to-face interviews, but the recall modules resulted in highly inflated estimates of total weeks and total days worked. However measures of labor based on hours per day, are exaggerated only slightly in the recall estimates. Based on this information on time use, we calculate number of hours worked per plot per person. Total hours worked per plot per person over the season is 3.4 times higher in the recall than in the weekly interviews. The phone survey performs better than recall-based methods, exaggerating hours worked only by a factor of 1.2.

...and we believe we understand why respondents misreport

The table shows that the bias in the total number of hours worked per plot per person is primarily driven by the reports of weeks and days worked, not from the reports on the hours worked per day. For the smallholders in our study, work schedules are both variable (that is, they are different from one week to another) and irregular (that is, there is no systematic or predictable pattern to the variability in work across weeks). Conditional on working that day, however, the number of hours worked is relatively regular (typically from 7am to 11am). From the social and cognitive psychology literature we know that the strategy a respondent uses to come up with an answer to a question on the frequency of occurrence of an event will depend on, among other things, the regularity and salience of that event. Salient events can be recalled and counted, whereas regular events can be estimated using rate-based estimation techniques, even if these events are not salient. Being neither salient nor regular respondents are not able to make use of rate-based or recall and count strategies when reporting on farm labor, leading to erroneous reports.

Read more in this working paper:

<http://documents.worldbank.org/curated/en/685941469741403223/Not-your-average-job-measuring-farm-labor-in-Tanzania>

This has implications for survey design...

Clearly survey designers should tread carefully when asking questions about the frequency of non-salient and irregular events. But what is the alternative? The benchmark Weekly Visit approach used here is expensive and unlikely to be a realistic prospect given the degree of scaling up necessary for national labor surveys. A result that comes out strongly in this study is the encouraging performance of the phone surveys, which show little difference from the results obtained in the benchmark Weekly Visit design. While this mobile phone alternative performed well, it is nevertheless expensive in comparison to current end-of-season recall approaches. To wit, one round of mobile phone surveys cost 6% of the baseline survey. Thus, adding the 25 rounds of mobile phone surveys (needed to capture an entire main rainy season at weekly frequency) to an existing survey would increase costs by 135%. There clearly remains scope for innovation in the accuracy-feasibility tradeoff.

...as well as for the debate on agricultural productivity

Finally, our results have implications for the debate on why value added per worker is so much lower in the agricultural sector than in the nonagricultural sector – and how such a difference can be sustained in the long-run. Our results suggest that measurement and data quality may be especially important here. Studies suffering from similar recall bias would overstate how much people work on farms, which, *ceteris paribus*, leads to underestimates of labor productivity on these farms.

Table: Family Farm Labor Inputs (per person, per plot), as reported by different survey designs.

| | Weekly Visit (benchmark) | Phone (alternative) | Recall (business-as-usual) |
|--|-----------------------------|------------------------|-------------------------------|
| Reported Days | 9.2 | 10.7 | 27.8 |
| Reported Weeks | 2.5 | 2.6 | 5.7 |
| Reported hours per day worked | 4.1 | 4.4 | 4.6 |
| TOTAL HOURS WORKED (calculated) | 39.5 | 48.8 | 133.8 |