Measuring Income from Family Enterprises with Household Surveys*

Wim P. M. Vijverberg

ABSTRACT. The accuracy of the measured income of family enterprises is a matter of importance in studies of, *inter alia*, human capital, income distribution, and consumption behavior. Enterprise surveys can measure this income through detailed questions. Household surveys offer a better perspective for a study of living standards and poverty: they capture more of the truly small-scale one-person enterprises; there is a wealth of relevant information about the household; and household surveys allow one to integrate family enterprises into household decisions about labor supply, risk sharing, enterprise start-up, and asset formation.

This paper examines three enterprise income values that one may derive from household surveys held in the Côte d'Ivoire and Ghana. The three values vary much and do not correlate all that well. This sobering conclusion implies that relying on self-reported values of sales revenue, expenditures and enterprise earnings is risky. Greater effort should be made to measure the transactions of enterprises carefully. Using worksheets and cross-checking responses *in loco* should help, but since many enterprises do not use any accounting system, it may be necessary to monitor inflows and outflows either personally or with diaries.

I. Introduction

What determines the income from small-scale non-farm enterprises is still somewhat of a mystery. While there are countless studies of earnings of wage employees and farm productivity, the non-farm self-employed have only recently received more attention of researchers. In a sense, this is not surprising, since it has become apparent that small-scale enterprises create many of the new jobs in an economy, both in industrial and in developing countries.[1] Yet, given how many Third World labor force participants are self-employed, this attention is long overdue: this segment of the population may be important for macro-economic policy-making.[2]

Accurate measurement of enterprise income is important. Would a researcher have access to accurate measures? There are several reasons why an entrepreneur would give erroneous answers to a survey on enterprise income. First of all, he may lack bookkeeping skills and maintain poor records.[3] Even if an accountant is hired to put an income statement together for taxation purposes, the entrepreneur's interpretation as reflected in the survey response could be in error. In developing countries, lack of skills may be acute: many self-employed are illiterate. Wilcock and Chuta (1982) report that many enterprises in Upper Volta (Burkino Faso) lack any formal records. Second, many small-scale entrepreneurs use their records only to produce profit and loss statements, rather than for budgeting and investment information (Holmes and Nicholls, 1988). Together with the time constraint under which any business owner works, one might doubt whether his survey responses are generated with sufficient care. Third, because of barter and other forms of involvement in the underground economy, income could well be understated (e.g., Haber, Lamas and Lichtenstein, 1987; Portes, Castells and Benton, 1989). Enterpreneurs would hesitate revealing their true income, even if it is "only" for a survey and not for the government tax agency. In fact, if all enterprise income is duly reported to the tax authorities, an enterpreneur might still underreport his income to the interviewer because it is sensitive information.

In many studies of small-scale family enterprises, the source of data is an enterprise survey.[4] A few recent studies employ data from household

Final version accepted on 31 January 1992

School of Social Sciences
University of Texas at Dallas
P.O. Box 830688
Richardson, TX 75083-0688

Small Business Economics **4**: 287—305, 1992.

surveys.[5] There are important differences between these types of surveys, which we shall discuss in Section 2. The purpose of this paper is to assess the accuracy of the relevant enterprise variables in household surveys, in particular the Living Standards Survey. The primary focus will be on the income variables and the survey modules that one uses to calculate enterprise income.[6] As should be evident from the discussion above, inferences about the quality of information should apply to surveys in industrial and developing countries alike.

The Living Standards Survey (LSS) is a broad household survey conducted by the World Bank in cooperation with local governments in a number of Third World countries. These surveys aim to measure socioeconomic factors relevant to the living standards of the population. Both in scope and in data collection technology, the LSS is reflective of, or better than, other household surveys. So far, only the surveys in Côte d'Ivoire in 1985 (CILSS) and in Peru in 1985–86 have been extensively analyzed, with a focus on finding determinants of enterprise income. In response to lessons learned from these early applications of the LSS, the enterprise module was rearranged so that it now allows three different measures of enterprise income. This paper examines both the 1986 CILSS data and the data of the combined 1988 and 1989 Ghana Living Standards Survey GLSS).

The plan of the paper is as follows. Section 2 broadly compares household and enterprise surveys. Section 3 describes the LSS enterprise modules. Section 4 compares the three income measures and will pose the question why these are different. Section 5 takes a comparative look at various related measures of enterprise size. Section 6 evaluates the combined evidence and makes general recommendations for household surveys, based on the experience with the Ivorian and Ghanaian LSS data.

II. Advantages of household and enterprise surveys

Household surveys have advantages over enterprise surveys in studying the income of the self-employed. Beside the apparent benefit of capturing the truly small-scale one-person enterprises, there is a wealth of information that can be utilized in the study of enterprise income, such as education of other family members, migration history, and possibly employment history. Complementarity relationships can also be researched: does the family enterprise provide flexible-hours jobs to family members who would benefit from such arrangements (e.g., young mothers); does the family enterprise form a risk-sharing role within the household? Another issue of interest relates the asset position of the enterprise to the household and vice versa. Thus, household surveys offer a better perspective for a study of living standards and poverty. At the same time, household surveys allow a study of the enterprise start-up process, especially when the surveys are longitudinal. With a longitudinal household survey one observes the enterprise sprouting, whereas an enterprise survey can only observe the enterprise as an existing plant.

By comparison, enterprise surveys are able to extract more detailed information about the enterprises than household surveys can. Interviewers of households spend considerable time in gathering information that, for studying enterprises, has no value. Enterprise surveys fully focus on production. Measures of inputs and outputs are the primary objective of the survey, and considerable effort goes into obtaining good measures of these. Sometimes, further information is collected. An example is the survey used by Little, Mazumdar and Page (1987). Aside from the aforementioned variables, questions are asked about the entrepreneur's economic environment, such as start-up problems, financial opportunities in credit, output market information, and type of employees and turnover among them. The only personal information is the enterpreneur's job history. No questions were asked in relation to the household.[7]

A second comparison concerns sampling. Obviously, an enterprise survey draws a random sample from the population of enterprises. A household survey draws from the population of households. Are enterprises observed in a household survey a random sample of the population of enterprises? Suppose that each household contains at most only one enterprise. The sampling process of households would yield many households without an enterprise and some with an

enterprise. Since the latter group is random, the sample of enterprises observed through a household survey is random as well.[8] The case where households contain more than one enterprise seems more complicated, but every enterprise still has an equal probability of being observed, as long as a selected household reports on all enterprises: the probability equals the likelihood that the household is selected. The sampling process does yield a few differences, however. There is a higher probability of selecting enterprises that are partnerships with the partners residing in different households. Also, public enterprises and corporations are unlikely to be observed, as the ownership does not belong to any household in particular. Thus, if a purely random sample of enterprises is desired, an enterprise survey has an advantage — unless the sampling design introduces biases.

The Ivorian LSS data allow an interesting comparison of the sampling outcome with an observed population of enterprises. The government of Côte d'Ivoire[9] held a census of enterprises in 1984. Only "modern sector" firms were included in the sample. The modern sector was defined as comprising

> . . . those establishments in industry, commerce, and services that realized a minimum value of production, or followed an accounting system called "Le Plan Compatable Ivorien," or, in the case of the agricultural sector, met certain production levels.[10]

The census contained 3112 firms employing 206 692 workers. The 1985 CILSS data shows a national labor force participation rate equal to 51 percent of the population over 6 years of age. Also, about 23.4 percent of the population is 0 to 6 years of age, and the mean household size is 8.4. Therefore, the 206 692 workers derive from a population of 529 084 people of all ages, living in 62 986 households. Actually, the population of Côte d'Ivoire in 1984 equalled 9.84 million (IMF, 1989): the modern sector must be employing only a small portion of the population, as we shall now see from evidence from the 1985 CILSS data.

The size distribution of the 3112 enterprises is found in column 2 of Table I. Assuming that each household has only one enterprise head, column 3 gives the size distribution by household: 95.1 percent of the households would not own an enterprise, and this percentage is even higher if some households operate more than one enterprise. Column 4 shows the number of enterprises, by size, one would expect to observe in a sample of 1600 households, which is the size of the CILSS sample. Then, column 5 represents the actually observed size distribution of the enterprises in the CILSS sample where both paid and unpaid workers are counted, and column 6 shows the same when only paid workers are counted. Small family enterprises are undercounted in a census, but there is a fair correspondence between the expected and the observed number of enterprises in the more formal sector (column 6).[11] At the high end of the scale, the CILSS survey fails to observe any enterprises, which, as argued above, is not surprising in a household survey.

The contrast between columns 5 and 6 of Table II may be symptomatic of the sample differences between household and enterprise surveys. Many family enterprises operate from the home, may be loosely organized, and are likely not even officially registered — one of the alleged characteristics of the informal sector (Hart, 1973, and ILO, 1972). Therefore, an enterprise survey may well be biased toward measuring larger enterprises. In fact, the studies by Page (1979), Ho (1980), Cortes, Ishaq and Berry (1987), and Little, Mazumdar and Page (1987) show a drastically different size distribution of firms than studies by Vijverberg (1988) and Moock, Musgrove and Stelcner (1990).

In summary, the choice between a household and an enterprise survey boils down to a choice (i) between scope and depth, and (ii) of the target population. The enterprise module of a household survey is necessarily shorter than an enterprise survey: otherwise the total survey becomes excessive and response quality suffers. Can one still obtain high-quality information about the enterprise while reducing the enterprise module of the household survey to accommodate the rest of the survey? This question is central to this paper.

III. The Living Standards Survey

In the LSS, households are sampled in a two-stage random sampling process. First, communities are randomly selected, and then households within each selected community are sampled. Illustrative of the scope of household surveys, the LSS ques-

TABLE I
Size distribution of enterprises in Côte d'Ivoire, 1984—85

Number of workers	Number of enterprise in census	Percent of households in census with ent.	No. of househ. expected in 1985 CILSS	Observed in 1985 CILSS	
				With paid or unpaid workers	With paid workers only
1—9	1972	3.131	50.10	707	52
10—19	370	0.587	9.39	11	1
20—29	135	0.214	3.42	3	3
30—49	178	0.282	4.51	0	0
50—99	163	0.259	4.14	1	1
100—199	128	0.203	3.25	1	1
200—299	45	0.071	1.14	0	0
300—499	45	0.071	1.14	0	0
500—999	39	0.062	0.99	0	0
1000+	37	0.059	0.94	0	0
Total	3112	4.941	79.06	723	58

TABLE II
Descriptive statistics of enterprise income measures

Variable	Mean	St. dev	Percentiles					IQR[a]
			10%	25%	50%	75%	90%	
A: *Food commerce* (N = 272, CILSS)								
Profits	−10808	131306	−84550	−21900	1776	18263	52331	40162
Net rev.	51358	277768	3397	9496	19491	42087	83381	32590
Earnings	103885	328333	8690	21998	44539	89932	200000	67934
B. *Non-food commerce* (N = 186, CILSS)								
Profits	13861	2196734	−125120	−16181	6264	54916	141632	71096
Net rev.	71505	123670	3595	8632	30637	79727	165928	71095
Earnings	252573	1420164	6083	15208	50000	167292	339187	152083
C: *Commerce* (N = 1471, GLSS)								
Profits	−31991	396095	−71847	−24623	−4337	2623	14209	27246
Net rev.	11731	21688	1157	2877	6733	13607	25831	10729
Earnings	15978	61297	665	2072	5861	15216	35527	13144
D: *Food manufacturing* (N = 534, GLSS)								
Profits	−11410	58857	−39510	−11109	−1448	4868	16451	15977
Net rev.	8995	10094	1455	2868	5651	11738	20308	8870
Earnings	12194	19198	1566	2773	6235	13156	28457	10384

Note: [a] Interquartile range.

tionnaire is partitioned in 17 modules and covers the following topics:[12]

- Household composition and basic demographic variables;
- Housing;
- Schooling;
- Health;
- Economic activities;
- Migration;
- Agriculture;
- Non-farm self-employment;
- Food and non-food expenditures, and consumption of home products;
- Fertility history;
- Other income, savings and credit;
- Anthropometrics.

The module on economic activities covers time allocation both during the week before the interview and during the past year. Hours of work on wage jobs away from the home as well as work on the farm and in family enterprises are enumerated here. The agriculture and non-farm self-employment modules focus more on production-related variables of such activities, such as inputs and outputs.[13] In rural areas, the household questionnaire is supplemented by a community questionnaire measuring local amenities and opportunities, and a price questionnaire measuring price of both consumption and outputs.

The relevant questions in the enterprise module and in the module on economic activities are reproduced in Exhibit 1 below. For each (up to 3) of the family enterprises, the questionnaire deals with (A) general firm characteristics, (B) expenditures on a variety of input categories, (C) revenues, and (D) business assets.

From this questionnaire, three measures of enterprise income can be calculated:

Profits, defined as total revenue minus total expenditures. Total revenue is calculated from questions C1, C2 and C3 if the enterprise was in operation at the time of the interview, or from question C4 if it was not in operation. Note that since the number of days between the two rounds of the interview differ slightly, one must adjust the answer accordingly to obtain monthly or annual revenue values. Total expenditures are obtained by summing the items of part B, in principle accounting for input sharing (see discussion in Section 6).

Net Revenue, defined as the sum of values under question C5 and C6, in addition to the home consumption measure C3 if the enterprise was in operation at the time of the interview.

Earnings, defined as the income reported in the economic activities module, question 3, summed over all household members associated with that family enterprise.

In a sense, the last measure in particular is somewhat redundant. The economic activities module deals in much greater detail with conditions of wage jobs, which applies only to a smaller part of the population, and it describes home activities and employment history, which are generally applicable. However, the earnings measure does assist to examine the reliability of the enterprise module. We shall now turn to a discussion of the calculated income measures.

IV. Analysis of measures of income from family enterprises

4.1. *Comparison*

This paper examines the data collected by the Côte d'Ivoire LSS in 1986 (CILSS) and the Ghana LSS in 1988 (GLSS88) AND 1989 (GLSS89). The CILSS sample contains 1600 households, of which 543 reported on one or more family businesses. The GLSS88 sample contains 3136 households, with 1701 reporting on family enterprises. In principle, the GLSS89 sample is of similar size, but this paper uses only a random subsample of this, for which test scores on reading, mathematics and abstract thinking were collected. This subsample contains 1633 households, with 956 reporting on family businesses. The two Ghanaian samples are pooled in order to reduce the expositional burden; detailed examination reveals few substantial differences.[14] As Ghana experienced substantial inflation in 1988 and 1989,[15] income measures are calculated in prices of January 1989. Incomes are measured in the local currency. In 1986, the exchange rate of the Ivorian currency was CFA 395 = US$1 (see IMF, 1988), while in January, 1989, the Ghanaian cedi was exchanged at ₵ 230 = US$1.

Enterprises within each household are aggregated within a detailed industry code. The (aggregate) enterprises are grouped into broad industries,

Exhibit 1: Survey Modules on the Enterprise and on Economic Activities

Enterprise Module, Part B

During the past 12 months did your business (trade, industry, profession, etc.) make any expenditures for the following?	How much do you usually pay for . . . for this business? (including the value of payments in kind)	How often do you pay for . . . ? Times/Time Unit	Do your household or other businesses belonging to the household use this . . .?
"yes/no" for each item: . . . (A list of 12 items is provided) . . .	"amount"	"number of times" per "day/week/ month/quarter/ half year/ year"	"yes/no"

Enterprise Module, Part C

If the business had been in operation since the interviewer's last visit:

1. Since my last visit, how much money has the business received from the sale of its products, goods or services? . . . . . "amount"

2. Since my last visit, has this business also received payments in the form of goods or services? . . . . . "yes/no"
   If yes: What was the value of these payments since my last visit. . . . . "amount"

3. Since my last visit, has any of this business' products or services been consumed or used by your household instead of being sold? . . . . . "yes/no"
   If yes: What was the value of the products consumed or used since my last visit . . . . . "amount"

If the business had not been in operation since the interviewer's last visit:

4. How much did your business make from the sale of goods and services during the last 4 weeks it was in operation, including the value of payments in kind? . . . . . "amount"

Whether or not the business had been in operation:

5. Do you use part of the money you get from this business for yourself or for your household? . . . . . "yes/no"
   If yes: How much money from the business do you normally use for yourself or your household? . . . . . "amount" per "day/week/month/quarter/half year/year"

6. After making purchases for the business and after using some money for yourself or your household, is there usually any money left? . . . . . "yes/no"
   If yes: How much money do you usually have left after purchases for the business and after using some of the money for yourself or your household? . . . . . "amount" per "hour/day/week/month/quarter/half year/year"

Economic Activities Module

1. For how many days during the past 7 days did you do this work? . . . . . "number"

2. During these days, how many hours per day did you do this work? . . . . . "number"

3. Have you received or will you receive money for this work? . . . . . "yes/no"
   If yes: How much money? . . . . . "amount" per "hour/day/week/month/quarter/half year/year"

separately analyzed in an attempt to reduce the heterogeneity between enterprises.[16] Industry groupings are given in the Appendix. Within each survey, the two largest industry groups are represented in the tables below; important differences in other industry groups are separately mentioned. All enterprises with missing information on any of the three income variables are omitted, as well as those which reported zero total revenue from sales (on the assumption that such information is in error).[17]

As a first impression of the data, Table II presents a variety of descriptive statistics of the profit, net revenue and earnings variables as defined in Section 3. Recall that, by construction, profits can be negative, whereas net revenue and earnings are always reported positive. Immediately noticeable is the difference in mean value of the three enterprise income measures. In three of the four industries represented in Table II, average profits are even negative, and in the two Ghanaian industries more than half of the enterprises show negative profits. Average earnings are twice average net revenue in the CILSS sample, but correspond fairly closely in the GLSS data. In the industries not shown here, similar patterns are found, although smaller proportions of those Ghanaian enterprises report negative profits. Recall that under ideal measurement conditions the values should be identical.[18]

Another feature of Table II is the large standard deviation: there appears to be a large amount of variation in income between enterprises. As it is well-known that means and standard deviations are strongly affected by outliers, Table II also presents various percentiles. They allow us to draw the following conclusion: (1) the distribution of the profits variable is generally lowest, followed by the distribution of net revenue; earnings are generally higher, particular in the CILSS sample; (2) the distribution of each measure, but especially profits and earnings, have long tails with some far-out values.

Let us turn from the distribution of income measures across enterprises to the quality of each measure within the enterprise. Two extreme situations may occur when we rank enterprises by their three values of income: all enterprises are in the exact same order, or they appear in random (or even reversed) order. We must therefore compare values of the three income measures with each other directly.

As a first step, we calculate correlation coefficients (Table III). Two types of correlation measures are presented. Part A refers to the common Pearson correlation coefficients. The highest correlation generally exists between net revenue and earnings. The correlation coefficient of 0.907 in the first column of course catches the eye. However, as is wellknown, correlation coefficients are also strongly affected by outliers. The value of 0.907 is a classic example. One enterprise reports a net revenue that is 7 times larger than the next highest and an earnings value that is 2.67 times as large as the next largest value. Without this enterprise, the first column of Table III reads: −0.022, 0.182, and 0.448, and the positive pattern is suddenly less clear.

Rank correlation statistics are not as sensitive to outliers. To calculate a rank correlation, the sample of each industry is ranked by the two variables to be correlated. Then the sample is divided into ten groups on the basis of one variable (X) and the within-group average rank scores of the other variable (Y) are calculated. A χ^2 test score measures whether the group averages differ from the median score; if they differ, group-average ranks of Y may rise, fall or show other patterns relative to the ranking of X. In part B of Table III, the first two lines show a significant rank correlation statistic when the sample is divided by the profits value. In this case, the values of net revenue and earnings appear to first decrease and then increase with the profit grouping. Lines 3 and 5 point out that, with the sample divided into groups on basis of net revenue and earnings, profit values are randomly distributed across the groups. If profits were measured better, we would have seen significant χ^2 statistics with positive patterns everywhere on lines 1, 2, 3 and 5 of Table III, part B. An illustration of the patterns found through rank correlation is found in Figure 1, depicting the Ivorian food commerce sector. A line labeled Y_x indicates the pattern of group-average ranks of Y when groups are determined by X. The E_P- and N_P-lines, with open and closed circles respectively, are U-shaped. Lines P_E and P_N with open triangles and squares, which rank profits by earnings and or net revenue, slope upward only slightly. Lines E_N

TABLE III
Correlations between the enterprise income measures

Measured correlation	CILSS		GLSS	
	Food commerce	Non-food commerce	Commerce	Food manufacturing
	A: *Pearson Correlation*			
Profit and net rev.	0.387	0.143	−0.294	0.058
Profit and earnings	0.431	0.268	−0.008	−0.016
Net rev. and earnings	0.907	0.177	0.197	0.349
	B: *Rank correlation: Kruskal-Wallis χ^2 approximation test statistics*[a]			
Variable / Ranking by				
Net rev. / Profit	81.9 U	58.5 U	394.9 U	116.3 U
Earning / Profit	95.3 U	73.0 U	183.5 U	68.8 U
Profit / Net rev.	13.8	14.5	41.5 \	18.9 U
Earning / Net rev.	110.0 /	77.5 /	267.1 /	87.7 /
Profit / Earnings	12.1	20.5 /	27.7 \	4.7
Net rev. / Earnings	101.8 /	80.2 /	288.9 /	96.7 /

Note: [a] Critical values of the χ^2 statistic are 14.68 (10 percent significance level), 16.92 (5 percent) and 21.67 (1 percent). The apparent pattern of the average rank score over the ten groups according to the variable by which the sample is ranked is also indicated: down (\), U-shaped (U), or up (/). Insignificant rank correlations are of course associated with no apparent pattern.

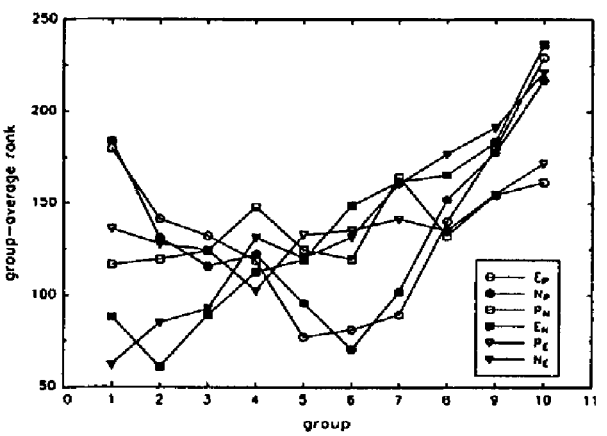

Fig. 1. Rank correlation in Ivorian commerce.

and N_E both slope steeply upward, indicating that rankings of E and N are consistent with each other.

A further method of comparing enterprise income measures directly is to rank the three measures among each other within each enterprise. In one enterprise, we could find profits < net revenue < earnings; in another, we might observe profits < earnings < net revenue. By studying such within-enterprise rankings, we may shed light on whether one particular method of measurement leads consistently to different answers than another. Table IV shows this within-enterprise ranking of the income measures. Since profits can be negative and then are always the lowest of the three variables, this category is separated in the table. Apparently, net revenue does indeed take the median position among the three enterprise measures (as the global descriptive statistics of Table II suggested), but it does not do so consistently. In every industry, around 50 percent of the enterprises report a net revenue value that falls outside the profit and earnings measures. It also appears that profits are fairly systematically lower and earnings higher. The manufacturing sector deviates the most from this "rule."

Variations in rankings are not disturbing when the magnitudes are relatively close together. Table V compares the magnitudes. The bounds chosen

TABLE IV
Relative within-enterprise rankings of enterprise income measures (percent)

	Food commerce (CILSS)			Non-food commerce (CILSS)		
	Profit	Net rev.	Earnings	Profit	Net rev.	Earnings
Negative	46.3	.	.	38.7	.	.
Zero	0.0	1.1	0.7	0.0	2.1	0.0
Pos., lowest	29.0	20.2	2.9	28.8	21.2	9.7
median	21.3	59.6	18.7	22.3	52.4	24.7
highest	3.3	19.1	77.6	10.2	24.2	65.6
Total	100.0	100.0	100.0	100.0	100.0	100.0
	Commerce (GLSS)			Food manufacturing (GLSS)		
	Profit	Net rev.	Earnings	Profit	Net rev.	Earnings
Negative	63.5	.	.	56.0	.	.
Zero	0.0	1.3	5.3	0.0	0.2	1.1
Pos., lowest	12.7	9.6	11.2	16.7	13.9	12.9
median	11.0	45.2	40.4	12.6	48.9	37.8
highest	12.8	43.9	43.2	14.8	37.5	48.1
Total	100.0	100.0	100.0	100.0	100.0	100.0

to generate the tabulation are the 50 and 200 percent marks. Thus, for example, if profits (P) were close to net revenue (N), we would find many observations in the group with $N < 1.5P$ and $P < 1.5N$ (or equivalently, $0.667P < N < 1.5P$). Extreme deviations would fall beyond the 200 percent boundary where either $P > 3N$ or $N > 3P$. In reality, however, profits are reportedly negative for a good number of enterprises, especially in commerce, and only in a few sectors do more than half of the enterprises report profits and net revenue within *200* percent of each other (i.e., $0.33P < N < 3P$). The comparison between profits and earnings are even poorer, as one might have expected on basis of results presented earlier. The comparison between earnings and net revenue is more satisfactory, but only if one is satisfied with the 200 percent bounds.

It becomes clear that the income measures may be fairly imprecise. If one is forced to choose a single measure to represent enterprise income, one would probably choose net revenue.

4.2. *Reasons for differences*

This still begs the question what causes the difference between the income measures. The first hypothesis is that respondents were unclear about the questions they were asked. In relation to earnings, they were asked "Have you received or will you receive money for this work?" and if so, "How much money?" and "How often?" (see Exhibit 1). It is not explicitly stated that the object of the question is net returns from self-employment, i.e., what we call earnings in this paper. Could it be that respondents answered with gross (total) revenue? Table VI compares these two variables: one should be uncomfortable with the large percentage of respondents who report two numbers within 20 percent of each other. There appears to be a systematic difference between the Ivorian and the Ghanaian samples: the GLSS results shows lower earnings/total revenue ratios. Still, it is hard to understand why 30 percent of the sample would report earnings that are more than 20 percent higher than the value of sales. It is possible that for some enterprises earnings are

TABLE V
Relative magnitudes of enterprise income measures (percent)

Relative magnitude	CILSS		GLSS	
	Food commerce	Non-food commerce	Commerce	Food manufacturing
P = Profits, N = Net revenue:				
$P < 0 < N$	46.0	38.2	62.7	56.0
$P > 0$, and: $N > 3P$	10.7	7.5	7.2	8.1
$1.5P < N < 3P$	12.1	11.8	6.3	7.5
$N < 1.5P, P < 1.5N$	18.8	21.5	10.9	14.4
$1.5N < P < 3N$	7.7	11.8	5.0	8.1
$P > 3N$	3.7	7.0	6.6	5.8
$P = 0$ or $N = 0$	1.1	2.2	1.3	0.2
	100.0	100.0	100.0	100.0
P = Profits, E = Earnings:				
$P < 0 < E$	46.3	38.7	60.8	55.2
$P > 0$, and: $E > 3P$	23.9	17.8	9.6	11.4
$1.5P < E < 3P$	17.3	14.5	5.2	6.9
$E < 1.5P, P < 1.5E$	9.2	17.2	7.1	11.8
$1.5E < P < 3E$	1.8	4.3	4.5	6.4
$P > 3E$	0.7	7.5	7.6	7.2
$P = 0$ or $N = 0$	0.7	0.0	5.3	1.1
	100.0	100.0	100.0	100.0
N = Net revenue, E = Earnings:				
$N > 3E$	3.3	7.5	16.5	12.6
$1.5E < N < 3E$	6.3	7.5	18.1	15.9
$N < 1.5E, E < 1.5N$	23.9	33.9	24.1	31.5
$1.5N < E < 3N$	30.2	22.6	16.6	17.8
$E > 3N$	34.6	26.3	18.4	21.0
$N = 0$ or $E = 0$	1.8	2.1	6.4	1.4
	100.0	100.0	100.0	100.0

actually a measure of total revenue rather than net returns, or, alternatively, that for some enterprises "total revenue" measures the net returns.[19]

Therefore, a second hypothesis, one that may shed light on the alternative explanations for the patterns shown in Table VI, is that some of the respondents did not reveal their total revenue accurately. Some evidence of this is presented in Table VII, where net revenue is compared to total revenue. Recall from section 3 that the interviewer first asks about total revenue and then about the amount of money that is left over for use in the household. Of course, total revenue should be larger than net revenue. Table VII shows that this is more consistently the case than in the comparison with earnings, but that still around 40 percent of the sample reports net revenue that are close to or exceed total revenue. Detailed inspection of individual responses showed cases where the sales revenue "since the last visit" was less than the amount "normally used for yourself or your household" or the amount that is "usually left over after purchases for the business."

A third hypothesis is that measurement of total expenditures is faulty. Table VIII shows the percentage of enterprises that reported no expen-

TABLE VI
Comparing earnings to total revenue of the enterprises (percent)

Earning/total revenue ratio	CILSS		GLSS	
	Food commerce	Non-food commerce	Commerce	Food manufacturing
0.0—0.4	10.3	16.1	44.8	37.6
0.4—0.8	17.3	16.1	17.5	21.2
0.8—1.2	34.2	36.5	12.6	12.6
1.2—2.0	17.6	18.3	8.7	15.4
2.0—5.0	14.3	7.5	10.7	10.1
> 5.0	6.3	5.4	5.7	3.2
	100.0	100.0	100.0	100.0

TABLE VII
Comparing net revenue to total revenue of the enterprise (percent)

Net revenue/total revenue ratio	CILSS		GLSS	
	Food commerce	Non-food commerce	Commerce	Food manufacturing
0.0—0.4	32.4	37.1	42.2	42.7
0.4—0.8	35.6	25.8	24.1	24.9
0.8—1.2	23.5	24.7	12.4	14.0
1.2—2.0	5.1	5.9	10.3	11.8
2.0—5.0	2.6	2.7	9.0	5.6
> 5.0	0.7	3.8	2.0	0.9
	100.0	100.0	100.0	100.0

TABLE VIII
Measurement problems with total expenditures

	CILSS		GLSS	
	Food commerce	Non-food commerce	Commerce	Food manufacturing
No expenditures reported %	0.0	2.2	1.8	1.5
One input item exceeding reported total revenue %	40.8	31.7	58.2	48.1
Value of inputs reportedly shared[a]	81738	180970	48143	19769
(% of total expenditures)	(63.2)	(46.6)	(66.6)	(54.2)
Value of inputs identified as being shared[a]	1408	750	64	44

Note: [a] Mean value per enterprise.

ditures during the last 12 months, and the percentage where the maximum single expenditure item exceeded total revenue. Non-reporting of expenditures, which would lead to an overestimate of profits, are observed more often in manufacturing and services. On the other hand, cases where expenditures on a single input exceed total revenue occur mainly in commerce and in food manufacturing, and then often refer to items for resale and raw materials.

In still another way, measurement error may have entered in the calculation of total expenditures. The survey asks whether expenditures on a certain category were shared with the household or another family enterprise belonging to the household, but the proportion shared is not asked (see Exhibit 1). The only way to utilize this information is to compare the information given for a particular enterprise with that of other enterprises in the same household.[20] This survey question is hardly effective. Table VIII shows the average amount reportedly shared, which is generally between 30 and 65 percent of total expenditures, and the average amount that was identified as being shared and by which total expenditures were revised downward. The latter amount is trivial. To the extent that expenditures are thus overstated, the profits value will be too low.

A fourth hypothesis is that respondents truly have little idea about their sales. The schooling rates among Ivorian enterprise heads presented in Table IX corresponds with the occurring pattern of negative profits between industries: within each industry, enterprises with a head who had 3 years or more of schooling are a little less likely to have negative profits. Among Ghanaian enterprises, educated heads are *more* likely to report negative profits, except in commerce. Across industries, those with more educated entrepreneurs generally contain fewer enterprises with negative profits. A comparison between the income measures as in Table V turned up few other trends.

A fifth hypothesis puts the blame of reported outliers on those cases where the enterprise head (i.e., the "best informed person") was not actually interviewed. This was the case for only 5.1 percent of the Ivorian enterprise responses and 3.1 of the Ghanaian ones. A comparison as in Table V showed no trend that enterprise heads gave more consistent responses.[21]

TABLE IX
Education and the reporting of negative profits

	Percent of enterprises with an educated[a] head	Percent of enterprises with educated head and negative profits	Percent of enterprises with uneducated head and negative profits
CILSS			
Food commerce	16.9	41.3	47.4
Non-food commerce	24.7	30.4	41.4
Manufacturing	35.1	18.0	19.4
Services	38.2	23.8	8.8
GLSS			
Commerce	46.7	61.9	63.4
Food manufacturing	32.8	61.7	53.2
Services	60.2	40.6	25.7
Other manufacturing	43.0	27.2	23.8
Textiles manufacturing	70.2	32.2	24.3
Agriculture & mining	20.8	50.0	9.2

Note: [a] A person is labeled "educated" if (s)he has completed 3 years of schooling in Côte d'Ivoire or 6 years of schooling in Ghana.

V. Measures of enterprise size

Evidence about the quality of enterprise income variables may also be found in their correlation with either enterprise size or income determinants. Once again, we employ rank regression methods.[22] Enterprises are ranked according to capital stock and hours of family labor.[23] The Kruskal-Wallis χ^2 test statistics, which are reported in Table X, indicate whether rankings are significantly correlated.[24]

The profits variable is not significantly correlated with enterprise size, with few exceptions. In the Ghanaian commerce sector, we find a significant correlation, but the pattern is actually *negative*: enterprises that use comparatively more family labor report lower profits. In contrast, net revenue and earnings are almost always significantly positively correlated with both the capital stock and the hours of family labor. Test statistics are also reported for the ranking measure among themselves, to examine whether they are consistent. Test statistics are usually significant, but the pattern is occasionally U-shaped.

To illustrate the difference between the rankings of profits, net revenue and earnings, Figure 2 shows the average rank (median = 136.5) within each of the ten groups for the food commerce industry, with enterprises ranked by capital stock (subscript K, solid lines with closed symbols) and family hours of work (subscript L, dashed lines with open symbols).[25] The lines for profits (drawn with circles) lack the upward trend, whereas the lines for net revenue (triangles) and earnings (squares) generally rise.

The figure allows yet another conclusion. Note that the trend is clearer when family hours is used to rank observations. In large part, this owes to the fact that in the first capital-ranked group the average rank of enterprise income is substantially larger. Combined with the finding that the correlation between capital and family labor is sometimes U-shaped, this suggests fairly strongly that some enterprises that use capital did not report it. Alternatively, within the definition of the sector, firms could be heterogeneous, and the zero-capital group could be composed of a distinct segment of the sector: income would be based on some other productive characteristic and exceed that of low-capital firms the rest of the sector.[26]

TABLE X
Rank correlations between enterprise income variables and measures of enterprise size

Ranked by	Profit	Net rev.	Earnings	Capital	Family hours
		A: *Food commerce (CILSS)*			
Capital stock	19.1[b]	35.0[a]	40.4[a]	.	21.9[a]
Family hours	11.4	38.2[a]	58.7[a]	19.0[b]	.
		B: *Non-food commerce (CILSS)*			
Capital stock	6.0	52.6[a]	57.0[a]	.	46.2[a]
Family hours	10.0	37.6[a]	53.1[a]	30.7[a]	.
		C: *Commerce (GLSS)*			
Capital stock	4.8	153.1[a]	76.2[a]	.	117.1[a]
Family hours	23.5[a]	170.0[a]	139.8[a]	95.8[a]	.
		D: *Food manufacturing (GLSS)*			
Capital stock	13.2	72.7[a]	50.3[a]	.	28.1[a]
Family hours	11.4	71.1[a]	61.7[a]	39.3[a]	.

Notes: [a] Significant at 1 percent.
[b] Significant at 5 percent.

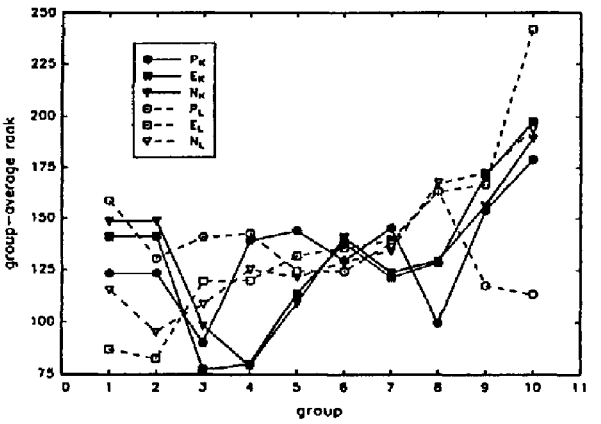

Fig. 2. Rank correlation between size and income, Ivorian food commerce.

VI. Conclusions and recommendations

Accurate measures of income from family enterprises are desirable from a number of perspectives. Studies of consumer demand, income distribution, and labor and capital productivity would benefit. This paper analyzed the quality of enterprise income measures obtained through a household survey. The benefit of a such survey is that one can study the small scale enterprises within the context of household decision making. The disadvantage relative to a focused enterprise survey is the brevity of the enterprise module within the overall survey. There is a trade-off between breadth and depth, between scope of the survey and the precision of the measured variables. When administering a household survey, one aims to minimize the sacrifice of precision by asking the "right" questions. This paper examines the Côte d'Ivoire and Ghana Living Standards Surveys which allow us a unique opportunity to evaluate three different enterprise income measures. There is no yardstick by which to evaluate those measures separately, but a comparison among them and with measures of enterprise size forms the foundation of the evaluation.

What do we learn from these comparisons? The following conclusions appear warranted. First, profits are calculated as the difference between total revenue and total expenditures. There is evidence that revenue is understated by some respondents and that expenditures are overstated, both leading to a profit value that is too low. Understatement of revenue may be caused by an understatement of domestic consumption of the enterprise's output and by barter of output for domestically consumed goods and services, though evidence on that is difficult to extract from the data. In any case, the resulting profits measure shows little correlation with the quantity of both family labor and capital stock, although it should contain the returns to both.

Second, earnings are calculated directly from a self-reported value, where it is only implicitly clear that the question probes for net returns to labor, rather than gross revenue from sales. There is evidence that a few respondents report gross revenue rather than their earnings.

Third, net revenue is also calculated from a self-reported value. Of the three enterprise income measures, it appears to be the cleanest, although there is hardly a rigid standard in these data to compare this measure with. It is disturbing, given the structure of the questionnaire, to see some respondents report more net revenue than total sales revenue: which measure would be right?

Overall, it is clear that the income measures may be fairly imprecise. Survey brevity, in its present form, imposes the cost of lower accuracy. One is easily tempted to suggest all kinds of additional questions to enhance detail. Yet the purpose of the household survey methodology lies in its scope; depth in one dimension may prevent one from fulfilling that goal. One must therefore target the more glaring shortcomings. We identify three flaws here. First, there is too much variation among the three income measures. Perhaps, responses are inconsistent; perhaps they are plainly wrong. Most likely, a substantial gain in accuracy is obtained when the interviewer in the field can spot discrepancies and confirm them with the respondent on a short notice. The interviewer might use a worksheet to derive a profits figure from the total revenue and expenditure responses that ought to be comparable to the net revenue response. He might also check the responses when they are keyed into the computer. Alternatively, since many enterprises do not use any accounting system, one may want to monitor inflows and outflows either personally or with diaries. Given the degree of variation in the three enterprise income measures, it is imperative to find some mechanism to improve accuracy.

Second, input sharing is more extensive than most questionnaire designers probably realize. Input sharing among enterprises leads to a false expenditure picture across the various enterprise within a household. Bartering and sharing of inputs or outputs with the household for purpose of consumption leads to an understated enterprise income. Proper accounting of input and output flows is necessary. At the same time, one might add, these non-financial transactions highlight the fact that consumption, production and time allocation are all part of one large complicated decision process.

Third, responses about business assets appear somewhat flawed in that some respondents are not revealing the value of their capital. Quite a few state, probably in order to hide their wealth, that they have no assets at all. Furthermore, this paper has not addressed the issue of spread in capital assets directly, but one might question a few of the extremely large enterprises.[27] Information on capital assets is essential for a household survey, and more effort in cajoling the right information out of the respondents is warranted. This could be in the form of a worksheet provided to the interviewer, with a good number of assets categories pre-printed but also some room for additions. The information should then be gathered in quantity and price per unit, so that outliers can be traced to their source.

Appendix: Aggregation of industry codes into broad industry categories

The CILSS survey uses a 30-category division of industries. For practical purposes (related to sample size and identifiability of family workers), these are aggregated into five broad groups as follows. Sample sizes are in parentheses.

(1) *Agriculture (N = 5)*
Agriculture
Forestry
Fishing/Hunting

(2) *Manufacturing (N = 111)*
Mining
Food
Textiles and Clothing
Leather and Shoes
Wood
Chemical
Rubber
Metal
Electrical Products
Utilities
Buildings and Construction
Other Industry

(3) *Services (N = 55)*
Transmission and Communication
Hotel and Restaurant
Technical Services
Financial Services
Education
Medical Services
Recreation
Personal Services
Public Administration
Other Services

(4) *Food Commerce (N = 272)*
Food Commerce

(5) *Non-Food Commerce (N = 186)*
General Commerce
Export
Other Commerce

The GLSS survey distinguishes 71 detailed industries, grouped into seven broad groups. The number of observations in GLSS88 and GLSS98 are separately indicated.

(1) *Fishing (N = 68 + 8 = 76)*
Fishing

(2) *Food Manufacturing (N = 33 + 201 = 534)*
Food Manufacturing
Beverage Industry
Tobacco Manufacturing

(3) *Textile Manufacturing (N = 86 + 38 = 124)*
Textile Manufacturing
Clothing Manufacturing

(4) *Agriculture/Mining (N = 50 + 46 = 96)*
Agricultural and Animal Products (Non-Farm)
Agricultural Services
Hunting
Forestry
Logging
Coal Mining
Petrol and Gas Products
Metal Mining
Other Mining

(5) *Other Manufact. (N = 154 + 111 = 265)*
Leather Manufacturing
Footwear — No Rubber
Wood Manufacturing
Wood Furniture
Paper Products
Printing
Basic Chemicals
Other Chemicals
Petrol Refinery
Petrol and Coal Derivatives
Rubber Products
Other Plastics
Pottery Manufacturing
Glass Manufacturing
Non-Metal Mineral Manufacturing

Iron/Steel Industry
Non-Ferrous Metal Industry
Non-Machine Metal Products
Non-Electrical Machine Manufacturing
Electrical Machine Manufacturing
Transportation Equipment Manufacturing
Photographic and Scientific Equipment
Other Manufacturing
Electricity/Gas/Steam
Water Works/Supply
Construction

(6) *Commerce (N = 928 + 544 = 1472)*
Wholesale Trade
Retail Trade

(7) *Services (N = 173 + 101 = 274)*
Restaurants
Hotels
Land Transport
Water Transport
Air Transport
Transportation Services
Communication
Financial Services
Insurance
Real Estate
Business Services
Machine Rental
Public Administration/Defense
Sanitary Services
Education
Research
Medical/Dental/Vetinary Services
Welfare Institutes
Union and Professional Associations
Other Social and Community Services
Entertainment
Library and Other Cultural Organization
Other Recreation
Other Repair
Laundry and Dry Cleaning
Domestic Services
Miscellaneous Personal Services
International Organizations

Notes

* Without implicating anyone for any remaining errors, I appreciated the comments and assistance of Paul Glewwe, Valerie Kozel, Kalpana Mehra, and the referees of the Journal.

[1] For evidence in the United States, see, e.g., Fain (1980), Becker (1984), and Haber, Lamas and Lichtenstein (1987). Storey and Johnson (1987) and Loveman and Sengenberger (1991) evaluate evidence from a number of industrial countries. For examples of Third-World evidence, see Gillis (1984, Indonesia), Pernia and Pernia (1986, Philippines), Cortes, Berry and Ishaq (1987, Colombia), Little, Mazumdar and Page (1987, India). In Africa, where the labor force will grow by 3.3 percent annually between 1990 and 2020, small and micro-enterprises are counted on to grow by 6 percent annually and thus absorb half of the new entrants into the labor force (World Bank, 1989).

[2] E.g., Heller et al. (1988), Portes, Castells and Benton (1989).

[3] Storey et al. (1987, Ch. 3), Greer (1989). Entrepreneurs must maintain records for purpose of taxation, but the quality of those records depends on the type of enterprise (sole proprietorship, partnership, or corporation). According to proper bookkeeping practice, expenses should be recorded as they are incurred. Small-scale entrepreneurs can get by with simpler practices, recording expenses as they are paid. This causes a discrepancy between the reported and the economically valid value of income.

[4] Steel (1977), Wilcock and Chuta (1982), Andersson (1987), Cortes, Ishaq and Berry (1987), Little, Mazumdar and Page (1987), Strassmann (1987), and many others surveyed in Page (1979) and Little (1987).

[5] Vijverberg (1988, 1991), and Moock, Musgrove and Stelcner (1990).

[6] It is not the purpose of this paper to determine what contributes to family enterprise income. Vijverberg (1991) employed the 1985 CILSS for a regression analysis to quantify the contribution of family labor and family capital. Estimates varied substantially between sectors, possibly owing to the small sample size, and variables that were expected to be important (education, experience) appeared to be irrelevant. Moock, Musgrove and Stelcner (1990) used the Peruvian LSS, which contained four times as many observations. They obtained more precise estimates of the contribution of education, with some interesting differences between the various sectors. Still, it was difficult to put forth a consistent picture of the contribution of family capital. They express somewhat of a disappointment about the low coefficient of determination of their regressions: "Coefficients of determination, however, are only 0.10 or a little more in urban areas, and still lower in the countryside" (p. 21). This compares with values of 0.40 or higher found for wage employees (Stelcner, Arriagada and Moock, 1988, App. A).

[7] Another example is Cortes, Berry and Ishaq (1987) who report: "Questionnaires sought information not only about outputs and inputs, but also about entrepreneurship, methods of production, technological characteristics, and growth prospects and constraints faced by the firms in the sample; cross-checks to test the quality of responses to some questions were built into the design." (p. 230) They tabulate variables such as educational attainment and employment background of the entrepreneurs, but they do not provide detailed information about the survey. In a recent survey in Ghana, Steel and Webster (1990) focus on the business environment of small-scale firms in Ghana. The 1-to-2-hour survey does not include quantitative information about inputs or outputs, but does inquire about the entrepreneur's background. The survey used by Andersson (1987) in Cameroon contains questions, besides the usual information about the enterprise, about parental occupation.

[8] In other words, if one is really interested in enterprises

only, a household survey would be inefficient survey instrument, drawing too many irrelevant observations.

[9] Specifically, an agency called *La Direction des Etudes et de la Recherche de l' Office National de Formation Professionelle.*

[10] Lavy and Newman (1989, p. 99).

[11] Only 1.2 percent (9 of 723) of the enterprise were not fully owned by members of the household, and half of these were owned for 50 percent.

[12] For various discussions, see Ainsworth and Muñoz (1986, Côte d'Ivoire), Grootaert (1986, Côte d'Ivoire), Grootaert and Arriagada (1986, Peru), and Scott and Amenuvegbe (1989, Ghana and Mauritania), and a detailed discussion by Ainsworth and Van der Gaag (1988).

[13] To avoid overlap, the agricultural and non-farm enterprise modules do not include the family labor input. This is significant since these two modules are covered during a second visit to the household, approximately two weeks after the first. The primary focus is on the performance of the enterprise during those two weeks, and therefore the time allocation information may be dated and is in fact occasionally inconsistent with enterprise responses.

[14] Pooling the sample is not an entirely innocuous research strategy. Since the survey is an overlapping sample, about half of the GLSS89 households were already interviewed in 1988, and their family enterprises are part of both the GLSS88 and the GLSS89 sample. This may undermine the i.i.d. assumption behind some of the test statistics reported below. On the other hand, this assumption may already be violated to some degree by the stratified nature of the sampling process: correlation between households from the same clusters may be nonzero.

[15] Inflation equalled 30 percent during the first year of the GLSS survey, and 24 percent during the second year.

[16] For example, suppose one household reports on three enterprises, two engaged in restaurants and one in transportation services. Two restaurants are aggregated into a single enterprise. Both aggregate enterprises are part of the service sector. Reasons for aggregation are (i) the identification of family labor inputs, and (ii) an effort to minimize the impact of input sharing across enterprises.

[17] As a percentage of the original samples, these losses amounted to 3.25 percent of the CILSS, 12.09 percent of the GLSS88, and 9.87 percent of the GLSS89.

[18] Losses ought to be reported in the economic activities module and under question C6 of the enterprise module as negative values. In practice, the survey was fielded under the assumption that enterprises would never drain the household's cash flow: interviewers were instructed not to accept a negative value for question C6, or for question 3 of the economic activities module.

[19] This was the central concern in Vijverberg (1986), where an econometric switching regression model was estimated on the 1985 CILSS data, in order to distinguish (i) firms which reported earnings as net returns from those which reported earnings as total revenue; and (ii) firms which reported total revenue as intended from those which reported total revenue as net returns. The results was, however, that apparently almost all enterprises reported earnings as net returns. On the other hand, over three-fourths of the enterprises appeared to respond with their net returns when gross revenue was asked for.

[20] Specifically, if two (or even three) enterprises report sharing a particular expenditure and if the reported value and time unit agree, the item is assumed shared between the enterprises, and the share within each enterprise is assumed equal to the relative value of total expenditures. Thus, if one enterprise reports sharing an input but the other enterprise benefitting from the sharing does not report on the input, no sharing has taken place according to this rule. Note that one cannot determine how much is shared with the household. This rule of identifying the quantity of inputs sharing is strict, but any other rule seems arbitrary.

[21] Only in the Ivorian food commerce sector, where someone else than the best informed person was interviewed in 8.1 percent of the enterprises, was the profit/earnings ratio noticeably lower.

[22] Regression analysis, as in Moock, Musgrove and Stelcner (1990) and Vijverberg (1991), would also uncover correlation of enterprise income with enterprise size and income determinant variables. As the Ordinary Least Squares regression technique is quite sensitive to outliers, we use the less sensitive technique of rank correlation. A more detailed analysis is left for the future.

[23] An alternative measure of enterprise size is the number of paid employees, but many enterprises do not hire workers for pay. Thus, the number of paid workers may only distinguish the "very large" family enterprises from all others.

[24] As before in Section 4, the observations are first ranked into 10 groups according to the value of the exogenous variable (e.g., capital stock). Based on this grouping, the test statistic is calculated from the within-group average rank scores of the endogenous variable (e.g., profits). Actually, the grouping is not necessary for the test statistic to be calculated, although a finer grouping could conceivably lead to more frequent rejection of the Null Hypothesis of no rank correlation.

[25] Formally, each group should contain only 10 percent of the observations. However, 28 percent of the food commerce enterprises report using no capital. When enterprises are ranked by their capital value, these 28 percent are grouped together; the second group contains the 2 percent that are formally left over from the third decile; and the other groups contain their usual 10 percent. Thus, there are only nine distinct groups when ranked by K. Figure 2 depicts the lowest group spread out over two decile groups, with the same average rank score.

[26] This analysis was repeated for the Ivorian non-food commerce and manufacturing sectors, with the same results.

[27] For example, one CILSS food commerce enterprise reports 60 percent of the total capital stock in the entire food commerce enterprise. The largest reported stock value in the CILSS service sector is 83.3 percent of the total stock in the service industry. Extreme values in the GLSS data are not as dramatic.

References

Ainsworth, Martha and Juan Muñoz, 1986, *The Côte d'Ivoire Living Standards Survey: Design and Implementation*, LSMS Working Paper 26, Washington, D.C.: The World Bank.

Ainsworth, Martha and Jacques van der Gaag, 1988, *Guidelines for Adapting the LSMS Living Standards Questionnaires to Local Conditions*, LSMS Working Paper 34, Washington, D.C.: The World Bank.

Andersson, Tommy D., 1987, *Profit in Small Firm: A Model Based on Case-Studies from the Informal Sector in a Developing Country*, Aldershot, England: Avebury.

Becker, Eugene H., 1984, 'Self-Employed Workers: An Update to 1983', *Monthly Labor Review* **107**(7), 14—18.

Cortes, M., A. Berry, and A. Ishaq, 1987, *Success in Small and Medium-Scale Enterprises: The Evidence from Colombia*, New York: Oxford University Press.

Fain, T. Scott, 1980, 'Self-Employed Americans: Their Number Has Increased', *Monthly Labor Review* **103**(11), 3—8.

Gillis, Malcolm, 1984, 'Episodes in Indonesian Economic Growth', in Arnold C. Harberger (ed.), *World Economic Growth: Case Studies of Developed and Developing Nations*, San Francisco: ICS Press.

Greer, Olen L., 1989, 'A Decision-Tree Approach to the Design and Implementation of Accounting and Information Systems for Small Business', *Journal of Small Business Management* **27**(1), 8—16.

Grootaert, Christiaan, 1986, *Measuring and Analyzing Levels of Living in Developing Countries: An Annotated Questionnaire*, LSMS Working Paper 24, Washington, D.C.: The World Bank.

Grootaert, Christiaan and Ana-Maria Arriagada, 1986, 'The Peru Living Standards Survey: An Annotated Questionnaire', mimeographed, Living Standards Measurement Study, Washington, D.C.: The World Bank.

Haber, Sheldon E., Enrique J. Lamas, and Jules H. Lichtenstein, 1987, 'On Their Own: The Self-Employed and Others in Private Business', *Monthly Labor Review* **110**(5), 17—23.

Hart, Keith, 1973, 'Informal Income Opportunities and the Structure of Urban Employment in Ghana', *Journal of Modern African Studies* **11**(1), 61—89.

Heller, P. S., A. L. Bovenberg, T. Catsambas, K. Y. Chu, and P. Shore, 1988, *The Implications of Fund-Supported Adjustment Programs for Poverty: Experiences in Selected Countries*, Occasional Paper 58, Washington, D.C.: International Monetary Fund.

Ho, S. P. S., 1980, *Small-Scale Enterprises in Korea and Taiwan*, World Bank Staff Working Paper 384, Washington, D.C.: The World Bank.

Holmes, Scott and Des Nicholls, 1988, 'An Analysis of the Use of Accounting Information by Australian Small Business', *Journal of Small Business Management* **26**(2), 57—68.

International Labour Organization, 1972, *Employment, Incomes and Equality: A Strategy for Productive Employment in Kenya*, Geneva: ILO.

International Monetary Fund, 1988, *International Financial Statistics*, Washington, D.C.: IMF.

Lavy, Victor and John L. Newman, 1989, 'Wage Rigidity: Micro and Macro Evidence on Labor Market Adjustment in the Modern Sector', *The World Bank Economic Review* **3**(1), 97—117.

Little, Ian M., 1987, 'Small Manufacturing Enterprises in Developing Countries', *The World Bank Economic Review* **1**(2), 203—237.

Little, Ian M., Dipak Mazumdar, and John M. Page, 1987, *Small Manufacturing Enterprises: A Comparative Analysis of India and Other Economies*, New York: Oxford University Press.

Loveman, Gary and Werner Sengenberger, 1991, 'The Reemergence of Small-Scale Production: An International Comparison', *Small Business Economics* **3**(1), 1—37.

Moock, Peter, Philip Musgrove, and Morton Stelcner, 1990, *Education and Earnings in Peru's Informal Nonfarm Family Enterprises*, LSMS Working Paper 64, Washington, D.C.: The World Bank.

Page, John M., 1979, *Small Enterprises in African Development*, World Bank Staff Working Paper 363, Washington, D.C.: The World Bank.

Pernia, Ernesto M. and Joseph M. Pernia, 1986, 'An Economic and Social Impact Analysis of Small Industry Promotion: A Philippine Experience', *World Development* **14**(5), 637—651.

Portes, Alejandro, Manuel Castell, and Lauren A. Benton, 1989, 'Conclusion: The Policy Implications of Formality', in Alejandro Portes, Manuel Castell, and Lauren A. Benton (eds.), *The Informal Economy, Studies in Advanced and Less Developed Countries*, Baltimore: The Johns Hopkins University Press.

Scott, Chris and Ben Amenuvegbe, 1989, *Sample Designs for the Living Standards Surveys in Ghana and Mauretania*, LSMS Working Paper 49, Washington, D.C.: The World Bank.

Steel, William F., 1977, *Small-Scale Employment and Production in Developing Countries: Evidence from Ghana*, New York: Praeger.

Steel, William F. and Leila M. Webster, 1990, *Small Enterprises in Ghana: Responses to Adjustment*, Industry Series Paper 33, Washington, D.C.: The World Bank.

Stelcner, Morton, Ana-Maria Arriagada, and Peter Moock, 1988, *Wage Determinants and School Attainment among Men in Peru*, LSMS Working Paper 38, Washington, D.C.: The World Bank.

Storey, David J. and S. Johnston, 1987, *Job Generation and Labour Market Change*, London: MacMillan Press.

Storey, David, Kevin Keasey, Robert Watson, and Pooran Wynarczyk, 1987, *The Performance of Small Firms: Profits, Jobs and Failures*, Beckenham, Kent, UK: Croom Helm Ltd.

Strassmann, W. P., 1987, 'Home-Based Enterprises in Cities of Developing Countries', *Economic Development and Cultural Change* **36**(1), 120—144.

Vijverberg, Wim P. M., 1986, 'Cost-Sharing and Net/Gross Revenue Reporting by Non-Agricultural Enterprises in the Côte d'Ivoire Living Standards Survey', mimeographed, Living Standards Measurement Study, Washington, D.C.: The World Bank.

Vijverberg, Wim P. M., 1988, *Non-Agricultural Enterprises in Côte d'Ivoire: A Descriptive Analysis*, LSMS Working Paper 46, Washington, D.C.: The World Bank.

Vijverberg, Wim P. M., 1991, 'Profits from Self-Employment: A Case Study of Côte d'Ivoire', *World Development* **19**(6), 683—696.

Wilcock, D. and E. Chuta, 1982, 'Employment in Rural Industries in Eastern Upper Volta', *International Labor Review* **121**(4), 455—468.

World Bank, 1989, *Sub-Saharan Africa: From Crisis to Sustainable Growth*, Washington, D.C.: The World Bank.