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# **The Composition and Distribution of Income in Côte d'Ivoire**

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# **The Composition and Distribution of Income in Côte d'Ivoire**

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LSMS Working Paper  
Number 68

# **The Composition and Distribution of Income in Côte d'Ivoire**

Valerie Kozel

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### ABSTRACT

Empirical work on the distribution of welfare typically uses total household consumption expenditures in lieu of total income in measuring welfare levels. However, households must produce income to obtain consumption goods, and thereby welfare levels. Thus the study of income determinants and composition is a necessary adjunct to the study of welfare distribution, and ultimately to the study of poverty.

The paper uses data collected under the auspices of the World Bank Living Standards Unit (now the Welfare and Human Resources Division, in the Population and Human Resources Department) in the Republic of Côte d'Ivoire in 1985. The major findings of the paper are (i) roughly one-third of private income is obtained in the wage sector, slightly less than one-third from agriculture, one-fifth from non-farm self-employment, and the remainder from a variety of other sources (imputed rents, rents and dividends, social security and pensions, private transfer payments); (ii) households obtaining income from wage activities are among the wealthiest (measured in terms of income and consumption) in the Côte d'Ivoire, while farm households are among the poorest; and (iii) physical assets, with the exception of land, tend to be highly concentrated in urban households at the upper end of the income distribution; in contrast, land is more equitably distributed in rural areas, and human capital, measured in terms of education, more equitably distributed in urban areas.



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## I. INTRODUCTION

Interventions designed primarily to maintain a household's living standard -- for example, food subsidies, transfers, public health care, and other social welfare programs -- are effective only in the short-term in alleviating the conditions of poverty. Longer-term solutions necessarily entail increased productivity and broader income earning opportunities for those most in need and therefore most vulnerable to income shortfalls. In developing strategies to improve the income earning potential of the poor, one must first identify what are the sources of income and what determines its absolute level (for example, fixed assets, land, labor, and human capital endowments). Low income is typically the result of low private asset endowments, augmented by problems of access to credit and critical public services, such as schools, health facilities, production subsidies in the form of fertilizer or seeds, extension services, and so on.

The paper takes a very careful look at the structure and distribution of income and private assets in the Republic of Côte d'Ivoire. The purpose is to construct a base of information which would allow one to identify some of the causes of income inequality and poverty levels, and to assess the impact of macroeconomic growth policies on future income levels and living conditions of the poor. The data used are from a 1985 survey of 1600 households conducted nationwide in the Côte d'Ivoire under the auspices of the World Bank, Living Standards Measurement Study. The Côte d'Ivoire Living Standards Survey (CILSS), described in detail elsewhere (Grootaert, 1986, Ainsworth and Muñoz, 1986), includes extensive information on earned income derived from wage activities, farming, and non-farm family enterprises, as well as unearned

sources of income. Information on productive and so-called non-productive assets is also available. Similar data were obtained from surveys in 1986 and 1987; an analysis of changes in income composition and distribution will be completed shortly.

The results presented here are disaggregated along two dimensions -- urban (Abidjan, other urban areas) versus rural location, and by income source categories. In the last case, five categories are used: (i) households wholly dependent on wage income, (ii) households wholly dependent on income from farming and livestock, (iii) households dependent on income from self-employment, but not solely farm earnings, (iv) households receiving income from both self-employment and wage activities, and (v) households who receive no earned income in the reference year. There is a high correspondence between the two classification schemes; for example, nearly all wage employment is located in large cities, while farming (and thereby farm income) is a predominantly rural phenomenon. This correspondence has important potential policy implications. If, for example, we were to find (as we have) that urban households are substantially better off than rural households, then growth policies designed to increase incomes and thereby improve the welfare of rural households to be effective must be oriented towards the agricultural sector or towards explicitly expanding the role of rural off-farm activities. Further, if urban wage earning households are found to be better off than their self-employed urban counterparts (as once again they are), then growth strategies directed at wage sectors (for example, modern large-scale industry) will not only exacerbate urban/rural welfare differentials, but will also worsen the distribution of income within urban areas.

The paper has three main sections and a short summary section. The first section describes how income has been measured, and analyzes component shares by region and productive activity category. The second section introduces a poverty dimension to the analysis, and discusses the distribution of income (by source) based on per capita income and adjusted per capita expenditure (or welfare) quintiles. The composition and distribution of household assets is the subject of the final main section. The paper concludes by a brief summary of research findings, policy implications, and directions for future work.

## II. COMPOSITION OF INCOME

Income is defined as the returns to household labor inputs and capital stocks, plus the annualized flow of services from durable goods and the housing stock. It has nine major components which are defined in Table 1: (i) wages; (ii) farm income; (iii) non-farm self-employment income; (iv) capital and interest income; (v) income from forced savings; (vi) other unearned income; (vii) private transfer income; (viii) imputed rents; and (ix) income from durable stocks. For purposes of this paper, no effort was made to impute a flow of income to time spent in home production activities (housework, child care, and the like), nor to leisure time -- in short, no effort was made to measure full income (see Becker, 1965, Gronau, 1976, Evenson and Quinzon, 1977).

Wage income is derived from Section 5 of the CILSS questionnaire, which describes time use and earnings for all individuals aged 7 years or older. Respondents described earnings and time inputs for up to four unique wage-paying jobs over the 12 month period preceding the interview. Information was solicited on in-kind as well as monetary payments; of the 785 individuals who described themselves as employees (out of a universe of 10,067 potential employees), some 43 percent received some form of in-kind payments, which constitute an average 12 percent of total wage remuneration. Note that 142 persons, or some 18 percent of employees, did not receive cash payments for their work. Upon inspection, the bulk of these appear to be young (15 to 25 years old) persons serving unpaid apprenticeships.

Table 1: Components of Household Income

Income Component	Description
1. Wage	Cash and in-kind income from employment
2. Farm	Net revenues from crop and livestock activities Net revenues from agriculture product sales
3. Non-farm Family Enterprise	Net revenues from non-farm self-employment
4. Capital and Interest	Land and buildings rental income, dividends and interest payments
5. Social Security, Pensions, etc.	Income from social security and pensions
6. Other Unearned Income	Income from grants, scholarships, gifts, dowery and inheritance, etc.
7. Private Transfer Income	Gross income from private transfer payments
8. Imputed Rents	Net imputed value of housing services from residing in one's own dwelling unit (rural households excluded)
9. Service Flows from Durables	Annual imputed value of services from durables

Table 2 shows average annual wages and hours worked per earner for total workers, public sector workers, and private sector workers (roughly forty percent and sixty percent of the total salaried labor force, respectively), by region. In all regions (although most markedly in Abidjan and in rural areas), employees in the public sector earn more than their private sector counterparts. However, as shown by van der Gaag and Vijverberg (1987), wage differentials primarily reflect differences in human capital

endowments (for example, work experience, educational attainment) rather than differential returns to endowments. For example, individuals employed in the public sector completed an average of 9.2 years of schooling, while private sector employees completed only 5.3 years of schooling. Not surprisingly, the within-region variance in private sector wages is higher than for public sector wages, reflecting greater heterogeneity of private sector activities -- low skill laborers are intermixed with senior-level managers.

Table 2: Average Annual Wages and Hours Worked per Earner in Côte d'Ivoire by Employment Sector and Region

	Abidjan	Other Urban	Rural	Total Country
Total Wages per Year (CFA)				
- overall	1,420,185	1,362,437	543,573	1,259,753
- public sector	2,164,657	1,518,032	1,358,278	1,784,851
- private sector	1,009,972	1,159,211	300,972	900,385
Percent of Wages Paid in Cash				
	89.4%	88.1%	88.1%	88.8%
Total Hours Worked Per Year				
- overall	2195	2169	1312	2041
- public sector	1926	2014	1413	1922
- private sector	2130	2005	1144	1897

Source: CILSS 1985 Survey estimates.

Farm income is derived from Sections 9 and 12 of the CILSS questionnaire. Section 9 is the source of all agriculture related measures except the value of home-produced agricultural goods consumed at home, which is drawn from Section 12. Following Singh and Asokan (1981), farm income is

defined as the returns to family labor and productive assets. It is calculated as the difference between gross farm income and expenditures on variable inputs, and includes (i) net income from crop sales, (ii) net income from livestock sales and changes in livestock holdings due to non-market transactions (gifts, births, deaths), (iii) net income from the sales of products made from agricultural outputs, (iv) the estimated value of agricultural outputs consumed at home, and (v) land and equipment rents.

Measurement problems were encountered in apportioning sharecropping income between the landlords and the sharecroppers; survey results indicate that sharecropping arrangements are more akin to a labor-buying than a land-leasing system in the Côte d'Ivoire. For the most part, the farmer retains control of the land and provides necessary inputs. The sharecropper essentially provides muscle, for which he or she receives one-half to one-third of total output. Most of the sharecropping arrangements in the sample involved cash crops, for example, coffee and cocoa. Sharecroppers in Côte d'Ivoire tend to be immigrants (or, autochtones) from other parts of the country or other West African countries, attempting to work their way into the rural economy in areas with a land abundance and rich growing conditions, (Ruf, 1984). It is important to note that only 36 percent of farm households surveyed claimed to be able to sell their land should they choose. For the remainder, hired labor or sharecropping arrangements are the only way to adjust factor proportions between land and labor inputs. Given this situation, it is not surprising that nearly 27 percent of all farm households participate in sharecropping arrangements.

Table 3: Composition of Farm Income in Côte d'Ivoire  
(CFA)

	<u>Gross Income</u>	<u>Expenditures</u>	<u>Net Income</u>	<u>Value of Home Consumption</u>	<u>Percentage Shares of Net Income</u>
Crop Production	836,726	187,264	649,462	285,328	88.2
Livestock	41,317	4,315	37,002	13,104	5.0
Agriculture Product Sales	37,765	1,483	36,282	-	4.9
Agriculture Rents	16,536	3,168	13,368	-	1.9
Total Agriculture Activities	<u>932,344</u>	<u>196,230</u>	<u>736,114</u>	<u>298,432</u>	<u>100.0</u>

Source: 1985 CILSS Survey estimates.

Table 3 shows the composition of agricultural income in the whole country. In our estimates, the average annual value of farm output (including outputs consumed at home) is CFA 932,344 per household, which is produced at a cost of 21 percent of gross output, or CFA 196,230, and thus yields a net farm income of CFA 736,114 per household. Farm output is mainly derived from crop cultivation. The value of home-consumed goods constitutes some 40 percent of the average value of net farm output (CFA 285,328 for crop consumption, and CFA 13,104 for consumption of livestock-related outputs). Table 4 shows the composition of net farm income stratified by the three major agricultural regions in Côte d'Ivoire -- West Forest, East Forest, and the Savannah. Farmers in the West and East Forests earn significantly more on average than do farmers in the northern Savannah region. In all cases, however, income

from crop cultivation constitutes the main portion of total income from farming activities.

Table 4: Composition of Net Farm Income in Côte d'Ivoire by Agricultural Region

	West Forest (N=239)		East Forest (N=478)		Savannah (N=329)	
	Avg. CFA	Percent	Avg. CFA	Percent	Avg. CFA	Percent
Crop Production	829,675	88.1	721,582	88.8	413,765	87.6
Livestock	37,330	4.0	39,775	4.9	32,737	6.9
Agriculture Product Sales	69,967	7.4	24,425	3.0	26,133	5.5
Agriculture Rents	4,790	0.5	27,168	3.3	-448	0.0
Total Net Income	<u>941,852</u>	<u>100.0</u>	<u>812,950</u>	<u>100.0</u>	<u>472,187</u>	<u>100.0</u>

Source: 1985 CILSS Survey estimates.

Income from non-farm self-employment is derived from Sections 5 and 10 of the CILSS questionnaire. Severe problems were encountered in attempting to compute the measure based on Section 10 alone, although this was the intended purpose of the section. Section 10 has three parts; (i) information on revenues and structure of the family enterprise, (ii) information on business expenditures, and (iii) an accounting section on business assets. Information is collected for a maximum of three enterprises per household. On average, a third of these were managed by the household head, a third by his/her spouse, and the remainder by some other household member. Over 50 percent of enterprises sold foodstuffs, and 25 percent were involved in other forms of commerce.

Based on the data reported for Section 10, 65 percent of enterprises reported negative profits. Clearly these figures are not realistic. Evidence suggests that spurious net revenue estimates are caused by an underestimate of gross business revenues. It is particularly difficult to obtain estimates of gross revenues for small enterprises (involving one or two family members), which constitute over 80 percent of all enterprises sampled in the CILSS, probably because the budget for the business and the budget for the household are seldom maintained separately.

Consider the following example: A woman makes meat pies at home to sell at noon: she buys meat, vegetables, and flour in bulk. She uses some of the flour to make bread for the family (which the questionnaire attempted to account for), some of the vegetables for dinner, and her children take some of the meat pies to school for lunch (also supposedly accounted for in the questionnaire). She makes a tray of pies and goes to the market to sell them. Later in the day, she gives some of the money received from sales to one of her children for school supplies. She stops on her way home and buys rice and milk for the next day's meals. After she gets home, a man from a CILSS survey team comes to ask some questions about her "business" (selling meat pies). In particular, he asks her to estimate her total revenues since the last visited (roughly two weeks ago). What he would like her to do is estimate the number of meat pies sold and multiply by some price per pie. What she does may be very different, however. For example, she might think of the money in her pocket at the end of the day, which means that her reply would reflect net business revenues minus payments for household consumption expenditures. Alternatively, if she buys supplies in bulk and infrequently, the money in her pocket might represent gross revenues minus some payments for

household consumption expenditures. Recent field experiments suggest that both kinds of responses are not infrequent, and are far more typical of an individual's responses than attempts to estimate actual measures of gross business revenues. In either case, our prototypical respondent does not think of her business budget as logically separate from the household budget.

Because of this problem, net income from family businesses is estimated using a mix of information from Section 10 and Section 5 (which describes individual time use and earnings). This requires that individuals be merged across households in Section 5 and enterprises be merged across households in Section 10 (it is not possible to obtain an accurate match of individuals with enterprises). Finally, information is matched between the two sources at a household level. Thus, the basic unit of observation is the household rather than the individual enterprise for income estimates, and enterprise level information cannot be fully recovered.

Table 5 shows average business revenues and expenditures per household involved in non-farm self-employment for Abidjan, other urban areas, and rural areas, further stratified by a proxy measure for large (net revenues greater than CFA 3,000,000 per annum) and small enterprise households. Thirty seven percent of all households in Côte d'Ivoire report some non-farm business activity, which encompasses 46 percent of households in Abidjan, 54 percent of households in other urban areas, and 27 percent of rural households.<sup>1/</sup> Net

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<sup>1/</sup> These percentages are slightly different than those obtained by dividing counts in Table 3 due to a slight underreporting of business activities in the section of the questionnaire dealing specifically with family enterprise activities (Section 10), rectified through use of information from the general employment section (Section 5).

Table 5: Non-Farm Self-employment Income and Expenditures per Household by Region  
in Côte d'Ivoire  
(CFA)

	Number of Households	Gross Revenues	Total Expenditures	Net Revenues
<u>Abidjan</u>				
Large Enterprise Households (>3,000,000 CFA/Year)	17	45,452,463	37,854,213	7,598,250
Small Enterprise Households (<3,000,000 CFA/Year)	137	1,780,137	1,122,959	657,178
Total Households	154	6,601,108	5,177,708	1,423,400
<u>Other Urban Areas</u>				
Large Enterprise Households (>3,000,000 CFA/Year)	7	7,107,402	3,213,464	3,893,938
Small Enterprise Households (<3,000,000 CFA/Year)	179	1,942,746	1,399,013	679,915
Total Households	186	2,138,165	1,467,299	801,527
<u>Rural Areas</u>				
Large Enterprise Households (>3,000,000 CFA/Year)	7	9,371,968	4,518,736	4,853,231
Small Enterprise Households (<3,000,000 CFA/Year)	247	1,676,867	1,341,638	374,960
Total Households	254	1,892,330	1,429,196	500,351
<u>Total Country</u>				
Large Enterprise Households (>3,000,000 CFA/Year)	31	28,646,692	22,504,743	6,141,949
Small Enterprise Households (<3,000,000 CFA/Year)	563	1,787,036	1,306,667	541,530
Total Households	594	3,200,702	2,412,963	836,289

Source: 1985 CILSS Survey estimates.

and gross business incomes are on average highest in Abidjan and lowest in rural areas, and a greater proportion of households have "large" businesses (in a revenue sense) in Abidjan than in other regions of the country.

Capital and interest income is derived from Section 14 of the CILSS questionnaire, and includes rents on buildings and land (with the exception of land used for agriculture), dividends, and interest payments. Income from "forced" savings includes payments from pension plans and social security, which are also reported in Section 14. Information on private transfer payments is also provided in Section 14. Some 23 percent of households in the Côte d'Ivoire receive income through private support systems, with the vast majority of payments received from individuals related by blood or marriage.

Two imputations are made for total household income estimates, one for the annual value of housing services (net of maintenance costs) for home owners, and one for an imputed annual stream of income from durables owned by the household. These imputations are described in detail in Annexes I and II for housing and durables, respectively. Imputed rents were estimated using selectivity-corrected hedonic rent equations (see Heckman, 1979, Lee and Trost, 1978, Malpezzi, et al., 1985). An estimate of the annual flow of services from durables is simply computed as the product of the annual depreciation rate times the present value of the durable, summed over the total stock of durable goods owned by the household (van der Gaag, mimeo, 1984).

Table 6 shows the percentage of households receiving income in each of the nine income categories, average income per household, and category shares by region and for the country as a whole. From this table, it is clear

that income sources vary significantly between regions. In Abidjan, for example, 71.6 percent of households have at least one member working for wages, and 45.8 percent receive income from non-farm self-employment. In contrast, only 10.5 percent of rural households receive wage income and 27.2 percent receive non-farm family enterprise income. However, nearly all rural households (93.5 percent) receive income from farm activities, while few urban households do (4.5 percent). The category labeled "other urban areas" typically evidences a pattern of income composition that lies between Abidjan's and that of rural areas -- urban households are more likely to receive wage income than rural households, less likely to receive farm income, but more likely to receive non-farm self-employment income than either households in Abidjan or rural areas.

It is interesting, although not surprising, to find that some 24.6 percent of households receive income from pensions or social security payments in Abidjan, while only 16.9 percent do in other urban areas, and 1.6 percent in rural areas. The reasons for this are simple; only individuals who hold government or private sector jobs are eligible for pensions (government) or social security (private sector) coverage upon retirement, and most employees work in urban areas. The poverty implications are important, however. Rural households almost entirely lack access to official safety nets, and instead must depend on community or kinship ties in times of need. This may increase their vulnerability to exogenous income shocks (such as those caused by droughts). Rural households also receive little income from rents or dividends in contrast to urban households, further exacerbating potential problems.

Table 6: Composition of Household Income in Côte d'Ivoire

	Abidjan (N=334)			Other Urban (N=322)			Rural (N=898)			Total Country (N=1564)		
	Percent Receiving	Average Income CFA	Percent Share	Percent Receiving	Average Income CFA	Percent Share	Percent Receiving	Average Income CFA	Percent Share	Percent Receiving	Average Income CFA	Percent Share
(1) Annual Wage Income	71.6	1,454,201	51.5	52.1	907,291	46.9	10.5	65,628	6.4	32.4	540,830	33.8
(2) Net Agriculture Income	4.5	42,431	1.5	41.6	188,148	9.7	93.5	766,838	75.0	63.5	489,295	30.6
(3) Net Income from Family Enterprises	45.8	652,961	23.1	53.6	437,669	22.6	27.2	136,141	13.3	36.8	310,517	19.4
(4) Rents and Dividends	26.9	276,672	9.8	25.6	107,593	5.6	8.5	19,259	1.9	16.0	92,982	5.8
(5) Income from Social Security Pensions, etc.	24.6	90,052	3.1	16.9	53,276	2.8	1.6	3,911	0.4	9.7	32,786	2.0
(6) Other Unearned Income (gifts, Scholarships, etc.)	37.7	99,986	3.5	40.1	37,141	1.9	25.6	14,540	1.4	31.3	37,585	2.3
(7) Gross Annual Transfer Income	21.9	69,099	2.5	24.4	19,902	1.0	23.5	7,343	0.7	23.3	23,197	1.5
(8) Imputed Rents for Urban Homeowners	22.5	97,145	3.4	44.6	150,032	7.8	-	- <sup>1/</sup>	-	14.3	52,594	3.3
(9) Annual Value of Durables	91.3	40,463	1.5	92.2	33,841	1.7	73.1	8,936	0.9	81.0	20,955	1.3
Total Annual Household Income	-	2,823,011	100.00	-	1,934,893	100.00	-	1,022,597	100.00	-	1,600,743	100.00

Notes: <sup>1/</sup> No imputations were made for rural areas due to the general absence of a housing rental market, and constraints on property sales.

Source: 1985 CILSS Survey estimates.

Based on compositional share estimates, wages form an important component of income in urban areas, followed by income from non-farm family enterprises. Rural incomes are composed primarily of agricultural earnings (75 percent of the total); only 20 percent is derived from non-farm self-employment and wage activities. Overall, nearly a third of household income in the Côte d'Ivoire is derived from wages, slightly under a third from agriculture, roughly a fifth from non-agriculture family enterprises, and the remainder from a variety of other sources (rents, pensions, social security, and so on). It is important to note that some 20 to 25 percent of income in urban areas is derived from indirect or "unearned" sources, while only 5 percent of rural income is obtained from sources not directly related to income generating activities. Clearly rural households are heavily dependent on earned income and informal support networks to secure and maintain a basic livelihood.

According to Table 6, urban households earn nearly two-and-one-half times as much on average as rural households. In Abidjan, for example, average household income is some CFA 2.8 million annually, as compared to CFA 1.9 million in urban areas outside Abidjan, and only CFA 1.0 million in rural areas. Even accounting for cost-of-living differences (see Glewwe, 1987), urban households are significantly better off on average than their rural counterparts.

Households, besides the regional classifications, were further classified by the type of productive activities from which they derive income. Specifically, we define five categories: (i) households wholly dependent on wage income (16.7 percent); (ii) households wholly dependent on

income from agricultural activities (livestock and crop cultivation) (39.6 percent); (iii) households dependent on income from self-employment, but not solely farm income (26.0 percent); (iv) households receiving both wage and self-employment income (16.1 percent); and (v) households receiving no earned income (1.7 percent). Note that the two classification schemes are not independent of one another; for instance, nearly 94 percent of households dependent on earnings from agricultural activities live in rural areas, while over 92 percent of households dependent on wage earnings live in cities.

Table 7 shows the distribution of households and average total and adjusted per capita<sup>2/</sup> income by region and activity classification. In Table 7, some 72 percent of households in Abidjan obtain income from wage activities, and nearly two-thirds of these (48.4 percent overall) receive only wages. In Abidjan, 23.7 percent of households receive only income from self-employment. In contrast, 88.4 percent of rural households are dependent on self-employment income (64.7 percent farm, 23.7 percent mixed farm and non-farm self-employment), 9 percent receive both wages and self-employment income, and only 1.7 percent depend solely on wage activities for earned income. The wealthiest households in Abidjan evidence the most diversified labor portfolios - members work in both the wage and non-wage sectors. However, on a per capita basis, wage dependent households are wealthier in Abidjan; households in the wage/self-employment category tend to be large and

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<sup>2/</sup> Adult equivalency measures (Glewwe, 1987) are used to construct per capita estimates. Children between 0 and 6 years are assigned a weight of .2, between 7 and 12 years a weight of .3, and between 13 and 17 years a weight of .5. All others are assigned a weight of 1.0.

Table 7: Total and Adjusted Per Capita Income by Region and Activity Classification in Côte d'Ivoire

	Abidjan			Other Urban			Rural			Total Country		
	Percent of Households	Average Income	Adjusted Income Per Capita	Percent of Households	Average Income	Adjusted Income Per Capita	Percent of Households	Average Income	Adjusted Income Per Capita	Average Income	Adjusted Income Per Capita	
		CFA	CFA		CFA	CFA		CFA	CFA	CFA	CFA	
Wage Income Only (N=260)	48.4	3,083,596	860,719	25.3	2,862,377	898,785	1.7	1,179,492	346,900	16.7	2,902,273	843,374
Farm Income Only (N=618)	0.9	n.a. <sup>1/</sup>	n.a.	10.5	1,138,950	201,138	64.7	877,722	179,527	39.6	892,290	180,193
Non-farm Self-Employment Income, Farm and Non-Farm Self-Employment Income (N=408)	23.7	1,910,783	482,461	34.0	1,494,993	316,385	23.7	1,346,780	260,017	26.0	1,498,418	319,245
Wage and Self-Employment Income (N=251)	23.4	3,551,823	610,597	27.7	2,069,236	348,019	9.0	1,245,948	248,438	16.1	2,264,278	397,481
No Earned Income (N=27)	3.6	1,069,084	403,719	2.4	347,181	180,624	0.8	877,851	148,775	1.7	661,032	247,504
<u>Total Country (N=1564)</u>	<u>100.0</u>	<u>2,823,011</u>	<u>688,136</u>	<u>100.0</u>	<u>1,934,893</u>	<u>457,084</u>	<u>100.0</u>	<u>1,022,597</u>	<u>206,848</u>	<u>100.0</u>	<u>1,600,743</u>	<u>362,748</u>

Notes: <sup>1/</sup> Too few entries in cell for reporting.

Source: CILSS 1985 Survey tabulations

evidence relatively high dependency ratios in all regions. Wage dependent households are wealthier according to both criteria in other urban areas. In rural areas, households obtaining income from some form of off-farm activity are clearly better off on average than households solely dependent on farm earnings.

These results combined with earlier findings (on income and economic activities) suggest: first, individuals in the wage sector (representing 32.8 percent of households overall) tend to earn significantly more on average than self-employed individuals; and second, there is convincing evidence, however, that many off-farm employment activities, both in urban and rural areas, yield significant income levels. Based on the evidence reported here, it is clear that the self-employed are a heterogeneous group that cannot simply be characterized as marginal, underemployed members of the so-called informal sector (although the characterization undoubtedly applies to some self-employed workers). In Section III it will be shown that self-employed workers are represented across the range of the welfare distribution in the Côte d'Ivoire - they are drawn from some of the poorest and some of the wealthiest households in the country.

### III. INCOME DISTRIBUTION

The ability to monitor changes in income distribution is a critical aspect of development planning. Economic and social policy will inevitably affect different groups in different ways; it is often the intention of policy to redress imbalances and shift the burden of economic adjustments from one group to another. Survey data can serve an important function in helping to identify the poor and to assess the impacts of policy interventions.

Previous work (Glewwe, 1987) explored the distribution of welfare (that is, consumption expenditures) in the Côte d'Ivoire, and identified important economic and demographic characteristics of the poor (defined variously as the lower 10 percent and lower 30 percent of the welfare distribution). This section analyzes the distribution of income and explores the relationship between household income and consumption expenditures. As expected, income is found to be more variable and highly skewed than consumption. There are a number of possible explanations for this -- exogenous income shocks brought about by such causes as weather and price changes, life cycle effects, and various types of credit or liquidity constraints. In general, total consumption expenditure is assumed to be a better proxy measure of long-term household welfare than annual income. Poverty assessments based on income rather than welfare estimates yield very different results.

Table 8 shows household income composition by adult equivalency adjusted per capita income quintiles for Abidjan, other urban areas, and rural areas (quintile 1 represents the poorest households, while quintile 5 represents the wealthiest). There are several important income composition

Table 8: Composition of Household Income in Côte d'Ivoire, by Region and Adjusted Per Capita Income Quintile within Each Region <sup>1/</sup>

	Wage Income	Farm Income	Non-Farm Family Enterprise Income	Capital and Interest Income	Social Security Pensions, etc.	Other Unearned Income	Private Transfer Payments	Inputed Rent	Service Flows from Total Durables	Total Income
<b>Abidjan</b>										
Quintile 1	41.3	-0.7	34.5	2.2	10.2	2.2	3.5	5.2	1.6	100.0
Quintile 2	48.3	0.5	26.1	5.9	5.8	3.3	1.8	6.1	1.6	100.0
Quintile 3	50.9	1.0	16.6	13.4	7.3	1.7	2.9	4.6	1.6	100.0
Quintile 4	52.9	0.2	19.4	11.0	2.9	4.6	3.1	4.4	1.3	100.0
Quintile 5	52.4	2.6	24.8	9.7	1.3	3.6	2.1	2.1	1.4	100.0
<b>Total</b>	<b><u>51.5</u></b>	<b><u>1.5</u></b>	<b><u>23.1</u></b>	<b><u>9.8</u></b>	<b><u>3.1</u></b>	<b><u>3.5</u></b>	<b><u>2.4</u></b>	<b><u>3.4</u></b>	<b><u>1.4</u></b>	<b><u>100.0</u></b>
<b>Other Urban Areas</b>										
Quintile 1	8.7	21.0	24.5	2.1	2.3	1.2	5.9	31.7	2.6	100.0
Quintile 2	24.5	25.5	21.4	5.9	1.6	1.9	1.1	16.1	1.9	100.0
Quintile 3	29.1	12.1	28.8	9.1	4.4	1.2	1.6	12.0	1.7	100.0
Quintile 4	45.5	8.1	27.7	4.4	3.5	2.0	0.8	6.4	1.6	100.0
Quintile 5	66.7	3.9	16.5	5.1	1.9	2.2	0.4	1.6	1.7	100.0
<b>Total</b>	<b><u>46.9</u></b>	<b><u>9.7</u></b>	<b><u>22.6</u></b>	<b><u>5.6</u></b>	<b><u>2.8</u></b>	<b><u>1.9</u></b>	<b><u>1.0</u></b>	<b><u>7.8</u></b>	<b><u>1.7</u></b>	<b><u>100.0</u></b>
<b>Rural Areas</b>										
Quintile 1	2.1	85.0	6.4	0.6	0.0	0.8	2.3	- <sup>2/</sup>	2.8	100.0
Quintile 2	1.3	87.0	7.2	0.3	0.2	0.8	1.7	-	1.4	100.0
Quintile 3	1.6	85.8	8.6	0.3	0.4	1.1	1.1	-	1.0	100.0
Quintile 4	4.3	78.7	12.5	1.8	0.4	1.1	0.6	-	0.7	100.0
Quintile 5	10.2	66.8	16.9	2.8	0.4	1.8	0.3	-	0.6	100.0
<b>Total</b>	<b><u>6.4</u></b>	<b><u>75.0</u></b>	<b><u>13.3</u></b>	<b><u>1.9</u></b>	<b><u>0.4</u></b>	<b><u>1.4</u></b>	<b><u>0.7</u></b>	<b><u>-</u></b>	<b><u>0.9</u></b>	<b><u>100.0</u></b>

Notes: <sup>1/</sup> Quintile 1 is the lowest, Quintile 5 is the highest consumption group.  
<sup>2/</sup> No imputations made for rural areas.

Source: CILSS Survey estimates.

characteristics in the Côte d'Ivoire evident from the table. The most important perhaps is that the share of wage income tends to increase with rising per capita income. This effect is most marked for households residing outside Abidjan (8.7 percent of income is derived from wages in the lowest quintile in other urban areas, as compared to 66.7 percent in the highest quintile, and a scant 2.1 percent of income is derived from wages in the lowest rural quintile, as compared to 10.2 percent in the highest quintile), but still apparent within Abidjan (41.3 percent in the lowest quintile, and 52.4 percent in the highest quintile). There is a slight drop in the wage share for households in Abidjan's highest income quintile, primarily due to the increasing importance of rising income from (large) family enterprises.

Table 9 shows the composition of household income stratified by adult equivalency adjusted per capita consumption quintiles rather than income quintiles. If consumption is a better measure of long-term welfare, the estimates in this table should be less sensitive to transitory income shifts and should better reflect the relationship between current income and welfare. On the role of wage income: not surprisingly, the effects seen in Table 8 remain and are strengthened by the new groupings; clearly the share of wage income in total income rises as levels of welfare rise, increasing from 40.4 percent of total income in the lowest consumption quintile to 59.5 percent of income in Abidjan's highest quintile, and 23.3 percent rising to 78.3 percent in the highest quintile in other urban areas.

Non-farm entrepreneurial earnings are derived from a very heterogeneous set of activities which span the income distribution in the Côte d'Ivoire. For example, in Abidjan they constitute a major source of income

for the very poor (a 34.5 percent share at the lowest end of the distribution) and for the comparatively rich (24.8 percent of income for the upper 20 percent of the per capita income distribution). This may represent two kinds of family enterprises: (1) small, one or two person operations which yield little cash revenues, and (2) larger enterprises that employ a number of workers outside the households as well as within.<sup>3/</sup> Analysis of the family enterprise data bears this out; we find more food sellers and petty traders at the lower end of the income distribution, and much of the construction, large traders, and industry at the upper end. Small enterprises operated by poor households tend also to have low capital endowments and limited inventories.

The distribution of non-farm family enterprise income is different in regions outside Abidjan, particularly rural areas. There, the share of income from family enterprises clearly increases as income levels increase, indicating the importance of labor diversification and the age-old adage that wealth begets wealth. Farm households that diversify their labor portfolio are clearly better off than those that do not. In urban areas outside Abidjan, family enterprise income constitutes a reasonably small share of total income for the very poor (income quintile 1, with a share of 24.5 percent), a smaller share for the rich (income quintile 5, with a share of 16.5 percent) and a larger share for the middle classes, averaging around 27 or 28 percent of total income.

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<sup>3/</sup> Or, alternatively, the effect of measurement error which causes a substantial understatement of net earnings from family enterprises.

Table 9: Composition of Household Income in Côte d'Ivoire, by Region and Adjusted Per Capita Expenditure Quintile within each Region 1/

	Wage Income	Farm Income	Non-Farm Family Enterprise Income	Capital and Interest Income	Social Security Pensions, etc.	Other Unearned Income	Private Transfer Payments	Imputed Rent	Service Flows from Durables	Total Income
<b>Abidjan</b>										
Quintile 1	40.4	1.0	35.5	7.9	4.6	3.3	1.7	4.5	1.1	100.0
Quintile 2	43.0	0.4	22.7	13.6	10.4	2.2	2.1	4.5	1.1	100.0
Quintile 3	42.3	0.2	35.5	8.2	3.3	1.6	1.6	6.0	1.2	100.0
Quintile 4	55.6	0.5	21.1	10.7	1.6	4.8	1.9	2.4	1.3	100.0
Quintile 5	59.5	3.4	15.3	8.8	1.1	4.1	3.7	2.3	1.9	100.0
<b>Total</b>	<b>51.5</b>	<b>1.5</b>	<b>23.1</b>	<b>9.8</b>	<b>3.1</b>	<b>3.5</b>	<b>2.5</b>	<b>3.4</b>	<b>1.4</b>	<b>100.0</b>
<b>Other Urban Areas</b>										
Quintile 1	23.3	22.7	34.2	1.6	2.6	1.0	1.0	12.5	1.2	100.0
Quintile 2	22.4	24.0	24.2	7.2	3.3	1.5	1.6	14.3	1.5	100.0
Quintile 3	33.1	10.1	36.7	4.2	3.8	1.2	0.8	8.4	1.6	100.0
Quintile 4	47.3	7.1	20.9	7.8	3.9	4.0	0.5	7.0	1.5	100.0
Quintile 5	78.3	-1.1	9.1	5.3	0.8	1.2	1.4	2.5	2.5	100.0
<b>Total</b>	<b>46.9</b>	<b>9.7</b>	<b>22.6</b>	<b>5.6</b>	<b>2.8</b>	<b>1.9</b>	<b>1.0</b>	<b>7.8</b>	<b>1.7</b>	<b>100.0</b>
<b>Rural Areas</b>										
Quintile 1	1.5	82.7	12.9	0.1	0.0	0.6	1.0	- 2/	1.2	100.0
Quintile 2	3.8	74.7	13.1	1.2	0.7	4.5	0.8	-	1.1	100.0
Quintile 3	3.6	76.8	15.5	1.0	0.2	1.0	1.0	-	0.8	100.0
Quintile 4	11.7	72.3	12.4	0.8	0.3	1.0	0.7	-	0.8	100.0
Quintile 5	7.4	73.6	13.0	3.8	0.4	0.7	0.4	-	0.8	100.0
<b>Total</b>	<b>6.4</b>	<b>74.9</b>	<b>13.3</b>	<b>1.9</b>	<b>0.4</b>	<b>1.4</b>	<b>0.7</b>	<b>-</b>	<b>0.9</b>	<b>100.0</b>

Notes: 1/ Quintile 1 is the lowest, Quintile 5 is the highest consumption group.  
2/ No imputations made for rural areas.

Source: CILSS Survey estimates.

Table 9 suggests a different story for the role of non-farm entrepreneurial income. In Abidjan and other urban areas, the income shares tend to fall with increasing expenditure levels, and are lowest in the highest expenditure quintiles (15.3 percent and 9.1 percent for Abidjan and other urban areas, respectively). Further, in rural areas the distribution of family enterprise income shares is roughly equal across the welfare (consumption) distribution. In all likelihood, this reflects the transitory nature of most kinds of non-wage income in the Côte d'Ivoire. If income from family enterprises has a significant transitory component, then the correlation between consumption (a proxy for permanent income) and family enterprise income would be less than the correlation in a particular time period between household income and family enterprise income. The stability of wage income shares across income and consumption deciles lends credence to this explanation.

The share of income derived from agriculture falls with increasing income levels and consumption expenditures in all regions. Farm income also probably has a relatively high transitory component, although perhaps less than non-farm family enterprise income. The flattening found in the distribution of farm income shares across rural consumption quintiles tends to bear this out.

As noted earlier, other sources of income constitute a fairly small share of total income in the Côte d'Ivoire. Capital (rents) and interest income are evenly spread throughout mid-to-upper levels of both income and consumption distributions, and transfers and remittances constitute a slightly higher share of income for households at the lower end of the distribution

living outside of Abidjan. Social security and pension payments, whether grouped by income or consumption quintiles, constitute a larger share of total income for households at the lower end of the relevant distributions. This reflects life cycle differences rather than differences in wealth, as only retired employees (who we have already seen to be in the most wealthy segment of the population) are eligible for social security and pension benefits.

Table 10 combines the information in Table 9 across regions and across selected income source categories, showing the price-adjusted <sup>4/</sup> composition of income by per capita expenditure decile for the country as a whole. Based on these estimates, it is clear that the share of wage income in total private income increases with total consumption expenditures for the country as a whole (2.5 percent in the lowest decile to 63.4 percent in the highest); the share of farm income falls steadily (78.0 percent to 4.6 percent); family enterprise income initially rises and then falls; rent and dividend income increases steadily with per capita consumption levels (0.5 percent rising to 9.8 percent of total income); and other income is a relatively small share of the total at the lower end of the welfare distribution, and a fairly constant share (approximately 10 percent) across mid-to-upper ranges.

What does all this suggest for poverty and income in the Côte d'Ivoire? Households receiving a large share of total income from wages appear fairly well off, as do households receiving income both from wage

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<sup>4/</sup> Regional prices indices (Glewwe, 1987) were used to adjust income shares to account for cost-of-living differences between regions.

Table 10: Composition of Household Income <sup>1/</sup> in Côte d'Ivoire  
by Per Capita Expenditure Decile

	Wage Income	Agriculture Income	Family Enterprise Income	Rents and Dividends	Other Income	Total Income
Decile 1	2.5	78.0	14.9	0.5	4.1	100.0
Decile 2	8.7	69.1	14.0	2.3	5.9	100.0
Decile 3	5.8	61.1	21.1	1.6	10.3	100.0
Decile 4	10.2	58.5	21.8	0.9	8.5	100.0
Decile 5	21.1	48.8	16.2	4.8	9.2	100.0
Decile 6	22.2	41.2	22.0	3.8	10.7	100.0
Decile 7	22.2	30.0	29.0	6.9	11.9	100.0
Decile 8	29.6	34.4	18.7	6.5	10.7	100.0
Decile 9	43.6	16.7	20.7	7.2	11.8	100.0
Decile 10	63.4	4.6	13.6	8.1	10.2	100.0
Total	32.5	32.7	19.1	9.8	10.1	100.0

Notes: <sup>1/</sup> Adjusted for regional price variation as in Glewwe, 1987.

Source: CILSS Survey estimates.

activities and from some form of self-employment. Of the households in the upper 20 percent of the welfare distribution, 50.8 percent depend entirely on wages, 16.6 percent receive both wages and earnings from self-employment activities, and 19.8 percent earn income from self-employment activities alone, but not exclusively farming (Table 11). Only 10.2 percent of households in the highest welfare quintile receive all earned income from

farming. In contrast, farm households are among the poorest in the country. Fifty nine percent of households in the bottom 40 percent of the welfare distribution are entirely dependent on agricultural earnings to secure a basic livelihood, and 27.4 percent are wholly dependent on non-farm or mixed farm and non-farm self-employment earnings. Less than 13 percent of households in the lower two quintiles receive income from activities outside the so-called family sector. Thus, the majority of the poor are dependent on incomes with a high transitory component; drought or inclement weather can cause a sharp drop in crop income, with concomitant second order effects throughout the economy, depending on linkages.

A brief comment is made here on the meaning of a "transitory" element in farm and business incomes. In a formal sense, the designations of "transitory" and "permanent" incomes were coined by the permanent income theorists headed by Friedman (1957), (see also Mayer, 1972, for a good overview of related theories and relevant empirical work), to differentiate between the behavioral response to long-run, stable components of income and more variable components. The marginal propensity to consume out of permanent income is hypothesized to be much greater (in the strictest sense of the theory, converging to one) than the marginal propensity to consume out of transitory income (likewise in the strictest sense converging to zero).

The use of "transitory" here encompasses a broader set of issues than strict adherence to theory would indicate; we assume that income from self-employment or family run enterprises typically has a consumption and an investment component. Farmers accrue farm profits and ultimately plow them

Table 11: Percentage Distribution of Households by Adjusted Per Capita Expenditure Quintile and Activity Classification in Côte d'Ivoire

	Wage Income Only (N=260)	Farm Income Only (N=618)	Non-Farm Self- Employment and Non-Farm Self- Employment Income (N=408)	Wage and Self- Employment Income (N=251)	No Earned Income (N=27)	Total (N=1564)
Quintile 1	1.3	64.3	24.8	8.9	0.6	100.0
Quintile 2	2.9	52.9	29.9	14.0	0.3	100.0
Quintile 3	9.9	42.7	28.3	17.5	1.6	100.0
Quintile 4	18.2	26.8	28.7	22.9	3.5	100.0
Quintile 5	50.8	10.2	19.8	16.6	2.6	100.0
Total Country	16.6	39.4	26.3	16.0	1.7	100.0

Sources: CILSS Survey estimates.

(in a figurative sense) back into the farm or other family businesses through capital and land purchases. One expects similar behavior on the part of small entrepreneurs -- the cash for investment capital must come from somewhere, and credit is difficult to obtain and costly in many LDCs. Thus, income from farm and non-farm self-employment may be less correlated with consumption than wage income for two reasons; (i) inherent income variability, which leads the household to save cash in times of plenty in anticipation of future shortfalls, and possibly to spend more than annual earnings alone might indicate in times of relative scarcity; and (ii) the role of self-employment profits in expanding investment capital and ensuring adequate levels of future liquidity.

Cumulative Shares of Income and Consumption Expenditures

Table 12 which shows the average household income and consumption expenditures by income and consumption deciles and the cumulative share in each decile, indicates that welfare is more evenly distributed in the Côte d'Ivoire than prior analyses would lead us to expect. Consider the first panel in the table, which shows adjusted average income and consumption by per capita income deciles. Clearly income is much more unevenly distributed than consumption expenditures, as intuition would suggest. The bottom 20 percent of the per capita income distribution receives some 3.6 percent of income and accounts for 9.6 percent of total consumption expenditures. Income and consumption shares become more equal towards the middle and upper end of the distribution - households in the wealthiest decile receive a third of all income and account for some 20 percent of private consumption. If households are ranked by per capita consumption deciles (the second panel in Table 12), we find a surprising degree of equality across the distributions; income is clearly more evenly distributed across expenditure deciles than income deciles. Households in the lower 20 percent of the welfare (consumption) distribution receive some 8.4 percent of total income and consume 7.7 percent of total private consumption. The lower 50 percent of the welfare distribution receive 29.2 percent of total income and account for 24.8 percent of total expenditures. Finally, the upper 10 percent of the welfare distribution receive 22.5 percent of total income and account for 21.9 percent of consumption expenditures in the country, significantly less than the 34.6 percent of income received by the highest income decile.

Table 12: Distribution of Adjusted Household Income and Consumption Expenditures in Côte d'Ivoire  
by Adjusted Per Capita Income and Expenditure Deciles <sup>1/</sup>

	Per Capita Income Deciles				Per Capita Expenditure Deciles			
	Average Annual Income (CFA)	Cumulative Share in Decile	Average Annual Consumptions Expenditures (CFA)	Cumulative Share in Decile	Average Annual Income (CFA)	Cumulative Share in Decile	Average Annual Consumption Expenditures (CFA)	Cumulative Share in Decile
Decile 1	150,054	1.0%	735,856	4.7%	557,849	3.5%	446,351	2.9
Decile 2	416,711	3.6	845,190	10.1	772,855	8.4	749,957	7.7
Decile 3	602,773	7.4	959,596	16.3	941,480	14.4	873,871	13.3
Decile 4	785,366	12.4	1,291,377	24.6	1,191,089	21.9	1,116,142	20.4
Decile 5	966,700	18.5	1,314,656	33.0	1,145,460	29.2	1,244,950	24.8
Decile 6	1,167,061	25.9	1,492,423	42.5	1,320,096	37.6	1,435,611	37.6
Decile 7	1,574,271	35.9	1,567,409	52.6	1,799,729	49.0	1,764,472	48.9
Decile 8	1,877,179	47.7	1,910,363	64.8	2,034,022	61.8	2,025,891	61.9
Decile 9	2,784,798	65.4	2,304,799	79.6	2,478,475	77.5	2,533,641	78.1
Decile 10	5,469,470	100.0	3,182,609	100.0	3,546,717	100.0	3,414,748	100.0
TOTAL	1,578,114	-	1,559,979	-	1,578,114	-	1,559,979	-

Notes: <sup>1/</sup> Decile 1 is the lowest, Decile 10 is the highest income/expenditure group.

Source: CILSS Survey estimates.

Interestingly, at least some households at the lower end of the expenditure distribution are substantial savers, which could be explained by: (i) basic thriftiness amongst the poor, and a tendency to save against possible future income shortfalls, which suggests that at least some households towards the bottom of the expenditure distribution are there in part through choice rather than pure economic necessity, and (ii) borrowing constraints, which particularly constrain the consumption behavior of the poor. Note also that households in the lowest income decile evidence substantial dissavings, as one might expect if income has a substantial transitory component.

Table 13 shows similar measures to those presented in Table 12, stratified by region and adjusted per capita income and expenditure quintiles. (Note that averages have not been adjusted for regional price differences in Table 13). In these tabulations, the degree of difference in average income for the highest and lowest deciles in Table 12 is to a large extent caused by urban/rural differences in income and consumption levels. For example, rural households in the highest expenditure quintile earn on average CFA 1,791,544 per household annually, while urban households in Abidjan's highest quintile earn on average CFA 4,821,251. This is a marked difference in earnings, and is roughly paralleled by expenditure disparities. While we are reluctant to make definitive statements on the absolute size of the welfare gap between urban and rural areas, the differences in the means are suggestive of substantial differences in urban and rural living standards. Simple comparisons of extremes suggest that while the disparity in income between the wealthiest and poorest groups is greater in Abidjan than in rural communities,

Table 13: Composition of Household Income and Consumption Expenditures in Côte d'Ivoire, by Region and Adjusted Per Capita Income and Expenditure Quintiles within each Region <sup>1/</sup>

	Adjusted Per Capita Income Quintile							
	Average Annual Income (CFA)	Cumulative Share Income	Average Annual Consumptions Expenditures (CFA)	Cumulative Share in Quintiles	Average Annual Income (CFA)	Cumulative Share Income	Average Annual Consumptions Expenditures (CFA)	Cumulative Share in Quintiles
<b>Abidjan</b>								
Quintile 1	637,310	4.5%	1,736,735	12.5%	1,320,606	9.3%	1,502,323	10.8%
Quintile 2	1,289,724	13.6	2,227,836	28.5	1,943,546	23.1	2,258,946	27.1
Quintile 3	1,726,047	25.8	2,218,763	44.5	2,354,059	39.7	2,559,170	45.5
Quintile 4	3,192,294	48.3	3,014,164	66.2	3,705,419	65.9	3,353,281	69.7
Quintile 5	7,337,055	100.0	4,693,577	100.0	4,821,251	100.0	4,210,141	100.0
<b>Other Urban Areas</b>								
Quintile 1	442,680	4.6%	1,162,508	12.0%	1,147,011	11.9%	1,005,003	10.4%
Quintile 2	1,093,576	15.9	1,578,699	28.3	1,454,764	26.9	1,510,521	25.9
Quintile 3	1,734,408	33.8	1,977,285	48.6	1,865,837	46.2	1,785,870	44.3
Quintile 4	2,562,219	60.3	2,333,991	72.7	2,415,151	71.1	2,383,647	68.9
Quintile 5	3,844,822	100.0	2,649,232	100.0	2,791,699	100.0	3,016,953	100.0
<b>Rural Areas</b>								
Quintile 1	215,169	4.2%	643,103	12.8%	517,634	10.1%	439,542	8.7%
Quintile 2	493,009	13.8	770,470	28.1	833,729	26.4	778,087	24.2
Quintile 3	751,110	28.5	969,810	47.3	920,168	44.4	924,173	42.5
Quintile 4	1,153,562	51.1	1,128,398	69.7	1,051,377	65.0	1,106,589	64.5
Quintile 5	2,503,879	100.0	1,527,391	100.0	1,791,544	100.0	1,791,115	100.0

Notes: <sup>1/</sup> Quintile 1 is the lowest, Quintile 5 is the highest income/expenditure group.

Source: CILSS Survey estimates.

the disparity in consumption expenditures or welfare is greater in rural areas. A simple count of the households reporting food budget shares greater than 80 percent (a standard poverty indicator) lends further support. In Abidjan, none of the households interviewed reported food budget shares greater than 80 percent of the total value of consumption, and in other urban areas, only 1.2 percent of households reported food budget shares greater than 80 percent. In contrast, over 14 percent of rural households spent more than 80 percent of total outlays on food.

The Gini coefficient is a commonly used measure of inequality in income and asset distribution studies. For this study, we used Sen's (1973) definition of the Gini coefficient, which is

$$\text{Gini} = \frac{n+1}{n} - \frac{2}{n^2 \mu} \sum_{i=1}^n (n+1-i)x_i$$

where  $n$  is the sample size,  $x$  is the variable of interest, and  $\mu$  is its estimated mean value. A coefficient of zero implies perfect equality while a measure of 1 implies perfect inequality.

As expected, the Gini coefficients for income are substantively higher than similar coefficients for consumption expenditures (Table 14). Further, the Gini coefficients for the whole country are typically higher (particularly in the case of consumption) than region-specific values. This high degree of between-region variation was also identified in Table 13; income (and consumption) may well be more unequal between regions than within regions. Note that the level of income inequality tends to be higher in Abidjan and in rural areas compared to other urban areas. Gini coefficients

estimated on per capita measures are similar to aggregate measures in Abidjan. However, in rural areas, per capita coefficients indicate a lesser degree of welfare and income equality, while in other urban areas coefficients indicate a greater degree of welfare and income inequality.

Table 14: Gini Coefficients for Household Income and Consumption Expenditures by Region and Total Country: Côte d'Ivoire

	Income-Gini		Expenditure-Gini	
	Total	Per Capita	Total	Per Capita
Abidjan	.536	.523	.354	.344
Other Urban Areas	.449	.511	.347	.410
Rural Areas	.525	.476	.379	.326
Total Country <sup>1/</sup>	.540	.545	.410	.433

Notes: <sup>1/</sup> Adjusted measures are used for country-wide estimates.

Source: CILSS Survey estimates.

#### IV. COMPOSITION AND DISTRIBUTION OF ASSETS

Household income represents returns to labor inputs and private capital. Capital is held in the form of physical assets, financial assets, and human capital endowments, which include education and specific skills (typically represented by work experience). Human capital may also include less tangible items such as access to certain kinds of employment, credit sources, or educational opportunities. Because of the importance of assets in determining income flows, this section describes the extent, composition, and distribution of (measurable) private assets for Ivorian households. The intangibles, while possibly of considerable importance, cannot be measured directly.

##### Composition of Household Assets

Physical assets are grouped into three major categories: (i) personal assets, which include all private capital not directly used in market activities, (ii) non-farm family enterprise assets, which include capital used in non-farm self-employment activities, and (iii) farm assets, which include all farm capital and land. Assets held in the form of human capital are discussed later in the section.

Personal Assets. Subsumed under this category are jewelry purchases over the past 12 months (admittedly, this is a flow rather than stock value; unfortunately, no measure of the gross value of jewelry owned is available in the CILSS); the present value<sup>5/</sup> of all durables owned by the household; the present value of automobiles owned; the estimated value of owned housing

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<sup>5/</sup> Survey respondents were asked how much they would receive for each durable item owned if they "were to sell it today."

owned housing stocks <sup>6/</sup>; and the household's net debt position (money loaned out minus money borrowed) and total cash savings. Country-wide, the value of personal assets held in 1985 was reported to be CFA 937,462; jewelry purchases accounted for 1 percent of the total; durables for 17 percent, automobiles for 16 percent, housing stock for a substantial 47 percent, debts for some -4 percent of the total (overall, households were net debtors); and savings for 23 percent. Not surprisingly, housing accounted for nearly half of the total personal assets held.

Non-farm Family Enterprise Assets. These include unsold inventories, buildings and land, business durables such as tools and equipment, and rental property. All values were reported in the questionnaire except rental properties. For these, only an annual flow measure was available (for example, income from property rented out). For purposes of imputing capital values to rental stocks, reported rents were assumed to represent a 25 percent annual return. The value is higher than that used for housing because (i) some of the rental capital may be owned for speculative purposes and yields high returns, and (ii) capital markets are imperfect and access is limited,

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<sup>6/</sup> Data limitations required that we use an indirect method to estimate the value of owned housing stock in Abidjan and other cities. The housing stock in rural areas was attributed a zero asset value primarily due to the lack of housing markets in these areas and even more severe data constraints. In urban areas, we first obtained an imputed annual rental value for the housing stock (see Annex I for details on how this was done), and from this, assuming that rents represent a 12 percent return on housing investments, imputed a capital value. Based on previous work (see citations in Annex I), the 12 percent figure is probably low for poor households (where rent-to-value ratios tend to be on a scale of 3-to-1 or 4-to-1 in many cities of the developing world) and high for wealthier households.

which means that capital can demand higher rents than under perfect market conditions.

In the survey estimates, households own on average CFA 761,827 in non-farm production capital: inventories account for 3 percent; buildings and land used in production for some 7 percent, tools, equipment, and machinery for 41 percent; and rental stocks for the remaining 47 percent. The last category could have been included above in personal assets; however, it seemed more appropriate to assume that rental stock is owned for directly productive purposes, that is, to generate income, rather than as a personal asset used in the day-to-day maintenance of household activities.

Farm Assets. These include land, stored crops <sup>7/</sup>, livestock, hand tools, and farm equipment. For the country as a whole, the average value of farm assets per household was CFA 3,580,567. Land accounted for the main portion; 95 percent of total farm assets are held in the form of land <sup>8/</sup>. The other categories account for roughly equal shares of the remainder, with livestock having the highest share (1.5 percent) and farm equipment the lowest (.7 percent).

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<sup>7/</sup> Crops in storage were measured in terms of the number of weeks they would feed the household. Value estimates were derived by multiplying the number of weeks by the cost of a week of consumption for the relevant food category as reported in the expenditure section of the questionnaire.

<sup>8/</sup> Land was valued according to the household's response to the question "how much could you sell your land for today?" All but a few of the farm households responded to this question. However, as nearly two-thirds of farm households claimed they could not sell their land due to family, social, or cultural constraints, one must wonder how land valuations were made. The maximum "permitted" land value was assumed to be CFA 9,375,000 per hectare. Only a few households reported per hectare land value greater than this, and were therefore set to the limiting value.

For the country as a whole in 1985, total physical and monetary household assets are valued at CFA 5,264,821 per household, of which personal assets comprise some 18 percent, non-farm business assets some 14 percent, and farm assets the remaining 68 percent. Average household income is CFA 1,600,000 per annum for the total country. Thus, households in the Côte d'Ivoire maintain a stock of assets that is nearly three and one-half times the annual income, primarily tied up in farm land (65 percent), rental capital (7 percent), and a dwelling unit (8 percent).

Clearly the distribution of asset holdings will vary by region in the Côte d'Ivoire, depending on the spatial orientation of productive activities. Table 15 shows composition of household assets by region and for the whole country. Averages are computed for total households within appropriate regional categories and for households in the lower 90 percent of the asset distribution; in effect, the wealthiest households (for total asset holdings) are dropped from averages in the second column.

According to survey estimates, households in Abidjan hold assets valued at an average of CFA 4,264,392 per household (for the total Abidjan sample) and CFA 2,428,005 per household for those in the lower 90 percent of the asset distribution; thus, the distribution of assets is highly skewed in the capital city. In the asset composition, some 40 percent of the total are personal assets, 8 percent agricultural assets, and the remaining 52 percent non-farm business assets. The share of non-farm business assets drops to 34 percent of the total for households in the lower 90 percent of the asset distribution; the wealthiest households own a significant amount of production capital.

Table 15: Composition of Household Assets by Region and Total Country: Côte d'Ivoire

Type of Asset	Abidjan		Other Urban		Rural		Total Country	
	Total	Lower 90%						
<b>Personal Assets (CFA)</b>								
Annual jewelry purchases	19,414	13,968	12,849	9,807	5,459	5,164	10,010	7,669
Total personal savings	312,164	123,684	342,964	331,418	125,449	115,521	211,551	161,004
Present value of durables	299,630	183,678	259,056	223,740	73,918	72,013	161,476	122,724
Present value of automobiles	425,428	187,186	164,548	108,815	49,666	37,715	154,365	78,670
Estimated value of housing stock	809,539	746,246	1,205,269	1,335,434	-	-	438,564	404,467
Net debt position	-163,370	-49,569	-64,992	6,674	17,792	23,375	-38,505	7,059
<b>Total</b>	<b>1,702,805</b>	<b>1,205,194</b>	<b>1,964,694</b>	<b>2,015,889</b>	<b>272,283</b>	<b>253,788</b>	<b>937,462</b>	<b>781,594</b>
<b>Non-Farm Family Enterprise Assets (CFA)</b>								
Unsold inventories	23,484	14,145	54,295	57,671	15,281	13,876	25,322	22,857
Value of buildings and land	30	40	26,434	18,380	85,630	77,050	54,799	51,454
Value of business durables	1,228,032	121,940	164,049	148,964	27,383	17,071	312,981	62,534
Value of rental property	1,064,751	691,192	528,410	290,202	57,965	38,145	372,880	205,131
<b>Total</b>	<b>2,301,631</b>	<b>827,318</b>	<b>773,188</b>	<b>515,207</b>	<b>185,990</b>	<b>146,142</b>	<b>761,827</b>	<b>341,975</b>
<b>Farm Assets (CFA)</b>								
Estimated value of land holdings	317,136	391,259	1,410,245	1,403,246	5,319,900	5,177,271	3,420,394	3,560,453
Value of stored crops	131	175	9,606	10,234	71,674	71,830	43,201	46,585
Value of large livestock	16,189	61	33,639	37,511	80,142	78,827	56,598	56,460
Value of tools	3,227	3,539	24,183	26,542	51,308	50,959	35,272	37,586
Value of farm equipment	1,240	458	5,635	6,360	41,191	35,766	25,101	23,519
<b>Total</b>	<b>337,923</b>	<b>395,493</b>	<b>1,483,308</b>	<b>1,483,892</b>	<b>5,564,216</b>	<b>5,414,652</b>	<b>3,580,567</b>	<b>3,724,603</b>
<b>Total Household Assets (CFA)</b>	<b>4,264,392</b>	<b>2,428,005</b>	<b>4,221,190</b>	<b>4,014,998</b>	<b>6,022,488</b>	<b>5,814,582</b>	<b>5,264,821</b>	<b>4,848,173</b>

Source: CILSS tabulations.

Households in other urban areas have assets valued at CFA 4,221,190, which is roughly on a par with per household stocks in Abidjan.

Interestingly, deleting households in the upper 10 percent of the asset distribution causes minimal change; the remaining households report holding assets valued at an average of CFA 4,014,998 per household, which suggests that assets are more evenly distributed in other urban areas than in Abidjan. Some 46 percent of total assets are held in the form of personal stocks, 18 percent in non-farm business assets, and the remaining 46 percent in farm capital, primarily land. These shares clearly reflect an increasing orientation towards agricultural activities in lieu of non-farm enterprises as we move from Abidjan to the small and medium-sized cities and towns.

Households in rural areas report the highest average assets in the country (CFA 6,022,488). Land is the main component, comprising some 88 percent of the total value. The remainder is split evenly between personal assets and non-farm business assets. Households in urban areas outside Abidjan, as also rural households, do not evidence high skewedness in the distribution of assets. We will return to questions of distribution.

There are several cross-regional differences worth noting in Table 15. Most notably, the ratio of asset values to average incomes is lowest in Abidjan (1.51) and clearly highest for rural households (5.69). This is not surprising given the regional dispersion of productive activities and the high degree of land intensiveness of agricultural activities. One must view the capital stock to flow ratio in rural areas with some caution. However, some two-thirds of rural households cannot sell any of their major stock -- land -- which makes it an exceedingly non-liquid asset. Also, there is little

evidence that land is used as collateral for obtaining credit. This may in part account for some of the high land prices observed in the survey; the scarcity of land offered for sale may artificially inflate market prices. However, rural households may tend to maintain a smaller stock of liquid assets than their urban counterparts. If we define liquid assets as (i) jewelry, (ii) cash savings, (iii) durables and automobiles, (iv) business inventories, and (v) stored crops, then households in Abidjan hold on average CFA 1,080,251 in liquid assets, households in other urban areas hold only CFA 843,318, and rural households hold CFA 341,447. These absolute values are somewhat misleading. The ratio of liquid assets to annual income in Abidjan is .38, in comparison to .43 in other urban areas and .33 for rural households. Thus, rural households have high overall asset holdings, but a considerable proportion of these are tied up in very non-liquid stocks. Interestingly, in rural areas, 46 percent of personal assets are in the form of cash savings, the most liquid form of assets, in comparison to only 18 percent in Abidjan and 17 percent in other urban areas.

It is often claimed that credit constraints seriously hamper growth in developing countries. Estimates of the average net debt position of Ivorian households lend some support to this view. For example, households in Abidjan are heavily indebted in comparison to their rural counterparts, particularly households in the upper 10 percent of the asset distribution, which indicates that access to credit may be important in building up capital stocks. Further, households in urban areas (including Abidjan) are more probably net debtors than net creditors, clearly obtaining at least some funds from outside the household sector. In comparison, rural households are net

creditors on average, which suggests that borrowing in rural areas is primarily within the household sector. From survey estimates, households in Abidjan report outstanding debts of CFA 412,712 in contrast to outstanding credits (money owed to them) of CFA 253,094 (they are net debtors); households in other urban areas report outstanding debts of CFA 222,400 and credits of CFA 109,772 (likewise net debtors); and rural households have net debts of CFA 37,067 in comparison to credits of CFA 55,237 -- they are in fact net creditors. (Note that this result may in part be caused by rural sampling biases which tended to oversample the wealthier households.) Some 90 percent of rural households who borrowed money in the past 12 months preceding the survey obtained loans from private individuals, in comparison to only 56 percent of borrowing households in Abidjan. The remainder borrowed from banks, government sources, or other financial institutions. The formal credit market is not extensive or well-developed in rural areas of Côte d'Ivoire.

To a great extent, regional classifications serve as proxies for classification by the structure of production. For example, households in rural areas have land assets because they are farmers, not because they live in rural areas per se. Table 16 shows average per household assets for the five categories of households defined by productive activities.

The figures in this table clarify what was implied by those in Table 15. Households which sell labor outside the household (that is, do not own the means of production) hold less physical assets overall, and what assets they do own are different than those owned by households who do not sell labor outside. From prior analyses, we know that wage-earning households receive higher incomes and primarily reside in Abidjan. They own substantial

Table 16: Composition of Household Assets by Income Source Category in Côte d'Ivoire

	1 Wage Income Only (N=260)	2 Farm Income Only (N=618)	3 Other Self-Employment Income Only (N=407)	4 Wage and Other Income (N=251)	5 No Earned Income (N=27)
<b>Personal Assets (CFA)</b>					
Annual jewelry purchases	22,141	4,718	9,282	12,365	3,417
Total personal savings	295,636	112,257	207,043	389,280	90,307
Durables and automobiles	789,044	96,732	302,709	411,203	85,704
Estimated value of housing stocks	423,328	115,372	625,962	896,583	900,044
Net debt position	-298,198	24,943	30,688	-43,566	13,981
Total	1,231,952	354,023	1,175,685	1,665,866	1,093,454
<b>Non-Farm Family Enterprise Assets (CFA)</b>					
Value of rental property	822,523	140,246	349,199	471,586	807,066
Business assets	-	-	1,435,320	120,753	-
Total	822,523	140,246	1,784,519	565,425	807,066
<b>Farm Assets (CFA)</b>					
Estimated value of land holdings	4,019	5,402,820	3,669,498	2,042,241	0,0
Other farm assets	160	251,361	172,660	90,924	684,6
Total	4,179	5,657,181	3,842,158	2,133,164	684,6
<b>Total Household Assets</b>	<b>2,058,655</b>	<b>6,151,451</b>	<b>6,802,361</b>	<b>4,267,638</b>	<b>1,901,205</b>

Source: CILSS tabulations.

rental properties, durables and automobiles, jewelry, and have higher debts than households in other categories. They also report extensive cash savings, typically in formal savings institutions. In contrast, households which receive earned income only from agricultural activities have most of their asset holdings tied up in land, and own very little else; they are an extreme version of the rural household profile in Table 15. They are net creditors, have some savings (although typically not in formal savings institutions), own some farm equipment and tools, and seldom rent property to others.

Households in the third category provide a contrast to "pure" farm households; they are, in combination with households in the fourth category, the Côte d'Ivoire's entrepreneurs or petty capitalists. All households which earn income from non-farm self-employment but do not receive wages are in this category (including those also receiving farm income). Their overall average assets are the highest among the categories; they own substantial amounts of land and substantial production capital for their business. Cash savings are also high in comparison to farm households, and housing investments are extensive within the group. To characterize households in this category simply, they report highly diversified asset portfolios. However, like households receiving only income from farm activities, they are net creditors rather than net debtors.

Households in the fourth category are among the wealthiest. These include households who receive both wage income and some form of income from self-employment. Interestingly, households in this category are net debtors, like those who receive only wage income. This suggests some connection between having a job outside the household (which means a steady source of

income) and borrowing, particularly borrowing from formal credit sources. Households in this category also have large cash savings and are heavily invested in housing stock and durables. Similar to other wage households, they own some rental stock and have both business and farm capital -- in short, a diversified asset portfolio allows them to obtain income from a number of sources.

Only 27 households in a sample of 1564 did not receive earned income. Although absolute numbers are too few for generalization, these households appear to own limited assets (with the exception of a dwelling unit and rental stocks), and primarily subsist on rental income and public and private transfer payments.

#### Distribution of Assets

Gini coefficients were computed for various categories of physical assets in the Côte d'Ivoire, and for "human assets", defined in terms of years of formal education completed. Two measures of the household-level stock of human capital are used; (i) aggregate years of education across all household members aged 20 to 60 years old, and (ii) years of education of the most educated person in the household in the same age group. The first measure treats education as an aggregate stock that is augmented by each year acquired by a household member. For example, a household with three persons each having 2 years of education would have the same aggregate measure as a similarly sized household with one member having six years of education and the other two members having none. The second measure treats education as a sort of household public good which has a particular use within the household production process; any one person can supply all required education inputs.

Further, the definition implicitly assumes that education is commensurate with managerial ability and does not augment labor inputs directly. The second measure is most appropriate in the analysis of self-producing households, while the first measure might work best in analyzing households who receive the bulk of their income from wage activities.

Past work has shown that a year of primary education typically yields a different return than a year of secondary or tertiary education, (for a general review, see Psacharopolous, 1985). Therefore, education was classified into three categories -- primary, secondary, and tertiary.<sup>9/</sup> The education variables are measured in terms of years of schooling completed in the relevant category.

Table 17 shows Gini coefficients for selected asset categories and education measures by region and country-wide totals. As suggested by averages in Table 15, physical assets are more highly concentrated in Abidjan than in other regions; the Gini coefficient for total assets (excluding land and education) is .820 in Abidjan, .615 in other urban areas, and .706 in rural areas. In contrast and, as expected, because of the greater availability of schools in urban areas, education tends to be less highly concentrated in Abidjan than other regions. The Gini coefficient for the single individual, maximum education variable is only .227 for primary schooling in Abidjan as compared to .715 for rural households, and .515 for

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<sup>9/</sup> The Ivorian education system is similar to the French system. The first 7 years of schooling are considered primary (JE, CP1, CP2, CE1, CE2, CM1, CM2), the next 7 secondary (6E, 5E, 4E, 3E, 2E, 1RE, TER), and the last 8 tertiary (U1, U2, U3, U4, U5, U6, U7, U8).

Table 17: Gini Coefficients for Selected Household Assets by Region in Côte d'Ivoire

Type of Asset	Abidjan	Other Urban	Rural	Total Country
<u>Personal Assets</u>				
Total savings	.852	.812	.839	.850
Value of durables and automobiles	.752	.666	.798	.800
Value of housing	.894	.709	-	-
<u>Non-Farm Family Enterprise Assets</u>				
Value of rental property	.918	.939	.981	.963
Value of other business assets	.988	.938	.988	.987
<u>Farm Assets</u>				
Total land used	.975	.816	.467	.651
Value of other agricultural assets	.992	.844	.607	.745
<u>Education</u>				
Total years of household members				
- primary	.458	.531	.686	.621
- secondary	.609	.679	.917	.812
- tertiary	.901	.959	-	.972
Most educated person, 20-60 years old				
- primary	.227	.387	.715	.543
- secondary	.515	.661	.927	.785
- tertiary	.890	.959	-	.968
<u>Total assets, Excluding Land and Education</u>				
	.820	.615	.706	.793

Source: CILSS tabulations.

secondary education in Abidjan as compared to .927 for rural households. The difference in the distribution of physical and human assets in part reflects the higher dependence on wage income in urban areas; many urban households sell labor and skills rather than goods they produce. Returns to education are typically found to be highest in the urban wage sector, and lowest in rural agriculture, although there is still much debate on this subject. Household level production functions described elsewhere (see Kozel, 1987) show significantly higher returns

to education for wage households than for farm households. However, rural and urban entrepreneurs also evidenced quite substantial returns to investments in education.

The concentration of land holdings (measured in hectares per household) is low in rural areas in the Côte d'Ivoire in comparison to other LDCs. We calculated a Gini coefficient of .467 for rural land, and .607 for other agricultural assets in rural areas. Typical Gini coefficients for land distribution range from a low of .35 or .4 in some Southeast Asian countries to a high of .8 in parts of Latin America.

Other Gini coefficients indicate a high degree of concentration of non-farm family enterprise assets and of most personal assets. The distribution of durables is less highly skewed than some other assets, but an average Gini coefficient around .75 (by region) does not indicate a notably even distribution of resources.

To summarize the findings in this section: physical assets tend to be highly concentrated in the Côte d'Ivoire, with the possible exception of rural land holdings and other farm capital. In contrast, stocks of human capital (measured in terms of education) are less concentrated, especially in primary schooling in urban areas. However, the distribution of education is uneven in rural areas for secondary and tertiary education. For instance, none of the 900 household sample of rural households reported a member over 20 years old having any tertiary education. Note that education is concentrated in urban areas outside Abidjan, but not nearly to the degree evidenced in the countryside.

## V. SUMMARY AND CONCLUSIONS

Households that obtain income from wage activities are typically among the wealthiest in the Côte d'Ivoire, with the exception of a few very successful urban entrepreneurs. In contrast, farm households, particularly those with no source of off-farm income, are among the poorest. As most of the wage employment is in the cities, there is a significant urban/rural income difference in the Côte d'Ivoire. The difference is surprising given the export-crop lead growth strategy pursued by Ivorian policy-makers since independence, and the pervasiveness of coffee and cocoa cultivation in rural areas (nearly two-thirds of farmers grow either or both crops). Households with diversified labor portfolios are generally better off than households that depend on a single source of income (particularly when tied to self-employment activities) to satisfy consumption needs.

As expected, consumption expenditures are more evenly distributed than income in the Côte d'Ivoire. Stocks of assets are more unevenly distributed than either income or consumption, with the exception of primary and secondary schooling in urban areas (particularly Abidjan), and rural land holdings. Neither of these results is surprising. Extensive efforts have been made in recent years to increase school enrollment via massive public subsidy programs, and land surpluses still exist in many parts of the country. In contrast to land and "low level" human capital, non-farm production capital is concentrated in the hands of a few urban entrepreneurs.

The findings presented in the paper provide useful information about the link between poverty and productive activities in the Côte d'Ivoire. Poverty is a rural phenomenon and an urban phenomenon. In rural areas, the

poorest households depend primarily on subsistence farming and receive little off-farm income. They are more likely to live in the Savannah region (as opposed to the East Forest or West Forest), which has a lower level of public infrastructure than other regions. Unlike many other developing countries, landlessness and poverty do not seem highly correlated in the Côte d'Ivoire: land is surprisingly evenly distributed among rural households. Efforts to improve the living standards of the rural poor should focus on ways to increase basic services, to expand opportunities for off-farm employment, possibly to improve access to credit, and to increase the export orientation of agricultural activities.

In contrast, the urban poor tend to derive the main part of their income from marginal informal sector activities (for example, petty trading and food sales) and low paid wage jobs in the private sector. The only asset which is equitably distributed in urban areas is primary education; physical capital tends to be highly concentrated in the hands of a few households. Interestingly, some 54 percent of households that live in urban areas outside Abidjan do not own the unit in which they reside, while 77 percent of households living in Abidjan are renters, more evidence of the concentration of wealth (as typified by housing units) in the Côte d'Ivoire. Income-oriented poverty alleviation strategies might include policies to: increase school enrollment for children from poor households (at secondary and tertiary levels); expand urban infrastructure; increase productivity in the informal sector; improve access to higher paid jobs in the public sector, and release potential capital constraints by increasing access to sources of credit for small entrepreneurs.

**ANNEX I**  
**Imputed Rents for Urban Households**

In line with previous work (see, for example, Lee and Trost, 1978, Maddala, 1984) selectivity corrected (Heckman, 1979) hedonic rent equations were estimated to impute rental values for owner-occupied housing. The approach is conceptually simple; households who own their dwelling unit receive an annual flow of services from the unit equal to what they would have had to pay to rent it -- in short, homeowners are treated as if they rent their dwelling unit from themselves.

Rent imputations were made for homeowners in urban areas (Abidjan and other urban) only. Rural households were excluded primarily for lack of data; some 97 percent of rural households reside in units they own, and information on rural rental markets is too limited to allow any assessment of rent-to-value ratios in these areas. Further, many rural households are not permitted (due to family, ethnic, or other cultural sanctions) to sell land or buildings. The exclusion of rural households from rental assessments does not mean that rural households receive no housing service flows from owned dwelling units, but rather that we lack sufficient information to estimate these service flows with any degree of accuracy. In any case, exclusion of rural households from rent imputations will not affect savings estimates as rent imputations enter both income and consumption valuations.

Some 46 percent of households in urban areas outside Abidjan reside in a dwelling unit they own, in comparison to only 23 percent in Abidjan. On the assumption that regionally diverse housing markets may operate along different lines, separate hedonic equations are estimated for (i) Abidjan and

(ii) other urban areas in aggregate. While it is preferable to further disaggregate other urban estimates, sample size limitations made this impractical.

This Annex includes a brief description of (i) the underlying sample selectivity model (knowledge of standard hedonic rent equations is assumed), (ii) estimates for Abidjan and other urban areas of a probit indicator function to predict probabilities of renting and owning, and (iii) selectivity-corrected hedonic rent estimates for each group of households.

#### Derivation of the Basic Model

We only observe rental payments for households presently in the rental market; the CILSS data does not include a measure of estimated rent for homeowners, or the present market value of the dwelling unit. We will use the actual rents paid by renters to impute rents for households who own their dwelling units.

Therefore, we first estimate an hedonic rent function which relates rents paid to characteristics of the housing unit and the neighborhood for all renters. In general terms, the hedonic function can be represented as

$$R = f(Z_1, \dots, Z_n | \text{household is a renter}) \quad (A1.1)$$

where: R is the market rent, and

$Z_1, \dots, Z_n$  are characteristics of the neighborhood or housing structure.

In the end what we want is the expected rental value of owner-occupied dwelling units, that is,

$$E[R|(Z_1, \dots, Z_n), \text{household is an owner}].$$

We obtain this measure as follows. Assume all households are either renters or owners (squatters are ignored for the present). Define an indicator variable,  $\delta$ , which takes on a value of one if the household rents its dwelling unit and 0 otherwise. If we assume that rents are some linear function of housing and neighborhood characteristics, then

$$R = \begin{cases} \text{unknown, if } \delta = 0 \\ \beta Z + \varepsilon_1 \text{ if } \delta = 1 \end{cases} \quad (\text{A1.2})$$

We specify a function to predict whether a household rents or owns its dwelling unit. The function includes the household characteristics and the household members on the right-hand side, and the indicator variable,  $\delta$ , on the left-hand side. It is likewise assumed to be linear in parameters.

$$\delta = \alpha X + \varepsilon_2 \quad (\text{A1.3})$$

where:  $\delta$  is a 0,1 indicator variable, and  
 $X$  is a vector of independent variables describing household and individual characteristics.

We want to obtain an unbiased estimate of rents from equation (A1.2). We cannot simply estimate (A1.2) for renters and use the coefficients

to impute rents for owners due to classic selectivity problems. Heckman (1979) has shown that an unbiased estimate of rents for the total population can be obtained using the following approach.

As before,

$$R = \beta Z + \varepsilon_1 \quad \text{given that } E[\varepsilon_1] = 0, E[\varepsilon_1^2] = \sigma_{11}$$

$$\delta = \alpha X + \varepsilon_2 \quad \text{given that } E[\varepsilon_2] = 0, E[\varepsilon_2^2] = \sigma_{22} = 1$$

$f(\varepsilon_1, \varepsilon_2)$  is bivariate normal,

$F(\varepsilon_1, \varepsilon_2)$  is the corresponding cumulative density function,

$$E[\varepsilon_1, \varepsilon_2] = \sigma_{12}.$$

R is observed iff  $\varepsilon_2 > -\alpha X$ ,

R is not observed if  $\varepsilon_2 < -\alpha X$ .

We know that the expected value of rents (based on Van der Gaag, 1984) for the total population is:

$$E[R|Z] = \beta Z \quad (\text{A1.4})$$

However, the expected value of rents for households in the rental market (that is, where the household is a renter rather than owner) is

$$E[R|Z, \varepsilon_2 > -\alpha X] = \beta Z + \gamma(\lambda_1) \quad (\text{A1.5})$$

where  $\lambda_1$  (typically called the Mills-ratio correction

factor) is defined as

$$\lambda_1 = \frac{f(-\beta Z)}{1-F(-\beta Z)} \quad (A1.6)$$

$$\gamma = \frac{\sigma_{12}}{\sigma_{22}} \quad (A1.7)$$

and  $f(\cdot)$  and  $F(\cdot)$  are the normal density and cumulative functions, respectively.

Recall that we want to estimate the expected value of rents conditioned on the household being a homeowner, that is, the expected rental value of an owned dwelling unit. Given the above derivation, this is equivalent to

$$E[R|Z, \epsilon_2 < -\alpha X] . \quad (A1.8)$$

We know that

$$E[R|Z] = E[R|Z, \epsilon_2 > -\alpha X] * E[\epsilon_2 > -\alpha X] + E[R|Z, \epsilon_2 < -\alpha X] * E[\epsilon_2 < -\alpha X] \quad (A1.9)$$

From this it follows that

$$E[R|Z, \epsilon_2 < -\alpha X] = \beta Z + \gamma(\lambda_2) \quad (A1.10)$$

$$\text{where } \lambda_2 = \frac{-f(-\alpha X)}{F(-\alpha X)} \quad (A1.11)$$

With equation (A1.10) we can compute the expected value of rent, conditioned not only on housing and neighborhood characteristics for homeowners, but also on the likelihood of ownership. The measure of imputed rent used in this study is: the expected rent for the sample of owners rather than the full sample (as is more typically done in income and consumption assessments).

The model is estimated in two steps following Maddala (1984). First, estimates of  $-\alpha X$  are obtained from a binary probit model using  $\delta$  (the decision to own or rent) as the dependent variable. Second, results are then used to estimate  $\lambda_1$ , which is one of the exogenous variables in the hedonic rent equation.  $\lambda_2$  is likewise estimated from the probit equation, and is used with the  $\beta$ 's from the hedonic rent equation(s) to impute rents for homeowners, that is,

$$\text{Imputed Rent} = \hat{\beta}Z + \hat{\gamma}(\hat{\lambda}_2)$$

The next section describes the specification of and empirical results from the binary owner/renter probit equation and hedonic rent functions for CILSS sample households.

### Empirical Results

The owner/renter probit model includes a wide array of variables specific to the household. Among these are: (i) employment variables; (ii) measures of housing subsidies; (iii) measures of assets and income; (iv) demographic variables; (v) length of time in present location; and (vi) specific characteristics of the household head. Table I-1A shows means and

standard deviations of these variables for households in Abidjan and in other urban areas. According to this table, some 11 percent of households in Abidjan and 12 percent in other urban areas receive some form of wage-related housing subsidy. Only 4 percent of dwelling units are used for business purposes in Abidjan as opposed to 11 percent in other urban areas. Also, households in Abidjan have lived in the city (although not necessarily in the same dwelling unit) for an average of 17.63 years, while households in other urban areas have lived in the same place for an average of 13.14 years. Note also that 30 percent of households in Abidjan are not native to the country, as compared to 20 percent in other urban areas. This suggests that there is a significant proportion of non-indigenous people in the Côte d'Ivoire. Households are large in each area; in Abidjan, households have on average 7.37 members, while in other urban areas they have 8.85 members.

The hedonic rent equations only include variables that relate to the housing unit or neighborhood. These are (i) descriptions of the physical structure; (ii) availability of public services; and (iii) size of the unit. Table I-1B shows means and standard deviations for exogenous variables included in the hedonic rent equations. From this table, we see that dwelling units in urban areas outside Abidjan are substantially larger than those in Abidjan -- units in Abidjan are on average 54.95 square meters, as compared to 81.37 square meters in other urban areas. Note also that units in Abidjan are far less likely to be occupied by single families, but generally have higher levels of public services (water and sanitation).

Table I-1A: Means and Standard Deviations of Independent Variables:  
Indicator Function For Tenure Choice

	Abidjan		Other Urban Areas	
	Mean	Standard Deviation	Mean	Standard Deviation
Employee in household?	.74	-	.58	-
Public employee in household?	.30	-	.31	-
Does household receive housing subsidies?	.11	-	.12	-
Value of subsidies per month (CFA)	5,987	20,796	6,012	18,549
Is dwelling unit used for business?	.04	-	.11	-
Measures of assets and income				
- total expenditures <sup>1/</sup> (CFA/yr)	2,513,928	1,721,709	1,684,050	1,162,245
- present value of business assets (CFA)	664,660	4,378,490	276,114	1,211,956
- income from durables (CFA/yr)	40,897	89,584	33,464	36,382
- value of outstanding debts (CFA)	441,394	2,437,225	219,582	1,228,481
- present value of cash savings (CFA)	322,285	1,085,908	342,494	1,607,442
Years household lived in current place	17.63	11.73	13.14	13.89
Household size	7.37	4.54	8.85	5.79
Characteristics of the household head				
- female?	.12	-	.11	-
- not Ivorian?	.30	-	.20	-
- age	42.12	11.32	44.81	13.62
- years of education	5.95	5.99	4.29	5.23

Notes: <sup>1/</sup> Excludes imputed rents and durables.

Source: CILSS tabulations.

Table I-2 shows parameter estimates of probit owner/renter indicator functions for households in Abidjan and other urban areas. In general, the results are encouraging and reveal some interesting facets of Ivorian housing

markets. For households in Abidjan, the probability of renting increases when total expenditures, housing subsidies, and education increase, and decreases when durable flows, outstanding debt, and length of residence increase. Interaction effects (total expenditures with employment status, age, and education of the household head) were generally not significant, with the exception of age\*expenditures, which has a negative (and significant) sign. Combining the two expenditure variables (total expenditures, age\*total expenditures) tells us that the probability of renting increases as income rises, but at equal levels of income "older" households are more likely to own their dwelling unit more often than households with younger heads.

The models for other urban areas are in general similar to those for Abidjan, but with one or two notable exceptions. For instance, households with at least one public employee are more likely to rent a dwelling unit than those without a public employee. Also, large households are less likely to be renters than smaller households, as are female-headed households, and households with older heads. Not surprisingly, non-Ivorian households are significantly more likely to rent a dwelling unit than indigenous households. At least some of the results found in urban areas outside Abidjan reflect the stronger rural orientation of these households -- other "urban" areas range from medium-sized cities to villages.

(Note that specifications are not identical between the two areas due to estimation problems with the second step of model estimation -- the hedonic rent functions. Some full(er) specifications caused problems in the estimated ratio of error variances between the two equations in the model.)

Table I-1B: Means and Standard Deviations of Independent Variables: Hedonic Rent Equation

	Abidjan		Other Urban Areas	
	Mean	Standard Deviation	Mean	Standard Deviation
Area (meters <sup>2</sup> )	54.95	57.53	81.37	67.31
Dwelling unit characteristics				
- walls of permanent materials?	.96	-	.80	-
- electric lighting?	.81	-	.75	-
- fuel supply gas or electricity?	.29	-	.13	-
- indoor water faucet?	.44	-	.21	-
- flush toilet?	.80	-	.24	-
- inside toilet facilities?	.45	-	.25	-
Structural characteristics				
- detached, single family home	.09	-	.28	-
- compound, single family occupied	.07	-	.34	-
Rent (CFA/month)	25,961	36,771	22,408	22,215

Source: CILSS tabulations.

Table I-3 shows hedonic rent estimates for households in Abidjan and other urban areas. The variable on the left-hand side is cash plus in-kind rental payments measured in CFA per month. A standard linear model is estimated for each subsample. Also, a semi-log model -- the natural log of monthly rent is used as the dependent variable -- is estimated for Abidjan. This latter model was used to make rent imputations for households in Abidjan.

Comparisons can be made between the rent equations for Abidjan's households and for households residing in other urban areas, although the models are not symmetric so far as variable inclusion is concerned. Note that both models include a measure of the total area of the housing unit (and area squared, to control for non-linearities), structural characteristics

Table 1-2: Indicator Functions for Choice of Housing Tenure, Renters Versus Owners  
(all coefficients estimated with respect to the rent alternative)

	Abidjan <sup>1/</sup>		Other Urban Areas	
Employees in household?	-.286	(0.75)	.332	(1.30)
Public employees in household?	-	-	.968	(3.29)
Does household receive housing subsidies?	1.259	(1.76)		
Value of subsidies per month (CFA)	-.000011	(1.38)		
Is dwelling unit used for business?	.411	(0.75)	-.205	(0.07)
Measures of assets and income				
- total expenditures (000 CFA/yr)	.000468	(1.79)	.00116	(2.26)
- present value of business assets (000 CFA)	-.0000357	(0.79)	-	
- income from durables (000 CFA/yr)	-.00395	(1.37)	.0025	(0.50)
- value of outstanding debts (000 CFA/yr)	-.0000346	(0.64)	-	
- present value of cash savings (000 CFA)	.0000249	(0.23)	-	
Years household lived in current place	-.012	(1.49)	-.013	(1.21)
Household size	-		-.150	(4.91)
Characteristics of the household head				
- female?	-		-.328	(1.09)
- age	-		-.033	(1.86)
- not Ivorian?	-		1.198	(4.32)
- years of education	.031	(1.31)	-.556	(0.52)
Interaction variables				
- Employees * total expenditure (000 CFA)	.000129	(0.75)	-	
- Age of head * total expenditures (000 CFA)	-.0000154	(3.88)	-.0000173	(1.6)
- Age of head * education of head	-		.0017	(0.64)
Intercept	1.389	(3.77)	1.482	(1.85)
<u>Model statistics</u>				
Log-likelihood value				
- at zero	-172.3		-209.3	
- at convergence	-136.5		-103.4	
$\chi^2$ statistic	71.73		211.96	
Percent renters	76.0%		50.3%	
Number of cases	313		302	

Notes: <sup>1/</sup> Asymptotic t-statistics are in parentheses. Source: CILSS tabulations.

(single family versus non-single family units), some dwelling unit characteristics (materials used in the walls, source of fuel supplies), and "cluster"-specific dummy variables. Models differ in terms of dwelling characteristics -- for Abidjan, a source of lighting dummy is included, while dummy variables relating to water and sanitation were found significant for other urban areas.

Table I-3 shows households in Abidjan are willing to pay an average of CFA 309.7 per square-meter per month, in comparison to CFA 337.2 per square-meter per month for urban households outside Abidjan. Note that rents per unit area fall gradually with increasing size of the dwelling unit in other urban areas, but tend to rise with increasing size in Abidjan. Note also that the area-based variables evidence stronger effects in the log-linear model, which suggests that there are substantial non-linearities in the relationship between rents and the size of dwelling units.

In Abidjan, households are willing to pay CFA 12,863 per month to obtain walls made of permanent materials (cement, brick, stone, wood, iron), CFA 588.7 per month for electricity, and CFA 19,067 to reside in a unit with gas or electric cooking facilities. In comparison, households in other urban areas are willing to pay only CFA 861.2 per month for walls made of permanent materials, CFA 12,949 for gas or electric cooking facilities, CFA 3,384 for an indoor water faucet, CFA 7,177 for a flush toilet, and CFA 6,955 for inside toilet facilities.

Also, households were willing to pay an extra CFA 10,237 per month to live in a single family detached home in Abidjan, and CFA 49,712 to live in a single family compound. In contrast, households in other urban areas were

Table 1-3: Hedonic Rent Equations Corrected for Sample Selectivity

	Abidjan <sup>1/ 2/</sup>		Rent		Other Urban Areas <sup>3/</sup>	
	Log (rent)					
Area (meters <sup>2</sup> )	.023	(7.93)	309.7	(2.9)	337.2	(8.93)
Area-squared	-.000049	(3.08)	.843	(1.5)	-.392	(7.37)
<b>Dwelling unit characteristics</b>						
- walls of permanent materials?	.416	(2.28)	12,863	(1.9)	861.3	(0.30)
- electric lighting?	.177	(1.79)	588.7	(1.2)	-	
- fuel supply gas or electricity?	.552	(5.67)	19,067	(5.4)	12,949.0	(4.61)
- indoor water faucet?	-		-		3,384.1	(1.22)
- flush toilet?	-		-		7,177.2	(1.87)
- inside toilet facilities?	-		-		6,954.7	(2.10)
<b>Structural characteristics</b>						
- detached single-family home	-.154	(0.94)	10,237	(1.7)	-7,541.0	(3.27)
- compound, single family occupied	.755	(2.53)	49,712	(4.6)	-2,721.5	(1.08)
<b>Community intercepts: Abidjan</b>						
- Bietry	.593	(2.43)	59,226	(6.5)	-	
- Autre Abobo	.282	(1.40)	13,499	(1.8)	-	
<b>Community intercepts: other urban areas</b>						
- Agnibilekrou	-		-		2,790.5	(0.61)
- Man	-		-		-2,231.2	(0.55)
- Bouake Air Force	-		-		8,565.5	(1.94)
Intercept	7,988	(38.92)	-17,465	(2.4)	-1,846.9	(0.57)
Lambda	.176	(1.05)	13,309	(2.2)	5,270.0	(2.40)
<b>Model statistics</b>						
R <sup>2</sup>	.645		.696		.782	
F-statistic	41.43		51.9		38.16	
Number of cases	238		238		152	
Mean of dependent variable	9.636		25,961		22,408	

**Notes:** <sup>1/</sup> Dependent variable is the natural logarithm of monthly rent (cash + in-kind) and monthly rent (cash + in-kind).

<sup>2/</sup> Asymptotic t-statistics are in parentheses.

<sup>3/</sup> Dependent variable is monthly rent (cash + in-kind).

**Source:** CILSS tabulations.

actually willing to pay less for single family units than multi-family units. However, the signs and magnitude of the parameters must be interpreted in the light of other variables included in the model -- we are, in effect, controlling for different factors in each of the regionally-based models, and these differences may affect the scale and direction of all coefficients.

The coefficient for the Mills-ratio correction factor is positive and significant in the linear models for both Abidjan and other urban areas, although not significant in the log-linear model. This means that there is significant correlation between the error term in the probit equation and the error term in the hedonic rent equation (recall that  $\gamma$ , the correction coefficient, is equal to  $\sigma_{12}/\sigma_{22}^{1/2}$  from (A1.7)); in short, sample selectivity appears to cause problems in imputing rents to homeowners in the Côte d'Ivoire, and should therefore take account of (for example, as we have done here) the imputation procedure.

The explanatory power of the model in both regions is good -- for Abidjan, the estimated  $R^2$  is .645 and .696 (semi-log and linear, respectively), while for other urban areas the  $R^2$  is .782 (linear only).

ANNEX II  
Annualized Value of Durables

In the CILSS, households were asked to identify the durables they own, when each was purchased, for what price, and the current value of each durable at the time of the survey. This information was used to impute an annualized flow of services obtained from the stock of durables owned by the household. This Annex briefly describes the stock of durables owned by Ivorian households, and how durable flow imputations were made.

Table II-1 shows ownership by region for thirteen durable stocks. According to these tabulations, urban households, whether in Abidjan or outside, they are much more likely to own almost any kind of durable good than rural households. Bicycles form the one exception to this rule; some 44.5 percent of rural households report owning a bicycle at the time of the survey, as compared to only 22.6 percent of households living in cities outside Abidjan and 3.6 percent of households in Abidjan.

Table II-1 also shows that the most frequently owned household durable is a radio/cassette player -- some 45.8 percent of households in the Côte d'Ivoire report owning at least one. Sixty eight percent of households in Abidjan own a television set, 57.8 percent of households in other urban areas, and 8 percent of rural households, for a national total of 30.7 percent. About half of the urban households also reported owning a fan and a refrigerator; country-wide totals are 22.9 and 24.3 percent, respectively (ownership is rare in rural areas). Sewing machines are fairly common throughout the Côte d'Ivoire; ownership levels are 33.2 percent, 36.4 percent, and 12.7 percent in Abidjan, other urban areas, and rural areas,

Table II-1: Percentage of Households Owning Durables,  
By Durable Category and Region

Durable	Abidjan	Other		Total
		Urban Areas	Rural Areas	
Sewing machine	33.2	36.4	12.7	21.9
Gas stove	37.7	23.8	2.0	14.0
Refrigerator	53.6	50.0	4.7	24.3
Air conditioner	19.2	11.1	0.0	6.4
Fan	49.7	49.4	3.7	22.9
Radio	30.8	28.0	19.6	23.5
Radio/cassette player	55.7	64.2	36.4	45.8
Phonograph	6.3	6.6	3.2	4.5
Stereo equipment	20.9	13.9	0.5	7.6
Television set	68.0	57.8	8.0	30.9
Bicycle	3.6	22.6	44.5	30.7
Mobylette	1.5	21.4	18.5	15.3
Car or truck	22.2	14.8	2.2	9.0

Source: CILSS tabulations.

respectively. Note that only 22.2 percent of households in Abidjan own an automobile or truck, as compared to 14.8 percent in other urban areas and 2.2 percent in rural areas. These levels of automobile ownership are typical for sub-Saharan African countries.

Table II-2 shows an average estimated annual rate of depreciation for each class of durables included in the CILSS questionnaire. These typically range from around 9 percent (sewing machines and bicycles) to a high of 17

percent (fans, radios, air conditioners). The measure is derived as follows: Consider the relationship between the value of a commodity purchased at some time  $t_0$  for price  $p_0$  and the value today, represented by market price  $p_t$ . If the durable good was purchased  $t$  years ago,

$$p_t = p_0(1-\delta)^t \quad (\text{A2.1})$$

where:  $\delta$  is the rate of depreciation, and all other variables are as previously defined.

Solving for  $\delta$ , equation (A2.1) becomes:

$$\delta = 1 - e^{((\log_e p_t - \log_e p_0)/t)} \quad (\text{A2.2})$$

Note that both the purchase price ( $p_0$ ) and the estimated price at the time of the interviews ( $p_t$ ) is needed to estimate an average rate of depreciation for some particular commodity. Roughly 3 percent of households in the CILSS did not report either or both measures, and were excluded in estimating average depreciation rates (although these households were not excluded from service flow imputations). Also, households obtaining durables by way of non-market mechanisms (for instance, as gifts) were likewise excluded in estimating depreciation rates. These households were identified by a self-reported zero price at the time of purchase.

Table II-2: Estimated Depreciation Rates by Type of Durable

Durable	Depreciation Rate
Sewing Machine	.091
Gas stove	.153
Refrigerator	.132
Air conditioner	.173
Fan	.167
Radio	.161
Radio/cassette player	.146
Phonograph	.142
Stereo equipment	.122
Television set	.122
Bicycle	.092
Mobylette	.125
Car or truck	.117

Source: CILSS tabulations.

Following Diewert (1974), and Deaton (1980), the annual flow of services from a particular durable is defined as

$$V = P_t - P_{t+1} \frac{(1-\delta)}{(1+r)} \quad (A2.3)$$

where:  $r$  is the real interest rate or opportunity cost of capital,  
 $V$  is the annualized flow of services from durable stocks,  
 $p_{t+1}$  is the price of the durable at the beginning of next year (that is, at the end of this year),  
and all other variables are as previously defined.

For simplicity, we assume that all price changes ( $p_t - p_{t+1}$ ) are caused by stock depreciation. By implication, then,

$$V = p_t \left( 1 - \frac{(1-\delta)}{(1+r)} \right)$$

or,

$$V = p_t \frac{(r+\delta)}{(1+r)} \quad (\text{A2.4})$$

In short, the annualized flow of services from durable stocks is equal to the opportunity cost of capital plus the rate of depreciation times the current value of the stocks (or price today), all divided by one plus the opportunity cost of capital.

The main problem in measuring the annual flow of services from durables is that we do not know the opportunity cost of capital. Interest rates vary across households in LDC's, with this variation being a function of economic conditions and how well various commodity markets operate. Published market rates may bear little relationship to actual rates. For this study, we simply assumed a zero opportunity cost of capital in computing annualized durable flows. While this is a far from ideal solution, it seems the most practical given the objectives of the research, that is, analyzing private savings behavior in the Côte d'Ivoire. Recall that durable flows enter both

income and consumption estimates, and are netted out in assessing residual savings rates. Thus for most of the work described here, interest rate assumptions are irrelevant.

However, how much impact will the assumption of zero interest rates have on the welfare evaluations presented in the paper? This depends on the values of the interest rates and depreciation rates, that is, on the specific household and the type of commodity under consideration. For example, if the depreciation rate is .08 (roughly the lowest found among the CILSS durable types) and the interest rate is .10, then annualized double, depending on interest rate assumptions. However, in an absolute sense, the differences are not so large, as durable flows constitute only a small proportion of total income, so that even a doubling of the estimated values will have little impact on overall welfare. For this reason, and, given the objectives of the research, the admittedly ad hoc assumption of a zero opportunity cost of capital in estimating the annualized flow of services from durables is deemed acceptable.



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