

Measuring Household Usage of Financial Services: Does it Matter How or Whom You Ask?

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In recent years, the number of surveys on access to and use of financial services has multiplied, but little is known about whether the data generated are comparable across countries or within the same country over time. A randomized experiment in Ghana tested whether the identity of the respondent and the inclusion of product-specific cues in questions affect reported rates of use of financial services. Rates of household use are almost identical whether the head reports on behalf of the household or whether the rate is tabulated from a full enumeration of household members. A less complete summary of household use of financial services results when randomly selected informants (nonheads of household) provide the information. For credit from formal institutions, informal sources of savings, and insurance, reported use is higher when questions are asked about specific financial products rather than about the respondent's dealings with types of financial institutions. In short, who is asked the questions and how the questions are asked both matter.

By now, the link between financial sector depth and economic growth is well established.¹ Most studies rely on aggregate measures of deposits and loans in the formal financial system, predominantly through banks.² Because aggregate measures, such as the ratio of credit extended to the private sector to GDP, do

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1. See Beck, Levine, and Loayza 2000; Levine 2005; Levine, Loayza, and Beck 2000; Levine and Zervos 1998; and Rajan and Zingales 1998.

2. See Beck, Demirgüç-Kunt, and Levine (2000) for an overview of measures of financial sector depth and their construction.

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not provide information about the average size of a loan (or deposit), they give an imperfect sense of the reach of the financial sector. A highly concentrated banking sector, in which a small number of relatively wealthy depositors and borrowers are responsible for a large share of banking activity, could score comparatively well on financial depth while having limited breadth of outreach.

There are reasons to be concerned about breadth of outreach, especially in developing countries. Informational asymmetries, transaction costs, and contract enforcement costs lead to market imperfections that disproportionately disadvantage the poor, who tend to lack collateral, credit histories, and connections (Levine 2005; World Bank 2007). And recent studies have established a link between financial sector development and poverty alleviation (Beck, Demirgüç-Kunt, and Levine, 2007; Clarke, Xu, and Zou, 2006; Honohan 2004).

Perhaps the major reason why financial sector breadth has been understudied is the difficulty collecting data.³ Whereas measures of financial depth can be derived from the balance sheets of financial institutions that already furnish this information to supervisors such as central banks, the same information is not readily available for financial sector breadth and certainly not in a consistent format across countries. Recent attempts to collect data on financial sector breadth have pushed beyond balance sheet information, using both demand- and supply-side approaches.

On the supply side, measures of financial sector outreach often focus on the number of accounts of providers of financial services. For example, Beck, Demirgüç-Kunt, and Martinez Peria (2007) collected information on the aggregate number of deposit and loan accounts from bank regulators in 99 countries. They also collected information on the number of bank branches and automated teller machines (ATMs) in each country as a proxy for physical access to financial services, even among those who do not use them. A limitation of those data is that they are derived only from information about banks, which, while important or even dominant providers of financial services in many countries, are not the full story. Honohan (2008) combines the commercial bank accounts from Beck, Demirgüç-Kunt, and Martinez Peria with accounts at microfinance institutions (from Christen, Jayadeva, and Rosenberg 2004) and at savings banks that are members of World Savings Bank Institute (from Peachey and Roe 2006) to produce the most comprehensive, though admittedly still rough, accounts-based estimates of access to date. While this represents a step forward, the accounts-based approach provides little information about the account holders and thus about financial exclusion in a given country.

A more satisfying, but costlier, approach is to interview users and potential users of financial services through surveys of individuals and households. Broadly speaking, there are two approaches: stand-alone surveys on access to

3. See World Bank (2007) for a discussion.

financial services, which tend to be relatively expensive but produce rich data sets and a detailed portrait of access, and a small module of questions on financial access and use that is embedded within a larger survey designed to cover another topic (such as surveys of household expenditures or labor market participation) or multiple topics (as in the Living Standards Measurement Study (LSMS) surveys). The marginal cost of the modules is much lower than that of stand-alone surveys, but they yield data that are much less rich.

Neither approach has produced comparable financial use data at regular intervals that could be used to monitor the situation in a given country over time or to compare outreach across many countries. Because the stand-alone surveys are costly, they tend not to be repeated at regular intervals, and when they are eventually repeated, the sampling frame and questions may differ or a different organization may conduct the survey. In surveys designed for a different purpose, modules of financial questions tend not to be given high priority, and comparability of data across surveys occurs largely by chance. A recent summary of the financial information generated in the LSMS shows that only a handful of basic questions about accounts and loans are asked in most modules, and those are often asked in different ways, making the validity of comparisons across surveys dubious (Gasparini and others 2004).

While the accounts-based and survey-based measures of use of financial services are not substitutes, recent research has found a robust statistical link between them (Beck, Demirgüç-Kunt, and Martinez Peria 2007; Honohan 2008). Thus, a regression model constructed from the more readily available accounts-based information can be used to generate reasonably accurate estimates of the harder to collect survey-based data. Still, the fit of these regressions is not perfect. For example, Honohan (2008) estimates that 16 percent of Ghanaians have an account, whereas the information derived from the survey described below places that figure at 25 percent. At best, it would appear that the estimates derived from accounts-based information could be used to monitor access between surveys of users.

Scaling up data collection on use of financial services to ensure accuracy and comparability across countries and over time would therefore require a survey-based approach. While there have been other stand-alone efforts to measure use, the most advanced current one is that by the FinMark Trust, which has deployed its FinScope survey (www.finscope.co.za) in several developing countries, primarily in Africa.⁴ FinScope surveys are designed to provide nationally representative information on individuals' use of financial services. The questions are similar to those that might be found in a marketing study, including detailed inquiries about specific types of financial products. These questions are supplemented by others on respondents' attitudes toward financial institutions, risk, and coping strategies in times of economic hardship, among other issues.

4. The FinScope website lists ongoing or completed surveys for 14 African countries and Pakistan.

By contrast, the most comprehensive effort to use the modular approach to measure use, the LSMS, tends to ask broad, generic questions about “credit” or “accounts” or dealings with types of financial institutions. Another important difference between the FinScope and LSMS approaches is that the LSMS finance modules track household use of financial services, whereas FinScope randomly selects individuals from the population to provide information only on their own use.

In light of these differences, a randomized experiment was devised to test whether measured use of financial services is similar when respondents are asked detailed product-based questions (the FinScope approach) or are asked more generic, institution-based questions (the LSMS approach). The two approaches are found to yield similar estimates for basic products such as savings accounts with banks or other formal providers but not for others such as insurance or credit provided by banks and other institutions.

These comparisons are potentially important because the expense of stand-alone surveys makes it unlikely that they will be rolled out throughout developing countries any time soon. The results in this article provide guidance on the product- and institution-based questions that yield similar estimates of use, and they suggest ways that generic, institution-based questions used in finance modules could be modified to produce similar estimates of use for products such as insurance and formal credit.

For household use of financial services, an important consideration is whether the identity of the survey respondent affects the accuracy of the information received. The most comprehensive approach to measuring household use is a full enumeration: each member of the household reports on personal use of financial services, and individual responses are then aggregated to the household level. Other approaches use an informant to provide information on the use of financial services by all members of the household, typically either the head of household or a randomly selected adult. Another part of the experiment, therefore, tests whether the household financial use information provided by the household head or a randomly selected informant is as accurate as that provided by a full enumeration. Because a full enumeration is more time consuming, these results can indicate the services for which informants can provide reliable, cost-effective information.

Section I describes the experimental design, and section II compares the characteristics of the sample with that of the full Ghana LSMS—only a subset of households were re-visited, though the sample was designed to be nationally representative. Sample characteristics are also compared across treatment groups. Section III reports rates of use across financial products for product- and institution-based questions and household use rates provided through full enumeration and through a randomly selected informant. Section IV introduces regressions to test whether certain types of individuals and households are responsible for the under-reporting of access found for some questionnaire formats. Section V offers concluding remarks.

I. THE DESIGN OF THE EXPERIMENT

Household surveys vary across multiple dimensions as tradeoffs are made among respondents, data quality, and cost.

Choice of Respondents

For financial (and other) surveys, an important dimension is the choice of respondents. Heads of household, however defined, are often selected because they are considered knowledgeable, other elements of the survey require their personal information, and selecting one person to provide data at the household level saves time and resources. LSMS surveys had traditionally collected information this way. However, a review of the surveys suggested that the head of household may not be aware of all the services used by household members and that relying on this one informant could lead to underestimation of some types of service use and of overall household use (Kochar 2000; Scott 2000). More recent LSMS surveys have moved to direct informants (full enumeration) for financial information.

A third option is to randomly select one adult per household, the sampling technique used in the FinScope surveys, whose goal is to achieve a probability selection of adults in the country. Logistically, it would be easiest to have this informant provide the household-level data if such data were desired. The question is whether this strategy would provide data of similar quality to that from full enumeration of adults or from the head of household. It is not clear, a priori, that every individual in the household will be equally well informed about other members' financial sector involvement.

Aggregation of Questions

A second key dimension on which surveys vary is the level of aggregation of questions. A short set of highly aggregated questions can reduce costs, simplify fieldwork, and lessen the burden on respondents. The LSMS surveys have used this method, asking about financial service use at an aggregate level with a greater focus on relationships with types of financial service providers than on products used. There is a concern that some services might be missed using this approach, however. Research in other areas has shown that such aggregation may lead to accidental omissions or memory lapses, thus lowering reported incidence or use. Experiments in measuring household consumption have certainly shown this to be the case (Joliffe 2001; Pradhan 2001; Steele 1998; STATIN 1994).

The opposite approach is to ask respondents about each financial service or product available. This approach, taken in the FinScope surveys, should prevent accidental omission of service use. It does, however, increase the burden of the interview, which can lead to lower data quality. It also may preclude multitopic surveys from addressing financial service use as there simply is not space or time for so many questions.

The Ghana Experiment

The experiment carried out in Ghana explicitly tests the effect of changing the respondent and changing the set of questions on financial service use. The Ghana Statistical Service (GSS) collaborated with the authors in developing and administering a financial services survey to a subsample of households in the Ghana Living Standards Study (GLSS5) survey. To augment GSS's own survey experience, the GSS called on experts and other sources in the country to compile a comprehensive list of financial services and service providers. The GSS staff also determined the best terminology and strategies for minimizing translation problems, prepared training materials, and trained interviewers.

The financial services survey, by revisiting GLSS5 households, was able to take advantage of the rich data already collected from those households. This released many constraints on the experiment survey and allowed a more complex design: interviewers needed only to be trained on financial questions and data collection. And more risks could be taken because the government's national survey was in no way at risk from the work (since households were visited after the GLSS5 was finished).

The original framework for the experiment was a three by two matrix—three types of respondents (head, randomly selected adult, and full enumeration) and two types of questionnaires (product-based and institution-based). This framework was determined to be too complex for ensuring quality in the fieldwork. A simplified, feasible design was drawn up that still allowed comparison on the two main issues of interest: the quality of household use information provided by informants compared with a full enumeration and the quality of data obtained using a product-based questionnaire compared with an institution-based one.

Physically, three different questionnaires were fielded, with the second and third questionnaires containing more than one treatment (table 1). Households were randomly preassigned to one of three groups with each group being administered a different questionnaire. In households where one of the treatments was for a randomly selected adult to be interviewed, interviewers used Kish tables to make that selection in the field.⁵ Only individuals ages 15 or older were surveyed.

The same information was not obtained across all households. Collecting financial services use information for individuals and households differs. An individual respondent can provide information about other household members only insofar as the respondent knows about their financial activities.

5. Use of a Kish table enables interviewers with a sample of household addresses (in this case the 15 houses in each enumeration area) to randomly sample individuals on the doorstep by following a simple rule for selecting one household resident to interview. A list of eligible individuals at a particular address is ordered by age, and then one person is selected according to the serial number of the address. All individuals in a household have an equal chance of selection, resulting in a representative sample of all individuals in a population.

Knowledge of one's own use is more a matter of straight reporting and thus offered a cleaner test of whether including product cues in questions yields higher use rates than using institutional questions alone. Overlaying the product/institutional treatments on the household use experiment would have made it more difficult to distinguish the effects of question format from those of the quality of the respondent's knowledge.

Once the decision was made to separate the household use and individual use experiments, issues arose about the optimal sequencing of treatments within the same visit to a household. One issue was repetition. In general, it was preferable not to have the same individual respond first to institutional and then to product-based questions about their personal use of financial services, for two reasons. Respondents might grow impatient at the repetition, and their answers about financial use under one question format might influence their subsequent responses under the other format.⁶ The time spent interviewing a household also affected the design of the experiment. For households in group 1, in which all members answered the longer, product-based questions, visit length was a concern. Also, multiple visits to the same household were often necessary to collect information from all members. For those reasons, institution-based questions were not added to the group 1 questionnaire. This also would yield a group of responses for which the sequencing concerns described above would not be relevant.

The GLSS5 households included in the financial services survey were taken from the last two GLSS5 interviewing cycles, which were closest in time to the fielding of the experiment. This was done to minimize the chances that a household might have changed significantly between surveys, since the study relies on the GLSS5 data for nonfinancial information on households and individuals. The selected enumeration areas (and households) were distributed throughout the country (table 2). The instruments were piloted and revised, and the survey took place over October–December 2006.

6. The only time such repetition occurred was for households in group 2 (see table 1), in which all household members were first asked about their own use of financial services, using the institution-based questions. Then a member of the household was randomly selected to answer the more detailed product-based questions. Members were told that because the product-based questions were more time consuming, it made sense to have only one person answer them. While this seemed to be a natural transition, concerns remained that answering the institutional questions first might influence the selected member's product-based responses. This could be checked by comparing responses with those from group 1, which asked all household members only product-based questions. The product/institutional comparisons are very similar whether the group 2 product-based responses from the randomly selected household members are included or not. Thus, the results for product-based use questionnaires are reported for both groups 1 and 2. The product-based information from group 3 was excluded, however, in constructing the tests because the sampling procedure within households was not random: first the household head was interviewed, and then a randomly selected nonhead was interviewed. Again, however, inclusion of the group 3 observations does not greatly affect the comparisons between the product and institutional question formats.

TABLE 1. Questionnaire Treatments

Respondent	Questionnaire administered	
	Product	Institutional
Head of household	Group 3 (n = 659 households) Answers institution-based questions about household use in first section; answers product-based questions about individual use in second section.	
Randomly selected adult	Group 2 (n = 643 households) Answers product-based questions about individual use.	Group 3 (n = 659 households) Answers institution-based questions about household use in first section; answers product-based questions about individual use in second section.
All adults (15 and older)	Group 1 (n = 653 households, 1,570 individuals) All household members answer product-based questions about their own use.	Group 2 (n = 643 households, 1,568 individuals) All household members answer institution-based questions about their own use.

Note: Each group represents a different questionnaire.

TABLE 2. Enumeration Areas from the Ghana Living Standards Study 5 Used for Financial Service Survey Sample

Region	Ghana Living Standards Study 5, Cycle 10		Ghana Living Standards Study 5, Cycle 11		Total
	Urban enumeration area	Rural enumeration area	Urban enumeration area	Rural enumeration area	
Northern	1	5	0	6	12
Upper East	1	2	0	3	6
Upper West	0	3	0	3	6
Ashanti	3	6	3	6	18
Eastern	2	4	2	4	12
Brong Ahafo	2	4	0	6	12
Volta	0	6	0	6	12
Western	4	2	3	3	12
Central	6	0	4	2	12
Greater Accra	6	3	8	1	18
Total	25	35	20	40	120

Source: Table prepared by Ghana Statistical Service based on GSS (2006).

II. DESCRIPTION OF THE DATA

The final sample contained 1,955 households. Efforts were made to ensure that the experiment's results could be extrapolated to the entire population and did not apply only to the households included in the survey. The sample of households for the financial services survey was a random subsample of the GLSS5 sample, itself a probability sample (GSS 2006). This simple random sample of enumeration areas, however, failed to take into account the larger population in urban enumeration areas that was captured in the original probability proportional to size sample. This shows up in variables related to location: the financial services survey sample deviates slightly from the GLSS sample in being more rural, having more households engaged in agriculture, and being more likely to be located in the Coastal and Forest Zones of the country (table 3). The effects are not strong, but it should be remembered that the sample somewhat overrepresents the rural population.

Sample attrition was a second potential area of bias. The financial survey is essentially a panel survey. Of the 2,291 households revisited, 336 could not be reinterviewed.⁷ This is a problem only if there are systematic differences between the households that could and those that could not be reinterviewed. A probit model in which the dependent variable takes a value of one if the household was not reinterviewed and zero otherwise found that rural households and households with older heads were less likely to be lost between rounds. The sample may therefore underrepresent more mobile households, and the attrition reinforces the slight bias toward rural households arising from the original selection of enumeration areas. These tendencies also need to be kept in mind when drawing conclusions from the data.

Finally, the allocation of households to questionnaire groups could be a concern. Comparing the means of key variables across the three groups is reassuring on this point (table 4). The only problem area might be that households in group 2 are slightly smaller than households in the other two groups, on the order of 0.25 fewer people per household. While the difference is statistically significant, it is small and unlikely to have any effect on the results.

III. BASIC COMPARISONS ACROSS TREATMENTS

For the institution-based questions asked of a household informant (either the head of household or a randomly selected adult that is not the head), seven indicators of the use of financial services were calculated, listed here with the survey questions from which they are derived:

7. Fifty percent of the nonresponses were due to vacant dwellings (either permanent or temporary) and 40 percent to households that had moved. Refusals to participate represented less than 3 percent of nonresponse.

- (1) *Banked*: Some people like to keep their money in an account with a bank. Do you or any member of your household have a bank account?⁸
- (2) *Indirect access to an account*: Do you or other members of your household perform banking transactions using someone else's account?⁹
- (3) *Formal nonbank savings*: Now think of all the ways that you and members of your household save money. We are not talking about investing in a business or buying land, but only about where you or other household members put their money to use later. Have you or anyone in your household used an institution such as a credit union or a savings association to save money in the past 12 months?
- (4) *Formal credit*: Many people borrow money to buy things on credit. Have you or any other member of your household used an institution such as a credit union, savings association, or bank to borrow money or to buy on credit in the past 12 months?
- (5) *Informal savings*: Have you or any other household member used a Susu,¹⁰ welfare scheme, or other savings club to save money in the past 12 months?
- (6) *Informal credit*: Have you or any member of your household used a Susu, welfare scheme, or savings club to borrow money in the past 12 months?
- (7) *Insurance*: Many people insure themselves and their possessions against unexpected circumstances. Have you or any member of your household used an institution to insure yourselves (life, health) or property (household goods, house, vehicle, and the like) in the past 12 months? That is, do you or anyone in the household have any long- or short-term insurance policies with any institution?

The same indicators were calculated and the same questions were asked for the full enumeration treatments but for individual use. For example, for the

8. To help respondents distinguish banks from other financial service providers, interviewers received a list of the banks operating in Ghana and a glossary of definitions of financial terms, including for example, "microfinance: small-scale loans typically given to owners of microenterprises to cover business expenses including small-scale investments, though the loan proceeds can be used for nonbusiness purposes including consumption. Liability for loan repayment can apply only to the borrower (individual-based) or to a solidarity lending group to which the borrower belongs. Under solidarity group lending, group members have strong incentives to ensure that fellow group members repay their loans. Some, but not all, microfinance institutions in Ghana also provide savings services to their members." Observations of interviews in the field indicated that respondents had little trouble identifying banks.

9. "Someone else" could be either a family member or a nonfamily member. In either case, the household would be considered "banked." If the response was that neither the respondent nor any member of the household had a bank account but that the respondent (or another household member) did banking transactions through someone else's account, it could be inferred that the "someone else" was not a family member. This occurred rarely.

10. For a small fee, Susu collectors provide a secure, informal means for Ghanaians to save and access their own money and to gain some limited access to microcredit.

TABLE 3. Descriptive Statistics: Full Ghana Living Standards Study 5 Sample and Subsample Used in the Financial Services Survey

Variable	Ghana Living Standards Study 5 full sample mean	Financial Services Survey subsample mean	t-test of equivalence of means
<i>Region</i>			
Coastal	29.65 (45.68)	33.12 (47.07)	3.21 (0.00)
Forest	40.83 (49.15)	38.87 (48.76)	1.70 (0.09)
Savannah	29.52 (45.61)	28.01 (44.91)	1.41 (0.16)
Rural	58.35 (49.30)	62.35 (48.46)	3.46 (0.00)
<i>Household characteristics</i>			
Female household head	27.88 (44.84)	28.62 (45.21)	0.70 (0.48)
Head of household literate	47.79 (49.95)	44.35 (49.69)	2.94 (0.00)
Head of household numerate	64.24 (47.93)	64.16 (47.96)	0.06 (0.95)
Age of head of household	45.34 (15.63)	45.51 (15.64)	0.46 (0.65)
Extended family	26.82 (44.31)	27.97 (44.89)	1.10 (0.27)
Household size	4.20 (2.83)	4.22 (2.87)	0.24 (0.81)
Household has agricultural worker(s)	65.10 (47.67)	69.50 (46.05)	3.96 (0.00)
Household has self-employed worker(s)	69.59 (46.01)	70.72 (45.51)	1.06 (0.29)
Household has employed worker(s)	23.56 (42.44)	23.56 (42.45)	0.00 (1.00)
<i>Individual characteristics</i>			
Age	19.62 (19.56)	24.04 (24.19)	0.66 (0.51)
Male	48.69 (49.98)	49.31 (50.00)	1.08 (0.28)

Note: Numbers in parentheses are standard deviations for sample means and p-values for t-statistics.

Source: Authors' analysis of survey data.

banked indicator, the question was simply: "Do you have a bank account?" Responses are aggregated across all members of the household to arrive at the measure of household use. In other words, if one member of the household reports having a bank account, then the whole household is considered banked for the full enumeration treatments.

An element of subjectivity went into the crafting of these questions, and one might worry that slight tinkering with the institution-based questions could

TABLE 4. Region and Household and Individual Characteristics across Treatment Groups

Treatment group	Means			t-tests of equivalence of means		
	Group 1	Group 2	Group 3	Groups 1 and 2	Groups 2 and 3	Groups 3 and 1
<i>Region</i>						
Coastal	30.5 (46.1)	29.6 (45.7)	29.3 (45.5)	0.37 (0.71)	0.12 (0.90)	0.49 (0.62)
Forest	40.6 (49.1)	41.4 (49.3)	40.2 (49.1)	0.30 (0.76)	0.45 (0.65)	0.15 (0.88)
Savannah	28.9 (45.3)	29.0 (45.4)	30.5 (46.1)	0.05 (0.96)	0.60 (0.55)	0.65 (0.51)
Rural	64.4 (47.9)	65.0 (47.7)	65.7 (47.5)	0.20 (0.84)	0.28 (0.78)	0.49 (0.63)
<i>Household characteristics</i>						
Female household head	26.4 (44.1)	28.8 (45.3)	29.7 (45.7)	0.97 (0.33)	0.37 (0.71)	1.34 (0.18)
Head of household literate	41.8 (49.4)	41.4 (49.3)	43.9 (49.7)	0.15 (0.88)	0.88 (0.38)	0.74 (0.46)
Head of household numerate	63.5 (48.2)	60.7 (48.9)	62.8 (48.4)	1.03 (0.31)	0.77 (0.44)	0.26 (0.80)
Age of head of household	46.0 (15.5)	46.4 (15.7)	46.5 (15.1)	0.39 (0.70)	0.17 (0.87)	0.57 (0.57)
Extended family	29.6 (45.7)	28.0 (45.0)	30.8 (46.2)	0.63 (0.53)	1.09 (0.27)	0.47 (0.64)
Household size	4.50 (2.86)	4.24 (2.92)	4.59 (2.98)	1.63 (0.10)	2.15 (0.03)	0.56 (0.57)
Household has agricultural worker(s)	72.7 (44.6)	71.2 (45.3)	71.9 (45.0)	0.60 (0.55)	0.30 (0.77)	0.30 (0.76)
Household has self-employed worker(s)	73.3 (44.6)	75.1 (43.3)	74.4 (43.7)	0.74 (0.46)	0.30 (0.76)	0.44 (0.66)
Household has employed worker(s)	22.6 (41.9)	21.7 (41.2)	21.4 (41.0)	0.41 (0.68)	0.11 (0.91)	0.52 (0.60)
<i>Individual characteristics</i>						
Age	23.7 (19.6)	24.3 (20.0)	23.7 (19.6)	1.10 (0.27)	1.13 (0.26)	0.02 (0.98)
Male	49.4 (50.0)	49.1 (50.0)	49.2 (50.0)	0.19 (0.84)	0.04 (0.97)	0.15 (0.88)

Note: Numbers in parentheses are standard deviations for sample means and p-values for t-statistics.

Source: Authors' analysis of survey data.

increase reported levels of use. Considerable work with GSS staff to adapt these questions to the country context and extensive piloting of the questions (both at GSS and in the field) helped ensure that the questions were well understood by respondents. Thus confidence is high that these questions represent a reasonable and fair attempt to gather data on financial service use in Ghana

TABLE 5. Percentage of Households That Use Financial Services

Survey type	Banked	Indirect access	Formal nonbank saving	Formal credit	Informal savings	Informal credit	Insurance
<i>Sample means (percent)</i>							
Head of household (n = 638)	26.5 (1.7)	6.4 (1.0)	3.0 (0.7)	3.3 (0.7)	19.7 (1.6)	4.2 (0.8)	11.3 (1.3)
Random household member (n = 480)	10.0 (1.4)	3.3 (0.8)	1.7 (0.6)	1.5 (0.5)	17.7 (1.7)	4.2 (0.9)	10.6 (1.4)
Full enumeration (n = 643)	25.5 (1.7)	5.1 (0.9)	2.5 (0.6)	1.9 (0.5)	17.3 (1.5)	4.2 (0.8)	7.9 (1.1)
<i>t-tests of equivalence of means</i>							
Head or random household member	7.05 (0.00)	2.33 (0.02)	1.41 (0.16)	1.94 (0.05)	0.86 (0.39)	0.05 (0.96)	0.35 (0.73)
Head or full enumeration	0.40 (0.69)	0.99 (0.32)	0.54 (0.59)	1.61 (0.11)	1.15 (0.25)	0.03 (0.98)	2.04 (0.04)
Full enumeration or random household member	6.69 (0.00)	1.46 (0.14)	0.94 (0.35)	0.52 (0.60)	0.19 (0.85)	0.03 (0.98)	1.55 (0.12)

Note: Numbers in parentheses are standard deviations for sample means and p-values for t-statistics.

Source: Authors' analysis of survey data.

through institution-based questions. Moreover, in the first set of comparisons between full enumerations and informants, all respondents were asked the same questions. While use levels might be affected by the specifics of those questions, any differences in the data generated by a full enumeration and that gathered from informants are much less likely to be affected.

For five of the seven indicators—*banked*, *indirect access*, *formal nonbank savings*, *informal savings*, and *informal credit*—household use rates are almost identical when the head of household is the informant and when a full enumeration is undertaken (table 5). For *formal credit*, use rates reported by the head of household are slightly higher than those from the full enumeration treatments, though the hypothesis that the two rates are equal to one another cannot be rejected. Overall, the head of household reports information that is very similar to that generated by full enumeration.

This is good news. Interviewing the head only is much cheaper than interviewing all adult members of a household, an issue returned to below. However, some surveys with a financial services module, such as labor force participation surveys, are designed to interview all members of a household. The results are good news in those cases, too. The information generated through the full enumeration appears to be a reasonable substitute for that generated by the head of household. Because the household use rates calculated from responses to institution-based questions are comparable using either method, valid comparisons could be made across a much broader set of countries.

In contrast, a randomly selected adult from the household (who is not the head) does not provide information that is comparable to that generated by the head or by full enumeration. Randomly selected informants produce use rates that are lower than those for the other two methods and significantly lower for *banked*, *indirect access*, and *formal credit*. This pattern suggests that the random informant has substantially less knowledge about household use of financial services than does the head of household. Disparities are greatest for services provided by formal institutions. For both *informal savings* and *informal credit*, the use rates produced by random informants are almost identical to those produced by the head of household or through full enumeration. This could be because many informal savings and credit arrangements involve social activities (meetings) that all household members know about.

Although the head of household respondents and the full enumeration tend to yield very similar use rates, *insurance* is an exception. One would expect the full enumeration to provide the most complete information and thus produce the highest use levels. And yet the percentage of households that have insurance is reported at 11.3 percent when information is provided by the head of household and 7.9 percent when it is collected through a full enumeration of individual use. It is conceivable that the head of household has purchased insurance for other household members of which those members are not aware. Another issue, turned to in more detail below, is that the institution-based question is a poor method of collecting information on insurance use, and therefore that none of the estimates for that indicator reported in table 5 is reliable.¹¹

Comparisons of use rates calculated from product- and institution-based questions also reveal stark differences across indicators. The product-based questions are similar to those used in FinScope surveys. For example, a respondent who answered yes to any of the following questions was considered *banked*:

11. Recall that the head of household is asked only about his or her own personal use of insurance products in the full enumerations, and thus it is possible that the full enumeration could yield a smaller average use rate than when the head responds on behalf of the household, for the reason mentioned. However, observations of field training suggest that an institution-based question is simply not a good method for collecting reliable information about insurance use.

- (1) Do you currently have an ATM card?
- (2) Do you currently have a debit card?
- (3) Do you currently have a Savings Plus account?¹²
- (4) Do you currently have a current account (checking)?
- (5) Do you currently have a savings account at a bank?
- (6) Do you currently have a PostBank account or a post office savings account?
- (7) Do you currently have a bank loan?
- (8) Do you currently have a bank overdraft facility?

The questions underlying each indicator appear in the appendix. Note that there is no product-based indicator for *indirect access* since there was only one question on that topic and it was asked in the same way in both the product-based and institution-based questionnaires. That indicator is therefore dropped from subsequent tables.

As noted, the focus is on individual use of financial services so as not to confound the effects of the method of eliciting household use information (informant or full enumeration) with the effects of asking product- or institution-based questions. Again, while some degree of subjectivity entered into the selection of questions underlying the product-based indicators of financial services use, care was taken to adapt those questions to the country context. And many questions were selected from those used in past FinScope surveys. This should therefore constitute a fair test of the importance of asking product-based questions in the sense that it well represents the most advanced surveys undertaken to date.

Product- and institution-based questions produce very similar use rates for basic services, such as *banked* and *formal saving* (*banks + nonbanks*; table 6). By contrast, the product-based questions yield much higher use rates than do the institution-based questions for *formal credit* (2.8 percent and 0.8 percent), *informal savings* (18.8 percent and 8.9 percent), and *insurance* (16.3 percent and 5.7 percent), and all of the differences are statistically significant. For these arguably more complex financial services, product-related cues appear to produce a much more complete picture of use.

A surprising result is that reported use of informal credit is higher for institutional than for product-based questions. This is because the product-based question on informal credit was poorly designed. It explicitly mentioned Susu's, welfare schemes, and savings clubs, which mirrors the institutional question. The single institutional question asked about the past year, while the product-based questions asked about current use and whether such services had ever been used. To be consistent across the product-based indicators, only current use should be considered. However, because the institutional question

12. This is the brand name of a specialized savings account offered by some Ghanaian banks with additional features such as limited checking.

TABLE 6. Percentage of Individuals Who Use Financial Services, by Product and Institutional Questions

Survey type	Banked	Formal saving (banks + nonbanks)	Formal credit	Informal savings	Informal credit	Insurance
<i>Sample means (percent)</i>						
Questions on use of products (n = 2,201)	14.3 (0.7)	14.2 (0.7)	2.8 (0.4)	18.8 (0.8)	0.7 (0.2)	16.3 (0.8)
Questions on use of institutions (n = 1,568)	13.3 (0.9)	13.8 (0.9)	0.8 (0.2)	8.9 (0.7)	2.2 (0.4)	5.7 (0.6)
<i>t-tests of equivalence of means</i>						
Products or institutions	0.88 (0.38)	0.39 (0.70)	4.32 (0.00)	8.49 (0.00)	3.97 (0.00)	10.04 (0.00)

Note: Numbers in parentheses are standard deviations for sample means and p-values for t-statistics.

Source: Authors' analysis of survey data.

asks about the past year and because users switch in and out of these services regularly, the product-based question produces a lower use rate than the institutional question, which is misleading. The construction of the questions on informal credit does not therefore permit meaningfully comparing product and institutional questions.¹³

By definition, the level of individual use of financial services would not be expected to exceed the level of household use. The results show that this is true for all services except for *insurance* (compare tables 5 and 6). For that indicator, the individual use rate based on product-related questions far exceeds the household use rate calculated from the institution-based question. This shows that the institutional insurance question is not a good substitute for a series of product-related questions.

13. At the same time, use rates for semiformal and other informal credit services reveal some interesting patterns. First, 4.7 percent of respondents said that they were currently using a hire purchase or installment credit plan, while an additional 8.1 percent reported that they were using credit facilities other than bank loans, credit cards, hire purchase, or installment plans. These are sizable fractions in a country where only about a quarter of households are banked. It suggests that if institutional questions had targeted the providers of such facilities, a meaningful institutional-product comparison could have been made, one that likely would have tipped in favor of product-based questions. Still, it is hard to identify the providers of such facilities for a survey respondent without also defining what those facilities are. Indeed, field tests showed that interviewers needed to explain some of these concepts in depth to respondents. For informal credit, therefore, it might not be possible to separate institution- and product-based descriptions sufficiently to construct a test.

TABLE 7. Percentage of Individuals Who Use Financial Services, by Product and Institutional Questions and Respondent Type

Survey type	Banked	Formal saving (banks + nonbanks)	Formal credit	Informal saving	Informal credit	Insurance
<i>Sample means (percent)</i>						
<i>Household heads</i>						
Questions on use of products (n = 978)	22.8 (1.3)	22.7 (1.3)	4.6 (0.7)	21.9 (1.3)	0.7 (0.3)	17.8 (1.2)
Questions on use of institutions (n = 638)	23.8 (1.7)	24.5 (1.7)	1.4 (0.5)	12.7 (1.3)	2.7 (0.6)	7.5 (1.0)
<i>t-tests of equivalence of means</i>						
Products or institutions	0.48 (0.63)	0.81 (0.42)	3.50 (0.00)	4.70 (0.00)	3.17 (0.00)	5.92 (0.00)
<i>Sample means (percent)</i>						
<i>Nonhousehold heads</i>						
Questions on use of products (n = 1,223)	7.4 (0.8)	7.4 (0.8)	1.4 (0.3)	16.3 (1.1)	0.7 (0.2)	15.0 (1.0)
Questions on use of institutions (n = 930)	6.0 (0.8)	6.5 (0.8)	0.4 (0.2)	6.3 (0.8)	1.8 (0.4)	4.4 (0.7)
<i>t-tests of equivalence of means</i>						
Products or institutions	1.29 (0.20)	0.89 (0.37)	2.25 (0.02)	7.10 (0.00)	2.52 (0.01)	8.11 (0.00)

Note: Numbers in parentheses are standard deviations for sample means and p-values for t-statistics.

Source: Authors' analysis of survey data.

Nor does the problem appear to stem from the financial knowledge of the respondent. One would expect the head of household to be the most financially knowledgeable member of the household, but even when the head is asked about personal use of insurance products, the product-based use rate is much higher than the institution-based measure (table 7). A similar pattern holds for *formal credit* and *informal savings*, for both household heads and nonheads, and the differences between the product- and institution-based use rates are statistically significant. The evidence points to across-the-board difficulties for

all respondents in using institution-based questions to gather information on formal credit, informal savings, and insurance.

In summary, the preliminary comparisons across treatment groups indicate that the identity of the respondent and the way questions are asked affect reported use of some financial services. Full enumerations of all household members produce use rates similar to those reported by the head of household, while interviewing a randomly selected nonhead produces lower levels of household use. Product-related cues appear to be important to fully understand the use of insurance, formal credit, and informal savings but do not appear necessary for more basic services such as bank accounts and formal savings.

IV. REGRESSIONS

This section reports on tests of whether the differences across treatments described in the previous section hold up in regressions after controlling for other factors that could affect use. Some regressions are also designed to identify the characteristics of the individuals and households that reported lower levels of use on institution-based questions than on product-based questions. Another set of regressions examines the household characteristics of the randomly selected informants who reported lower household use rates than those obtained from the head of household or the full enumeration. The hope is to identify the types of respondents who have difficulty with certain question formats.

Household Use: Full Enumeration or Informants

To describe household use of financial services, the following specification was estimated in a probit regression model:

$$\begin{aligned} Finance_i = & \alpha + \beta_1 age_i + \beta_2 rural_i + \beta_3 size_i + \beta_4 dependent\ share_i \\ & + \beta_5 female\ head_i + \beta_6 age\ of\ head_i + \beta_7 education\ of\ head_i \\ & + \beta_8 head\ numerate_i + \beta_9 share\ in\ agriculture_i \\ & + \beta_{10} share\ employed_i + \beta_{11} share\ self-employed_i \\ & + \beta_{12} informant\ is\ head_i + \beta_{13} random\ informant_i + \epsilon_i \end{aligned}$$

where *finance* is one of the seven indicators of household use of financial services described in section III (*banked, indirect access, nonbank saving, informal saving, formal credit, informal credit, and insurance*). All those indicators are dummy variables equal to one if any member of household *i* uses that service.

Four variables control for the composition and location of the household. Positive coefficients are expected for the average *age* of household members and household *size* because larger households with older members are more likely to have an individual who uses financial services. For the same reason, households with a high *dependent share* are expected to use fewer financial

services. Use is expected to be lower in *rural* areas because financial services are less available. Variables for gender, age, education, and numeracy control for characteristics of the head of household. The dummy variable indicating whether the head is *female* is expected to be negatively linked to use of financial services if providers exhibit biases against women or perhaps for broader cultural reasons. *Age*, *education*, and *numeracy* are expected to be positively associated with use of financial services. *Education* is controlled for using two dummy variables: one indicating whether the head attended primary school and another indicating whether the head attended upper secondary school.¹⁴

Three variables control for the employment composition of the household: *share in agriculture*, *share employed*, and *share self-employed*. Those who are employed are expected to have greater need for financial services. Agricultural workers and the self-employed might have different needs or find it more difficult to obtain financial services. *Informant is head* and *random informant* are dummy variables that describe the identity of the survey respondent. The informant dummy variables therefore capture the effects on reported household use rates relative to the omitted treatment category, a full enumeration of all adult household members' individual use of financial services. Definitions and summary statistics for the variables used in the analysis are in table 8; the correlations between variables appear in table 9. The correlations indicate that many household characteristics fit together in predictable ways. For example, rural households tend to be larger and more focused on agricultural activities. The summary statistics and correlations are calculated for the 3,630 observations that enter the regressions that summarize individual use. Very similar summary statistics and correlations are found for the 1,734 observations that enter the household use regressions. To conserve space, only the information from the larger sample of individual use is reported here.

The regression results for household use of financial services appear in table 10. In the regression with *banked* as the dependent variable (column 1), many of the control variables are significant and of the expected sign. In particular, household size, age of the head of household, and attendance in upper secondary school (or beyond) are all significantly positively linked to being banked. Rural location, female headship, the share of dependents, and the share of self-employed workers are all negatively linked to being banked. The control variables do a better job of explaining variation in the *banked* indicator than in the other indicators, as reflected in both the overall fit of the regressions and the number of significant variables. There is also a general tendency for the control variables to explain more variation in the use of services from

14. These dummy variables were chosen because they provide a reasonably large number of respondents in the lowest (no formal schooling) and highest (upper secondary school and beyond) categories. Note also that both dummy variables are equal to one for respondents that attended upper secondary school and beyond. To measure the effects of education on financial usage for those respondents, the coefficients on both of the dummy variables must be summed.

TABLE 8. Variable Descriptions and Summary Statistics

Variable	Definition	Mean	Minimum	Maximum
<i>Financial use variables</i>				
Banked	Equals 1 if any member of the household has an account with a bank	0.140	0	1
Formal savings	Equals 1 if household has formal non-bank savings	0.142	0	1
Informal savings	Equals 1 if household has informal savings	0.150	0	1
Formal credit	Equals 1 if household has credit from a formal provider of financial services	0.021	0	1
Informal credit	Equals 1 if household has credit from informal sources	0.013	0	1
Insurance	Equals 1 if household has insurance product from a formal provider	0.120	0	1
<i>Household characteristics</i>				
Age	Average age of household members	36.864	8	98
Rural	Equals 1 if rural	0.679	0	1
Household size	Number of household members	5.453	1	23
Share dependents	Percentage of dependents in household	0.540	0	1
Female household head	Equals 1 if household head is female	0.225	0	1
Age of household head	Age of household head in years	47.436	16	98
Household head attended primary school	Equals 1 if household head has attended primary school	0.604	0	1
Household head attended upper-secondary school	Equals 1 if household head has attended upper secondary school	0.339	0	1
Household head numerate	Equals 1 if household head can do written calculations	0.591	0	1
Share agricultural workers	Percentage of agricultural workers in household	0.398	0	1
Share employed	Percentage of employed members of household	0.081	0	1
Share self-employed	Percentage of self-employed members of household	0.246	0	1
Attended primary school	Equals 1 if household member has attended primary school	0.614	0	1
Attended upper-secondary school	Equals 1 if household member has attended upper-secondary school	0.242	0	1
Numerate	Equals 1 if household member can do written calculations	0.594	0	1

Source: Authors' analysis of survey data.

TABLE 9. Correlations between Variables

Variable	Banked	Formal savings	Informal savings	Formal credit	Informal credit	Insurance	Age	Rural	Household size	Dependent share	Female household head	Age of household head
Banked	1											
Formal savings	0.935***	1										
Informal savings	0.132***	0.140***	1									
Formal credit	0.231***	0.223***	0.134***	1								
Informal credit	0.035**	0.034**	0.191***	0.101***	1							
Insurance	0.255***	0.227***	0.146***	0.143***	0.0228	1						
Age	0.144**	0.144**	0.033*	0.058***	0.0054	0.060***	1					
Rural	-0.191***	-0.186***	-0.132***	-0.016	-0.053***	-0.121***	0.034**	1				
Household size	-0.102**	-0.108***	-0.092***	-0.010	-0.017	-0.034**	-0.166***	0.224***	1			
Dependent share	-0.132***	-0.136***	-0.092***	-0.036**	-0.007	-0.019	0.226***	0.202***	0.314***	1		
Female household head	-0.072**	-0.070***	0.047***	-0.032*	0.011	-0.003	0.071***	-0.151***	-0.250***	0.125***	1	
Age of household head	-0.021	-0.033**	-0.108***	-0.022	-0.016	0.020	0.458***	0.009	0.064***	0.391***	0.104***	1
Household head attended	0.190***	0.195***	0.145***	0.058***	-0.008	0.145***	-0.180***	-0.267***	-0.143***	-0.293***	-0.107***	-0.326***
primary school												
Household head attended	0.274**	0.270**	0.107***	0.084***	0.002	0.186**	-0.057***	-0.308**	-0.097***	-0.216**	-0.122**	-0.038**
upper-secondary school												
Household head	0.217**	0.217**	0.140***	0.050***	0.010	0.129***	-0.147***	-0.296**	-0.150**	-0.245***	-0.089***	-0.256***
numerate												
Share agricultural workers	-0.166**	-0.156**	-0.095***	-0.027	-0.016	-0.177**	0.112**	0.403**	-0.022	-0.038**	-0.180**	0.070**
Share employed	0.245**	0.244**	0.105**	0.087***	-0.007	0.094**	-0.036**	-0.339***	-0.247***	-0.380**	-0.050**	-0.126**
Share self-employed	-0.088**	-0.082**	-0.017	-0.044***	-0.037**	-0.060**	0.143**	0.0903**	-0.345**	-0.123**	0.047**	0.021
Attended primary school	0.186**	0.184**	0.099**	0.048**	-0.010	0.134**	-0.336**	-0.296**	-0.159**	-0.235**	0.031*	-0.156**
Attended	0.357**	0.348**	0.118**	0.108**	0.012	0.201**	0.068**	-0.286**	-0.144**	-0.226**	-0.023	-0.018
upper-secondary school												
Numerate	0.208**	0.207**	0.106**	0.0452**	0.014	0.128**	-0.289***	-0.319***	-0.167**	-0.206**	0.039**	-0.122**
Employed	0.067**	0.074**	0.110**	0.073**	0.033**	-0.050**	0.152**	0.163**	-0.028*	-0.105**	-0.121**	-0.183**

(Continued)

TABLE 9. Continued

	Household head has some primary education	Household head has some upper-secondary education	Household head numerate	Share agricultural workers	Share employed	Share self-employed	Some primary education	Some upper-secondary education	Numerate	Employed
Head has some primary education	1									
Head has some upper-secondary education	0.579***	1								
Household head numerate	0.730***	0.573***	1							
Share agricultural workers	-0.281***	-0.338***	-0.304***	1						
Share employed	0.210***	0.275***	0.204***	-0.212***	1					
Share self-employed	-0.027	-0.110***	-0.034**	0.412***	-0.297***	1				
Attended primary school	0.651***	0.436***	0.533***	-0.303***	0.197***	-0.037**	1			
Attended upper-secondary school	0.394***	0.641***	0.389***	-0.268***	0.274***	-0.080***	0.448***	1		
Numerate	0.511***	0.445***	0.691***	-0.305***	0.198***	-0.049***	0.767***	0.447***	1	
Employed	-0.040**	-0.114***	-0.060***	0.394***	0.060***	0.253***	-0.153***	-0.027	-0.157***	1

* Significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level.

Source: Authors' analysis of survey data.

TABLE 10. Household Financial Services Use Rate Regressions, Marginal Effects

Variable	Expected sign ^a	Banked (1)	Indirect access to account (2)	Formal nonbank savings (3)	Informal savings (4)	Formal credit (5)	Informal credit (6)	Insurance (7)
Average age of household members	+	-0.0015 (0.0011)	0.0005 (0.0005)	0.0002 (0.0003)	0.0001 (0.0009)	0.0005* (0.0003)	-0.0001 (0.0004)	0.0004 (0.0006)
Rural	-	-0.0734*** (0.0223)	0.0229** (0.0116)	-0.0060 (0.0057)	0.0461** (0.0216)	0.0020 (0.0059)	-0.0271*** (0.0102)	0.0187 (0.0153)
Household size	+	0.0040*** (0.0040)	0.0020 (0.0021)	0.0003 (0.0010)	0.0049 (0.0040)	0.0028*** (0.0009)	0.0024 (0.0017)	0.0044 (0.0027)
Share dependents	-	-0.1324*** (0.0459)	-0.0063 (0.0226)	0.0157 (0.0129)	0.0425 (0.0446)	-0.0287** (0.0126)	0.0135 (0.0217)	0.0121 (0.0313)
Female household head	-	-0.1243*** (0.0201)	0.0042 (0.0131)	-0.0052 (0.0060)	0.0566** (0.0256)	-0.0092 (0.0057)	0.0143 (0.0125)	-0.0028 (0.0170)
Age of household head	+	0.0034*** (0.0011)	-0.0002 (0.0005)	-0.0004 (0.0003)	0.0009 (0.0010)	-0.0003 (0.0003)	-0.0003 (0.0004)	0.0012* (0.0007)
Household head attended primary school	+	-0.0520 (0.0346)	0.0218 (0.0174)	-0.0035 (0.0102)	0.0869*** (0.0309)	0.0064 (0.0097)	-0.0070 (0.0141)	0.0011 (0.0247)
Household head attended upper-secondary school	+	0.1767*** (0.0258)	0.0287** (0.0125)	0.0125* (0.0068)	0.0251 (0.0239)	0.0056 (0.0065)	-0.0142 (0.0116)	0.0616*** (0.0176)
Household head numerate	+	0.0948*** (0.0299)	0.0103 (0.0159)	0.0196** (0.0087)	0.0329 (0.0286)	0.0038 (0.0089)	0.0247* (0.0121)	0.0494** (0.0212)
Share agricultural workers	-	-0.0552 (0.0368)	-0.0013 (0.0189)	0.0073 (0.0107)	0.0116 (0.0355)	-0.0068 (0.0084)	0.0178 (0.0168)	-0.1015*** (0.0273)
Share employed	+	0.0420 (0.0508)	0.0482* (0.0251)	0.0125 (0.0127)	0.0406 (0.0527)	0.0157 (0.0129)	-0.0046 (0.0240)	0.0275 (0.0381)
Share self-employed	-	-0.1096*** (0.0301)	0.0301 (0.0146)	0.0146 (0.0146)	0.0380 (0.0380)	0.0051 (0.0051)	-0.0630** (0.0240)	0.0562* (0.0381)

(Continued)

TABLE 10. Continued

Variable	Expected sign ^a	Banked (1)	Indirect access to account (2)	Formal nonbank savings (3)	Informal savings (4)	Formal credit (5)	Informal credit (6)	Insurance (7)
Informant is head of household	?	(0.0474) 0.0233 (0.0235)	(0.0234) 0.0071 (0.0117)	(0.0144) 0.0015 (0.0061)	(0.0452) 0.0197 (0.0229)	(0.0126) 0.0055 (0.0065)	(0.0238) -0.0004 (0.0107)	(0.0334) 0.0257 (0.0175)
Informant is randomly selected nonhead	-	-0.1655***	-0.0149	0.0052	0.0044	-0.0043	-0.0015	0.0259
Number of observations		(0.0190)	(0.0120)	(0.0061)	(0.0250)	(0.0063)	(0.0113)	(0.0197)
Log likelihood		1734	1734	1734	1734	1734	1734	1734
Pseudo R ²		-738.6819	-329.6634	179.6205	788.4633	-165.9691	-287.8245	-516.1416
Chi ² head random		0.1910	0.0607	0.1083	0.0457	0.1103	0.0491	0.0829
p head random		47.05***	2.38	0.89	0.30	1.87	0.01	0.00
		0.0000	0.1231	0.3442	0.5838	0.1712	0.9310	0.9845

*Significant at the 10 percent level; **significant at the 5 percent level; *** significant at the 1 percent level.

a. Expected signs are for access to formal financial services, especially for being banked. For other services, especially those that are informally provided, these hypothesized relationships might not hold as well, or at all.

Note: Numbers in parentheses are standard errors.

Source: Authors' analysis of survey data.

formal providers (*banked*, *formal nonbank saving*, and *formal credit*) than from informal providers (*informal credit* and *informal savings*).

When household characteristics are controlled for in the regressions, the comparisons across the treatment groups remain similar to those in the summary statistics in table 5. There are no significant differences between the head of household as the respondent and a full enumeration, as reflected in the insignificant coefficients for the *informant = head* variable for all indicators. By contrast, the tests of whether coefficients for the two informants (head and random) are equal, reported at the bottom of the table, reveal significant differences for the *banked* indicator. There is no longer a significant difference for *formal credit* or *indirect access*, as there was in the summary comparisons, but that could be because there is so little use of those services in the sample. In countries where formal credit or indirect access is more prevalent, significant differences might emerge.¹⁵

In addition, the coefficient for a randomly selected informant is negative and highly significant for being *banked*, indicating that the random informant provides less complete information on household use of banking services than does a full enumeration. In short, though the significance levels fall when controlling for additional factors that affect use, the same qualitative patterns emerge: the head of household and a full enumeration produce similar household use rates, but a randomly selected (nonhead) informant produces lower use rates for services from formal providers.

To get a better understanding of whether particular household characteristics drive the lower use rates reported by random informants, the control variables are interacted with the treatment variables. That is, the explanatory variables are multiplied by *head = informant* to derive a second set of explanatory variables and multiplied by *random informant* to derive a third set. The two new sets of explanatory variables are included in the original regressions in the full-interaction specifications:

$$Finance_i = \sum_{t=1}^3 (\partial_t + \beta_t X_i) + \varepsilon_i$$

where t refers to the three treatment categories (full enumeration, head of household informant, and random informant) and X is the set of covariates from the original regression. This allows the control variables to affect reported use in different ways across treatment categories.

For the most part, the determinants of *banked*, *indirect access*, and *formal credit* are similar across the three treatments, as indicated by insignificant

15. The significant differences for *formal credit* and *indirect access* found in table 5 might reflect the problem of small numbers (where small deviations seem to imply highly significant differences since so few respondents use these services). In any event, significance disappears after controlling for other relevant factors through regression.

coefficients on the interaction variables. To conserve space, these results are not presented here. There are some exceptions for *banked* that are worth noting, however. For the trials that use a random informant, the share of dependents has a strong negative association with being banked. Note that for the survey, qualifying adults were all household members age 15 or older. Thus, a number of the randomly selected informants were dependents under the definition used to construct the dependent share control variable. The negative significant coefficient for dependent share reflects, at least in part, the difficulties that young adults face in responding to institution-based questions about household use of banking services.¹⁶

Since the determinants of household use of banking services are similar whether use is reported by a random informant or calculated from a full enumeration of individuals' use, and since the constant is not statistically different for those two treatment categories in the full-interaction specification, it appears that younger, poorly informed household members were largely responsible for the relatively low use of banking services reported by random informants and shown in the summary statistics in table 5 and the basic regressions in table 10.

The great majority of coefficients for heads of household are insignificant, indicating that the determinants of use are similar for those treatments and the ones that used full enumeration, but again the exceptions are instructive. The first is that in households where the head is numerate, use of banking services is significantly greater under full enumeration but not when the head reports on household use. This suggests that numerate heads pass on knowledge to other household members about banking services that increases others' personal use, but both numerate and innumerate heads have a reasonable grasp of household use of banking services when they are asked.

A second difference is that the share of employed household members is positive and significant in the full enumeration specifications, presumably because the employed have greater need of banking services, but insignificant when the head reports on household use. Like the insignificant result for numerate heads of household, the one for share of employed household members suggests that household heads know about the use of banking services by the employed members of their household and are able to report on it when asked the institution-based question.

Product or Institutional Questions

For the regressions that describe individual use of financial services and compare product- and institution-based questions, the following individual

16. When a dummy variable is included indicating that the random respondent is 15–18 years old, it is negative and significant while the dependent share variable is no longer significant. This provides additional evidence that it is younger respondents who have difficulty providing accurate information about household use of banking services.

characteristics are added to the household characteristics used in the regressions in the previous section: education level of the respondent (dummy variables for attended primary and attended upper secondary school) and dummy variables indicating whether the respondent is numerate and employed. Education level, numeracy, and employment are expected to be positively linked to personal use of financial services. The informant dummy variables are replaced with a dummy variable indicating whether the respondent was asked product-based questions. The coefficient on that variable therefore measures reported use rates relative to the omitted category, respondents who answered institution-based questions.

The regressions results appear in table 11.¹⁷ The individual characteristics are almost all positive and significant for *banked* and *formal savings* (*banks + nonbanks*). Employed respondents are significantly more likely to use all types of financial services except for insurance, and the marginal effects for the non-insurance indicators are large relative to the average individual use rates reported in table 6. The education level of the respondent is associated with greater use of insurance, however. In all, the individual characteristics explain substantial variation in the financial use indicators.

That said, household characteristics also explain substantial variation in individual use. As in the household use regressions, average age in the household is positively associated with the indicators. Rural location, female headship, and the shares of agricultural workers and self-employed workers are significantly negatively associated with the indicators.¹⁸ The overall fit is also better in the individual use regressions than in the household use regressions, as reflected in the pseudo- R^2 values.

Most important, the dummy variable indicating whether the respondent answered product-based questions is positive and significant for *informal savings*, *formal credit*, and *insurance*, as was true for the summary comparisons in table 6. The marginal effects of the product-based questions variable are also large in those regressions relative to the levels of personal use of those services reported in table 6. Moreover, the coefficient for the product-based question format implies a disparity between treatments similar to that implied by the simple bivariate comparisons. For example, table 6 indicates that

17. For households in group 2, all members were first asked about their own use of financial services using the institution-based questions, and then a member of the household was randomly selected to answer the more detailed product-based questions. In this way, the random respondent provides an observation under both question formats. Although this could have implications for the standard errors, this does not appear to be a cause for major concern: product-institutional comparisons are very similar whether the group 2 product-based responses from the randomly selected household members are included or not. Results are therefore reported for product-based questions for both groups 1 and 2.

18. The age of the head of household is negatively associated with indicators of individual use, whereas it was positively associated with household use. This is because the age of the household head competes with the average age of all household members in the individual use regressions. When one of those variables is dropped, the other is positive and significant in the regressions in table 11.

TABLE 11. Individual Financial Services Use Rate Regressions, Marginal Effects of Product versus Institutional Questions

Variable	Expected sign ^a	Formal saving				Insurance (6)
		Banked (1)	(banks + nonbanks) (2)	Informal savings (3)	Formal credit (4)	
Average age of household members	+	0.0042*** (0.0004)	0.0045*** (0.0004)	0.0019*** (0.0005)	0.0005*** (0.0001)	-0.00001 (0.0001)
Rural	-	-0.0386*** (0.0124)	-0.0385*** (0.0126)	-0.0533*** (0.0148)	0.0018 (0.0023)	-0.0128*** (0.0049)
Household size	?	-0.0021 (0.0020)	-0.0026 (0.0021)	-0.0035 (0.0023)	0.0003 (0.0004)	-0.0012** (0.0005)
Share dependents	-	-0.0371 (0.0226)	-0.0368 (0.0228)	-0.0305 (0.0270)	-0.0030 (0.0051)	-0.0036 (0.0054)
Female household head	-	-0.0543*** (0.0099)	-0.0524*** (0.0102)	0.0391*** (0.0158)	-0.0035 (0.0024)	-0.0021 (0.0025)
Age of household head	+	-0.0018*** (0.0005)	-0.0022*** (0.0005)	-0.0021*** (0.0005)	-0.0003*** (0.0001)	-0.00005 (0.0001)
Household head attended primary school	+	-0.0479** (0.0253)	-0.0270 (0.0243)	0.0482** (0.0215)	0.0039 (0.0043)	-0.0021 (0.0046)
Household head attended upper-secondary school	+	-0.0137 (0.0174)	0.0172 (0.0176)	0.0094 (0.0184)	0.0046 (0.0050)	-0.0004 (0.0039)
Household head numerate	+	0.0343 (0.0222)	0.0200 (0.0231)	0.0120 (0.0229)	-0.0076 (0.0068)	-0.0007 (0.0047)
Share agricultural workers	-	-0.0713*** (0.0129)	-0.0630*** (0.0129)	-0.0606*** (0.0129)	-0.0015 (0.0015)	-0.0026 (0.0015)

Share employed		(0.0196)	(0.0197)	(0.0226)	(0.0041)	(0.0047)	(0.0205)
	+	0.0490*	0.0497*	-0.0335	0.0025	-0.0290***	0.0284
		(0.0259)	(0.0262)	(0.0316)	(0.0053)	(0.0087)	(0.0276)
Share self-employed	-	-0.0754***	-0.0754***	-0.0684**	-0.0147**	-0.0292***	0.0211
		(0.0265)	(0.0266)	(0.0296)	(0.0069)	(0.0074)	(0.0268)
Respondent attended primary school	+	0.0458**	0.0350***	-0.0081	0.0004	-0.0076	0.0151
		(0.0215)	(0.0220)	(0.0233)	(0.0048)	(0.0059)	(0.0203)
Respondent attended upper-secondary school	+	0.1109***	0.1008***	0.0082	0.0048	0.0020	0.0467***
		(0.0230)	(0.0225)	(0.0187)	(0.0053)	(0.0044)	(0.0175)
Respondent numerate	+	0.03700	0.0488**	0.0241	0.0057	0.0046	0.0219
		(0.0223)	(0.0223)	(0.0230)	(0.0051)	(0.0045)	(0.0203)
Respondent employed	+	0.0509***	0.0527***	0.0991***	0.0122***	0.0093***	-0.0046
		(0.0106)	(0.0107)	(0.0114)	(0.0027)	(0.0022)	(0.0126)
Product	+	0.0122	0.0067	0.0913***	0.0100***	-0.0112***	0.1019***
		(0.0095)	(0.0096)	(0.0106)	(0.0028)	(0.0022)	(0.0091)
Number of observations		3630	3630	3630	3630	3630	3630
Log likelihood		-1126.0058	-1145.0915	-1371.3258	-303.0288	-227.5562	-1152.5292
Pseudo R ²		0.2357	0.2294	0.1068	0.1702	0.1235	0.1365

*Significant at the 10 percent level; **significant at the 5 percent level; *** significant at the 1 percent level.

a. Expected signs are for access to formal financial services, especially for being banked. For other services, especially those that are informally provided, these hypothesized relationships might not hold as well, or at all.

Note. Numbers in parentheses are standard errors.

Source: Authors' analysis of survey data.

product-based questions produce an insurance use rate 10.6 percentage points higher than institution-based questions, while the product-based coefficient from the regression indicates a 10.2 percentage point difference between treatments.¹⁹ The regression results therefore reinforce the conclusion that product-based cues help respondents provide a more complete picture of their use of those three financial services. For *banked* and *formal savings (banks + non-banks)*, the product-based questions dummy variable is insignificant, indicating again that product-based cues are less important for those services. For *informal credit*, the product-based dummy variable is negative and significant, but again the way that product-based question was constructed led to a test that is not very meaningful.

To better identify the types of individuals who benefit most from product-related cues, the explanatory variables in table 11 were interacted with the dummy variable for product-based questions for the three services for which a significant increase in use rates was found for product-based questions compared with institution-based questions. Almost all the coefficients on the interaction terms are insignificant, indicating that the determinants of reported use are similar for the two question formats and suggesting that all respondents benefit from product-related cues regarding formal credit, informal savings, and insurance. Therefore, those results are not presented. These findings reinforce the conclusions drawn from the simple sample breakdown in table 7.

Controlling for Supply-Side Effects

To ensure that supply-side effects—the presence of providers of financial services—are not driving the differences in use across treatments that were reported above, additional regressions were run to control for travel time (in minutes) to the nearest bank as a measure of the local availability of financial services and others that include regional or local dummy variables to capture these effects. As in the base regressions, household use is very similar for full enumeration and when the head of household is the informant, and reported use of banking services is significantly lower for the random informant. Individual use rates are significantly higher for product-based questions for informal savings, formal credit, and insurance.²⁰ In short, it seems unlikely that the omission of supply-side variables from the base regressions could be driving the results.

19. The same is true of the household use regressions. For example, the regressions imply that a random respondent is 16.6 percentage points less likely to report that someone in the household is banked than is revealed through a full enumeration. The difference between those two treatments in the bivariate comparison is 15.5 percentage points.

20. The working paper version of this article provides more details about these regressions, including the results (Cull and Scott 2009).

V. CONCLUSIONS AND IMPLICATIONS FOR FUTURE SURVEYS

Measuring the breadth of outreach of financial sectors in developing countries remains a challenge, but one that must be met to better understand how financial services (or their absence) affect the livelihoods of the poor. Surveys of individuals and households about their use of financial services hold the most promise for measuring outreach well, but their cost and other logistical hurdles have made it difficult to develop a standard method of questioning that would generate comparable financial use data across countries and within countries over time. This experimental analysis was designed to contribute to an understanding of the comparability of financial use data generated under different question formats.

The main findings are straightforward, intuitive, and should be useful for future data gathering efforts. Rates of household use of financial services are similar when the head reports on behalf of the household and when the rate is tabulated from a full enumeration of individual use. By contrast, randomly selected informants provide a less complete picture of household use of financial services than do the other two methods. The comparability of data for the head of household and the full enumeration is potentially important because interviewing only the head is much less costly than interviewing all household members. At the same time, some surveys, such as those measuring labor force participation, are designed to be full enumerations. Using the head of household when possible and a full enumeration when dictated for other reasons should increase the number of countries for which comparable data can be generated.

For formal credit, informal savings, and insurance, reported use is higher when questions are asked about specific financial products rather than about the respondents' dealings with types of financial institutions. Product-related cues for these services appear to be important for all respondents, not just those who might be expected to be less knowledgeable about financial matters. The results are therefore similar to those from experiments on measuring household consumption, where inclusion of a longer list of items leads to higher reported consumption than does a shorter list of broader consumption categories.

If treatments that yield higher use rates are presumed to be a more accurate depiction of reality (as seems likely), then using techniques such as random respondents and institution-based questions, though certainly less costly, will capture only a fraction of the use of some financial services (only half for some services in Ghana). This could make it difficult to design appropriate policies to foster financial inclusion and to measure their effectiveness.

Although product-based and institution-based use were tested only for personal use of financial services, it seems likely that product-related cues would also benefit respondents informing about household use of those services. That implies adapting the institution-based questions used in the financial modules

TABLE 12. Time Costs of Administering Financial Services Survey (minutes)

Services and response	Questionnaire type			Total
	1	2	3	
<i>Banked</i>				
No	41.52 (22.26) [n = 468]	32.15 (14.21) [n = 475]	35.92 (15.61) [n = 479]	36.50 (18.08) [n = 1,422]
Yes	52.75 (34.89) [n = 187]	36.09 (15.97) [n = 158]	42.76 (20.50) [n = 178]	44.32 (26.45) [n = 523]
<i>Formal credit</i>				
No	44.12 (26.30) [n = 613]	33.15 (14.79) [n = 621]	37.50 (17.27) [n = 634]	38.23 (20.51) [n = 1,868]
Yes	53.50 (34.20) [n = 42]	32.08 (13.51) [n = 12]	45.22 (17.68) [n = 23]	47.69 (28.41) [n = 77]
<i>Insurance</i>				
No	41.23 (22.46) [n = 495]	32.95 (14.74) [n = 582]	37.02 (17.48) [n = 579]	36.85 (18.57) [n = 1,656]
Yes	55.55 (35.51) [n = 160]	35.18 (14.99) [n = 51]	43.32 (15.09) [n = 78]	48.65 (29.37) [n = 289]
<i>Total</i>	44.73 (26.94) [n = 655]	33.13 (14.76) [n = 633]	37.77 (17.32) [n = 657]	38.60 (20.95) [n = 1,945]

Notes: Numbers in parentheses are standard errors.

Source: Authors' analysis of survey data.

of larger, multipurpose surveys to include product-based cues that are appropriate to the country context.

Decisions on future questionnaires will also need to consider the relative costs (in interview time) of implementing the different treatments, which conform to expectations.²¹ The full enumeration using the product list takes the longest to administer. But full enumeration itself, using either the product-based or institution-based questionnaire, adds considerable time to the interviews compared with use of a proxy respondent for the household (see results for group 1 in table 12). In other words, the finding that the head of household is able to provide similar data to that obtained from full enumeration for most products has positive implications for the feasibility of expanding data

21. The time data collected in this survey are, at best, rough approximations of the actual time required. No effort was made to record time at the level of the specific product or institution modules. Only a total for the entire household interview, which includes a roster and further questions on attitudes and knowledge of finance, is available. Also, as groups 2 and 3 contain two different treatments, it is not possible to separate the time costs associated with each one.

collection on financial service use to other countries. Finally, for survey designers in countries that may have higher levels of financial service use, it is important to note how much average interview time rises when household use of financial services is higher. For example, the full enumeration product-based format in questionnaire 1 took 20–30 percent more time to administer when members of the household used banking or insurance services than when they did not (see table 12).

Discernible throughout this article is a concern about the ability to generalize beyond Ghana. While there is a strong undercurrent of common sense to the main findings, which are thus likely to be relevant in other countries as well, the article is specifically about Ghana. And while Ghana might be an adequate reflection of low-income countries in much of Sub-Saharan Africa, it is unlikely to be reflective of the whole developing world. The best that can be done in the context of this article is simply to acknowledge this limitation. In future, however, this type of experiment can be repeated in other countries. A similar study in Timor Leste, where very few respondents use any financial services, found that the differences across treatments were not significant, suggesting that the concerns raised in this analysis are of second order importance in the most financially underdeveloped countries.

We live in a world of rough approximation when it comes to measuring the outreach of the financial systems of developing countries. The reliability of estimates from accounts-based approaches and approaches that meld accounts-based and survey-based information through regressions is difficult to assess. The hope is that the results here provide some practical guidance on how to generate comparable financial use data across countries through surveys, which appear to represent the best vehicle for generating accurate data.

APPENDIX. CONSTRUCTION OF INDICATORS FROM PRODUCT-LEVEL QUESTIONS

Banked:

- Q2 ATM card
- Q4 Debit card
- Q6 Savings Plus account
- Q8 Current account
- Q10 Savings account at bank
- Q12 PostBank account, post office savings account
- Q36 Bank loan
- Q54 Bank overdraft facility

Indirect:

- Q16 Use of someone else's account

Formal savings:

- Q6 Savings Plus account
- Q10 Savings account at bank
- Q12 PostBank account, post office savings account
- Q14 CDs, treasury bills, notes, money market funds
- Q22 Savings with regulated microfinance institution
- Q24 Savings with credit union
- Q30 Shares, investment funds
- Q32 Provident fund
- Q34 Pensions fund

Informal savings:

- Q26 Susu scheme
- Q28 Welfare scheme, other savings club (e.g., with religious organization).

Formal credit:

- Q36 Bank loan
- Q38 Loan from government
- Q40 Loan from credit union
- Q42 Loan from microfinance institution
- Q44 Loan from employer

Informal credit:

- Q48 Welfare scheme, Susu, savings club

Insurance:

- Q60 Vehicle
- Q62 Property
- Q64 Homeowners
- Q66 Debts
- Q68 Travel
- Q70 Life
- Q72 Debts if you die
- Q74 Disability from employer
- Q76 Other disability
- Q78 Professional
- Q80 Funeral policy with institution
- Q84 Health/medical
- Q86 Children's education

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