

DISTRIBUTION OF LABOR INCOMES IN URBAN ZAIRE

BY JAMES L. MCCABE*

Economic Growth Center, Yale University

The author addresses himself first to the problem that summary measures of wage income inequality, computed for Kinshasa, the main urban area in Zaire, tend to overstate the degree of total labor income inequality among sharing units of comparable size. It is argued that this is true for two main reasons: (1) earnings from female commercial activity are not recorded in the available statistics; and (2) the 1960 UN definition of household upon which the measures of inequality are based understates the size of the actual sharing unit. Data taken from the 1967 Socio-Demographic Survey of Kinshasa and the 1970 household budget study are used to test these hypotheses regarding short-run income inequality.

The policy observation is made that, while modernization of the commodity distribution system may provide a disincentive for sharing and a reduction in opportunities for female employment, investment in non-service sectors may equalize the secular income distribution for a given migration cohort. Evidence of unskilled migrants moving from service to non-service sector employment in response to increased labor demand is presented. This is accomplished by supplementing sample survey data with time series on aggregate employment by sector for Kinshasa.

The consensus is that the unemployment problem in Zaire, like that in many African countries, is essentially urban. There is evidence of a labor shortage in agriculture where most of the tasks are performed by women[7]. Unlike many less developed countries (LDCs), where the unemployment problem mainly takes the form of underemployment, Zaire is characterized by a high urban open unemployment rate. In Kinshasa, the main urban area, there is evidence that this rate has increased significantly since 1960, the date of independence. According to the 1967 Socio-Demographic Survey, it was estimated at 13 percent of the male population (over 15 years of age and not enrolled in school) [13, p. 106]. Compared with official government statistics in other LDCs, such a mean open unemployment rate is substantial, although higher rates have been estimated [17]. If anything, this estimate has a downward bias, since it is based on the assumption of a 100 percent labor force participation rate.

In this paper, it is argued that the open unemployment rate as usually defined is a highly incomplete measure of income inequality among laboring families in Zaire. This country, like many others in its geographic region and stage of development, has two important distinguishing characteristics: (1) a form of non-wage employment, which plays an important role in urban areas; and (2) individual sharing units which extend in size well beyond the nuclear

*The author is greatly indebted to Eric Nelson for suggestions, comments, and extensive research assistance. Gary Fields and Simon Kuznets provided several criticisms of an earlier draft. The author also wishes to acknowledge the assistance of M. Adolphe NZEZA, Directeur General of National Statistics Institute (INS), National Office of Research and Development (ONRD), Kinshasa and M. Cesar MPOYI, Assistant Director of INS, in charge of the Socio-Demographic Survey. They made access to these data possible.

Portions of this research were financed by funds provided by the Agency for International Development under contract CSD-2492. However, the views expressed in this paper do not necessarily reflect those of AID.

family. Our main hypothesis concerns the tendency of high levels of male unemployment (both open and disguised) to make the distribution of income less even. In its effect on aggregate well-being this tendency, we argue, has been partly offset by a complex process of sharing and retail commerce both within and between sharing units. Among other things, such a process causes the distribution of expenditure by household as defined by the 1960 (as opposed to 1970) United Nations census manual [18], to be more equal than that of measured wage income. It also brings into question the use of a concept of sharing unit such as the 1960 UN definition of household which refers only to those persons living under the same roof.¹ A second hypothesis is that much of the measured wage income inequality associated with unemployment and underemployment of migrants is not necessarily long-run. It is mainly a general lack of labor demand, attributable to capital scarcity and factor price rigidity, rather than a lack of training or experience, which prevents recent migrants from being employed in the modern sector.

We test these hypotheses by drawing upon published and unpublished data taken from two sources: the 1967 Socio-Demographic Survey of Kinshasa [13] conducted with the help of the French Technical Assistance and the 1970 Family Budget Survey conducted by Professor Houyoux [20].² A great deal of our analysis is based on published data. However, in assessing the definition of sharing units and mobility of migrants, we use unpublished micro data for St. Jean commune (part of Kinshasa) obtained in the 1967 Socio-Demographic Survey. St. Jean is characterized by per capita expenditure and education rates which are substantially below the median for all the communes in Kinshasa. It is among this group that significant sharing and mobility is alleged to be present. In addition, although this is not a "squatter" commune, the proportion of migrants in St. Jean is substantially above the median. Finally, there are very few European expatriates living in St. Jean.

The organization is as follows: in section I, summary measures of size distribution inequality are explained and estimates of these measures for the distribution of household expenditure in Kinshasa presented. In section II, we compare the size distribution of total expenditure for Kinshasa as a whole with that of cash wage income, and develop a model for determining a measure of expenditure dispersion by commune. The explanatory variables in this model include female activity as well as measures of labor-income inequality. In the case of St. Jean commune, we then show, in Section III, that 1960 UN households having high open unemployment rates tend to cluster geographically with 1960 UN households having low open unemployment rates, which is consistent with our hypothesis that the basic sharing group encompasses several housing units.

¹The difference between the 1960 and 1970 UN definitions of household is explained in detail in [19, p. 60]. The 1970 definition allows the number of housing units in a household to exceed one and stresses the functional aspects of the concept, in particular, "arrangements made by persons, individual or in groups, for providing themselves with food or other essentials of living."

²The 1967 Socio-Demographic Survey is based upon a 10 percent random drawing of all the *parcelles* (roughly equivalent to city blocks) in Kinshasa. The 1970 Family Budget Survey consists of what amounts to a 1 percent representative sample of the entire city. This sample was obtained through a 10 percent systematic selection of *parcelles* originally covered in 1967. For a critique of the 1967 Survey, particularly the uniformity of sampling, see [16].

It is argued that, under these conditions, estimates of income distribution or employment rates based on nuclear sharing units may have little meaning as indicators of general well being. In section IV, the distribution of lifetime or secular income as it relates to migration is discussed. The final section is composed of a summary of research findings.

I. SIZE DISTRIBUTION OF TOTAL INCOME

Size distributions of income and expenditure are examined in this paper by means of three summary measures of inequality: the Gini coefficient, the Kuznets index, and the coefficient of variation. The coefficient of variation is simply the standard deviation of the distribution divided by its mean. The two other measures may be interpreted by means of the Lorenz curves, depicted in Figures 1 and 2. The Gini coefficient compares shares of income actually held by each percentile of recipients to the share of income that would be held under conditions of perfect equality. The ratio is found by comparing the area (A) in Figure 1,

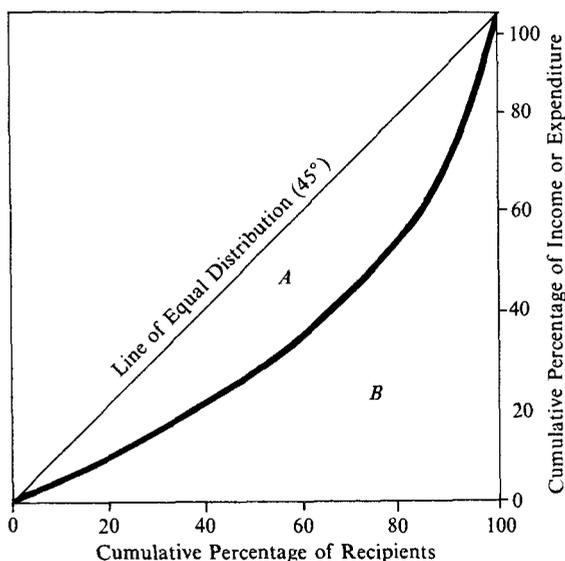


Figure 1. Lorenz Curve

the area between the 45° line and the actual Lorenz distribution, to the area (A + B), the total area under the diagonal. The Gini ratio goes to zero as the actual income distribution approaches perfect equality and 100 percent as the Lorenz distribution becomes more skewed.

The Kuznets index is an additive measure of how much individual group *per capita* incomes deviate from the mean *per capita* incomes for all groups independent of ordering—groups being in practice designated by occupational and geographical, as well as relative income, differences. In mathematical terms, this index is the sum of absolute differences between the percentage of total income in particular groups and the percentage of total members in these groups. The components of the Kuznets index may be illustrated by means of the Lorenz

curve, although the curve itself need not be estimated to calculate the index. In Figure 2, for example, the Kuznets index represents the absolute sum of the distances e, f, g, h, and i, corresponding to differences between separate 45° lines and points on the Lorenz curve for separate quintiles. The Kuznets index varies from 0 to 200.

The Kuznets index is more sensitive to concentration at the extreme ends of the distribution than is the Gini coefficient. Note, for instance, that the magnitudes of the distances e and i are high relative to f, g, and h in Figure 2. Owing to this sensitivity to extreme points, particularly at the upper end of the distribution, it is possible to have a situation in which the Gini coefficients are the same in two cases but the Kuznets ratio is considerably higher for the distribution having greater concentration in the highest quintile.

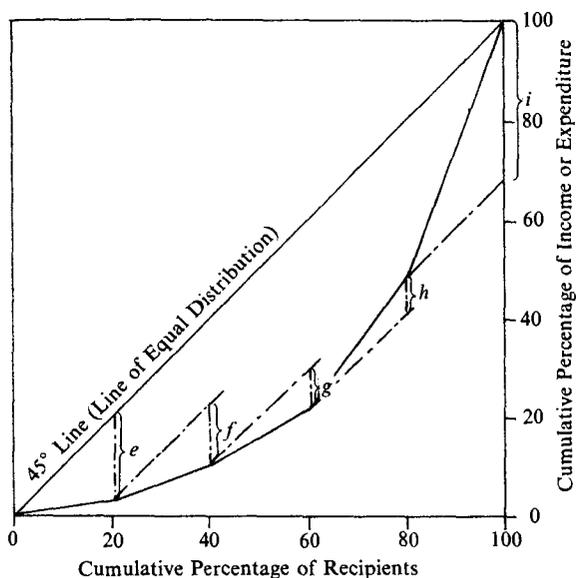


Figure 2. Calculation of Kuznets Ratio

As a proxy for total income, we use total expenditure, i.e., household income (both wage and non-wage income) less financial or money savings. To the degree that the financial savings rate is an increasing function of household income, summary measures of expenditure inequality will understate those of income inequality. This does not seem to be a serious problem in the Kinshasa case, since most household capital formation takes the form of commodity or real estate purchases rather than cash savings, and these purchases are included in the total expenditure figures.³

The size distribution of total expenditure by household can be estimated from Houyoux's sample survey of Kinshasa conducted in 1970 [20]. The three summary estimates of inequality (unadjusted for family size) are shown in Table 1. The coefficient of variation is calculated by aggregating individual household

³Note the low levels of private financial savings implied by the monetary and national accounts data in [1]. Private-sector demand and savings deposits are only 0.14 percent of GDP.

mean and variance data published by Houyoux for each of six expenditure categories; the Gini coefficient and the Kuznets index are calculated from the total number of households and mean levels of expenditure in each of these six cells. As summary measures of individual inequality, these estimates may well be biased since they are calculated from an ordering of recipient households by total household income rather than by income *per capita*.

Lacking the original household observations, one may bracket this error in the manner suggested by Kuznets using summary data on the distribution of families by size within the expenditure classes [10, pp. 31–33]. Four different family size

TABLE 1
SUMMARY MEASURES OF URBAN HOUSEHOLD EXPENDITURE INEQUALITY

	Kinshasa (1970)	Urban India† (1951–52 to 1959–60)
Gini coefficient of total household expenditure (based on six expenditure classes)	37	
Gini coefficient adjusted for family size*	37	38
Kuznets index of total household expenditure (based on six expenditure classes)	55	
Kuznets index adjusted for family size*	54	56
Coefficient of variation of total household expenditure (based on entire sample)‡	92	

*The Gini coefficient and Kuznets index for Kinshasa adjusted for family size were calculated from published data on the distribution of households by size within six household expenditure classes. There were four family-size groupings: 1–3 persons, 4–5 persons, 6–8 persons, more than 9 persons. See source (a) below. The Indian summary measures given in source (b) below are estimated from individual household observations originally ordered on the basis of household *per capita* expenditure.

†These figures represent a nine-year average of annual estimates. In other words, they do not reflect the distribution of average income by household over a nine-year period and are merely an average of indices of short-run inequality.

‡This figure was computed from data on mean household expenditure, number of households, and the coefficient of expenditure variation by expenditure class presented in source (a) below.

Sources for Table 1:

(a) Université Nationale du Congo, IRES, “Resultats Partiels de Conditions de Vie à Kinshasa,” September 1971.

(b) S. Swamy, “Structural Changes and the Distribution of Income by Size”, *Review of Income and Wealth*, Series 13/2 (June 1967).

cells are available for each of the six different household expenditure categories in Houyoux’s sample. The expenditure distribution may be re-estimated by taking the mean expenditure levels in each of these cells and ordering them from the lowest to the highest on the basis of *per capita* expenditure. The recipient shares in this case are based on the total number of persons rather than households in each group. This adjustment has virtually no effect on the Kuznets index and Gini coefficients based on cell means.⁴ By contrast, similar adjustments caused

⁴ The coefficient of variation of the original household observations cannot be approximated using cell means.

increases in the Kuznets index in the cases of country-wide distributions for Puerto Rico, Great Britain, the Netherlands, and the United States [10, pp. 33]. This difference is particularly extraordinary when one recognizes that summary measures of income inequality adjusted in this way may well be biased upward. The assumption is made that, within each of the six expenditure categories, expenditure is independent of household size. Yet, evidence for other countries, e.g., [4, p. 37], indicates that the expenditure level is likely to be greater for large than for small households even when a large number of expenditure cells is available.

The Gini coefficient and Kuznets index computed from 24 cells are slightly below the average of those obtained by Swamy for urban India for the 1951–60 period; see Table 1. Swamy's estimates are based on the published National Sample Survey results, in which the size distribution is derived from *per capita* rather than total household expenditure. Hence, given the probable upward bias of our family-size adjustment, the expenditure inequality in Kinshasa may well be significantly less than that in urban India. This is consistent with the view that inequality is an increasing function of *per capita* income in the urban sector during the early stages of development. Food represents a higher proportion of total expenditure in Kinshasa (67 percent) than it does in urban India (59 percent) indicating that *per capita* total expenditure is higher in urban India.⁵

II. A COMPARISON OF WAGE AND EXPENDITURE DISTRIBUTIONS

Houyoux's sample also provides information on the level of household expenditures by occupational status of head of household. Thus, even though data on wage income by expenditure category are not available, it still is possible to make a comparison of the distribution of household expenditure and wage income.

To effect this comparison, mean levels of expenditure were calculated for households in different occupational statuses, including that of head of household being unemployed. Based on the mean wage rates for each of these occupational categories taken from firm data presented in [9], the share of total wage income earned by heads of household in different occupational groups was estimated.⁶ The wage distribution by occupational status was derived under two different assumptions, one which included wages of government workers in calculating the mean wage of the employee group and one which did not. This information is summarized in Table 2.

The Lorenz curves representing wage and expenditure distributions derived from these data are shown in Figures 3 and 4. When the wages of government workers are included, it is clear that the Lorenz curve for household expenditure in Figure 3 lies entirely inside that for wage income indicating that the expenditure distribution is unequivocally more equal than the wage distribution. This is less obvious in the case where government wages are excluded, as part of the

⁵The estimate of the share of food expenditure in urban India is based on the seventh round of the National Sample Survey (October, 1953–March 1954), the results of which are presented in [14]. The food share estimate for Kinshasa refers to 1970 and is taken from [20].

⁶The source for the mean wage rate estimates is explained in detail in Table 2.

TABLE 2
TOTAL SHARE OF CONSUMPTION EXPENDITURE, 1970,
AND OF WAGE INCOME EARNED BY HEAD-OF-HOUSEHOLD,
1967, BY OCCUPATIONAL GROUP; KINSHASA

Occupational Group	Consumption Expenditure		Wage Income Receipts*			
	Households		Households	Excluding Government Wages	Including Government Wages	
	No.	%	%	%	%	%
Cadres	75	5.1	16.0	7.0	19.6	17.1
White-collar	258	17.5	20.3	24.2	20.3	30.6
Skilled and Semi-skilled workers	429	29.2	24.3	40.3	44.4	38.7
Unskilled workers	251	17.1	11.3	23.6	15.7	13.7
Independents	222	15.1	16.0			
Independent women	114	7.7	6.5			
Unemployed	52	3.5	1.8	4.9	0.0	0.0
Others	70	4.8	3.8			
	1,471	100.0	100.0	100.0	100.0	100.0

*Wage income is calculated using Kazadi data, using the salary scale for Enterprise No. 29 (p. 454), computing the geometric average of salaries within each occupational group, unweighted; monthly and annual salaries are adjusted on a daily basis. To estimate the salary of white-collar workers, the wages of skilled workers were weighted by a factor determined by the relative salaries of white and blue collar workers in Enterprise No. 23. White-collar salaries were also estimated by including government salaries in the average, yielding a different distribution as shown above. No adjustment was made for differing numbers of wage-earners per family or for different distributions of occupations within the larger occupational groups.

Sources: Lazadi wa Dile, Jacques-S. *Politiques salariales et développement en République Démocratique du Congo*, Editions Universitaires, Paris, 1970, pp. 446, 454. Université Nationale du Congo, IRES, September 1971, "Résultats partiels de l'enquête sur les conditions de vie à Kinshasa."

wage distribution curve in Figure 4 lies inside the expenditure distribution curve. The summary measures indicate that wage income is more unevenly distributed in both cases than is the expenditure distribution. When government employees are included, the Gini coefficient and Kuznets index for the wage distribution are 24.6 and 32.9 respectively. When government employees are excluded, these ratios are 24.2 and 33.4. In both cases they are definitely above the Gini and Kuznets ratios for the expenditure distribution by occupational status, which are 20.1 and 29.3 respectively, indicating greater inequality of wages than of expenditures.

If the only alternative source of income, other than the wage income of the head of household, was the earning from assets, we would expect the household expenditure distribution to be less even than the wage distribution. In most countries, income from assets is more unevenly distributed than wage income and positively correlated with occupational status. In view of this, the greater

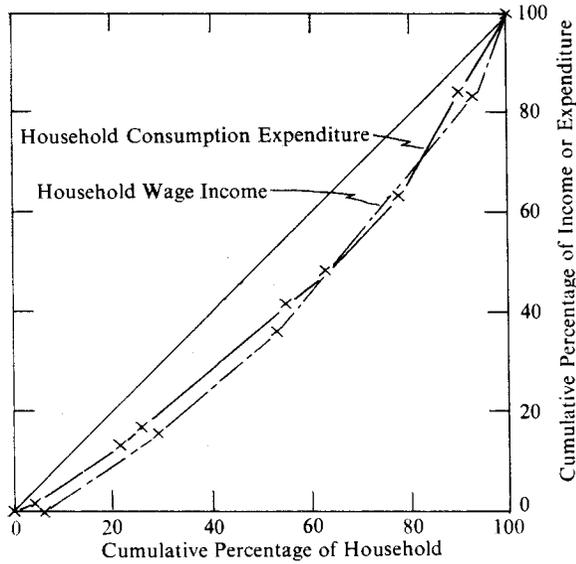


Figure 3. Distribution of Wage Income and Consumption by Household, Grouped by Employment Category; including Government Sector Wage in White-Collar Kinshasa, 1970

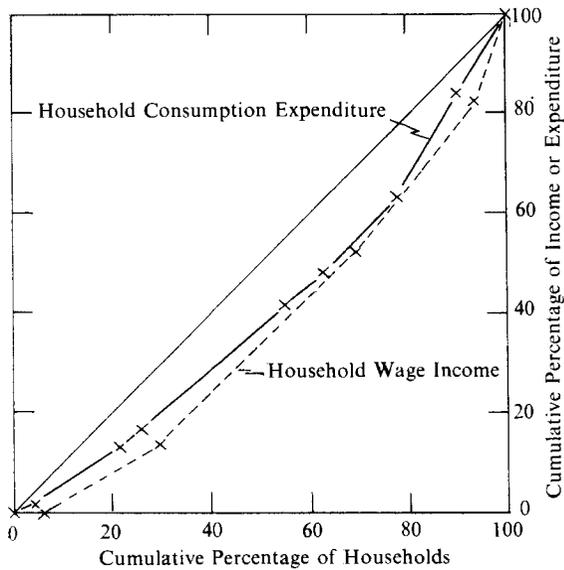


Figure 4. Distribution of Wage Income and Consumption by Household, Grouped by Employment Category; excluding Government Sector Wage in White-Collar Kinshasa, 1970

evenness of the expenditure distribution is remarkable; although the urban capitalist class in Zaire is not as developed as it is in other countries, it is definitely present.

The greater evenness of the expenditure distribution relative to the wage distribution may well be attributable to the entrepreneurial earnings of women.

Based on his entire 1970 sample survey, Houyoux has estimated that non-wage income accounts for about 50 percent of family income, an extraordinarily high figure. The activities of the female account for most of the non-wage income of households in Houyoux's samples. These activities take three main forms: (1) urban agricultural labor which may provide families with some food, (2) retailing, and (3) prostitution.

With regard to the amount of income generated, retail commerce is by far the most important activity. Most of the detailed published information on this activity is based on a preliminary sample of 60 households (a pilot study for the 1970 survey) analyzed by Houyoux and Houyoux [5]. This sample was separated into different categories on the basis of the head of household's occupational status. These included, in order of mean income, the unemployed, semi-skilled, skilled workers, employees, teachers, and managers. For the most part the higher the occupational status of a male head of household, the lower the prevalence of commercial activity on the part of the females.⁷ This relationship is consistent with a modified version of the additional worker hypothesis applied to developed country labor markets [12], [21].⁸

Additional evidence on the impact of female economic activity on the size distribution of expenditure may be marshalled by using available data to test a model of expenditure inequality. Houyoux's results provide data which enable us to compute the coefficient of variation of household expenditure for 21 communes for one month in 1970. The published results of the 1967 Socio-Demographic Survey (referring to a single point in time, the sampling day) provide detailed occupational status classifications and information on the proportion of females active in the labor force for each of these communes, although information on their earnings is unavailable. The latter variable should be viewed only as a proxy for the total number of employed and self-employed women. For one thing, it includes the women engaged in "full-time" but not "part-time" commercial activity.⁹ By assuming that each commune faces the same set of mean wage rates, we may estimate the coefficient of variation of male wage income by occupational status for each commune (excluding the unemployed). Denote this variable by V_0 and the coefficient of variation of household wage income by commune by V_w , and assume that

$$(2.1) \quad V_w = nV_0$$

where n is a constant. Suppose, furthermore, that the household expenditure function takes the form

$$(2.2) \quad \log c_j = \alpha + \beta \log w_j + \delta \log nw_j$$

⁷The effectiveness of commercial activity is based on first-degree price discrimination providing high retail-supplier price margins. Put more precisely, there are strong possibilities for lower per-unit prices as the amount of the commodity purchased increases. This is attributable to a highly personalized distribution system.

⁸According to this hypothesis, the time the wife is willing to devote to employment in market, as opposed to household or leisure activity is a decreasing function of her husband's wage rate. In the Kinshasa case, it is for the most part female entrepreneurial activity, not labor services in the strictest sense, which is inversely related to the husband's income.

⁹The definition of females in the active labor force is explained in detail in [13, p. 105].

where c_j is expenditure of the j th household, and w_j is male wage and nw_j is non-wage and female wage income of the j th household. Assume that the distribution of income and expenditure is approximately log normal, which, given the available evidence, seems to be a perfectly reasonable simplification.¹⁰ Then we have

$$(2.3) \quad V_c^2 \approx \beta^2 V_w^2 + \delta^2 V_{nw}^2 + \beta \delta c(w, nw)$$

where $c(w, nw)$ is the covariance of the logs of the two forms of income. (If the distributions are log normal, the variance of the logs of w_j and nw_j are equal to the squares of the coefficients of variation V_w and V_{nw} .) The covariance term will be negative if female commercial activity accounts for most of nw_j , since it is negatively associated with recorded household wage income. Hence the proportion of economically active females in each commune may well be negatively associated with $c(w, nw)$; *cet. par.* the higher this proportion the smaller will be the mean share of non-wage income derived from sources other than female earnings (e.g., rentier income). Further, an increase in the proportion of active females will probably decrease the coefficient of variation of nw_j , to the extent that a more even distribution of female labor force participation is implied. Thus we would expect the total effect of a rise in the proportion of economically active females to be one that decreases the coefficient of variation of expenditure V_c .

Given these hypothesized qualitative relationships, a regression model may be derived in the following manner. Substitute equation (2.1), determining V_w from the coefficient of variation of wage income by occupational status categories, V_0 , into (2.3). Denote the normally distributed error term by ϵ and the estimates of β and n by $\hat{\beta}$ and \hat{n} respectively. Denote the proportion of the labor force made up of economically active females by F . Then, assuming that V_c^2 is a linear function of F , we have

$$(2.4) \quad V_c^2 = a + bV_0^2 + cF + \epsilon$$

where

$$\begin{aligned} b &= \hat{\beta}^2 \hat{n}^2 > 0 \\ c &< 0 \\ a &\leq 0 \end{aligned}$$

This equation was fitted to data for 21 communes. The independent variables were computed from mean wage rates in 1967 from Kazadi appendix data for firms known to be in Kinshasa and labor force data by commune taken from the 1967 Socio-Demographic Survey.¹¹ The dependent variable was computed from

¹⁰Given the estimated mean and variance of the logs of expenditure in Houyoux's budget study, theoretical log normal frequencies were constructed for each of the six expenditure categories. The observed frequencies did not differ significantly from the theoretical frequencies in that the estimated chi-square statistic, 0.229, was below the cut off value of the 99 percent significance level with 4 degrees of freedom, 0.297. This implies that the chi-square statistic is not significantly different from 0 at 99 percent level and that the null hypothesis that the two frequency distributions are identical should be accepted.

¹¹The mean wage rates were obtained by computing the geometric average within each occupational group unweighted and by included government salaries in the white collar average. The individual wage rates are given in Kazadi's book [8, pp. 446, 454].

Houyoux's 1970 sample. The ordinary least squares regression procedure yielded:

$$(2.5) \quad V_c^2 = -6.11 + 5.95V_0^2 - 2.45F$$

$$\quad \quad \quad (-8.58) \quad (9.25) \quad (-3.11)$$

$$R^2 = 0.81$$

(The numbers in parentheses under the estimated coefficients represent *t* statistics). The coefficients for both the *F* and V_0^2 variables have the hypothesized sign and are significantly different from zero at the five percent level. The order of magnitude of the equalizing effect of female commercial activity on the distribution of household expenditure may be obtained by estimating the associated increase in the coefficient of variation of household expenditure when the female labor force participation rate is zero and V_0^2 is held constant at its mean level. Given the estimated coefficients in (2.5) the V_c will rise from a mean value of 0.59 (computed by taking the square root of the arithmetic average of the V_c^2 's) to a value of 0.65. Given log normality, a coefficient of variation 0.59 implies that the ratio of the median income in the highest to that in the lowest decile is 7.8. When the coefficient of variation rises to 0.65, this ratio increases to 8.7. Moreover, as hypothesized, the simple correlation coefficient involving V_0^2 and *F* is significantly positive at the five percent level. Hence, as a result of female employment and commercial activity, well-being is enhanced through an improvement in equity as well as an increase in mean household expenditure.¹²

To the extent that females engage in retailing, the distribution of real expenditure may be considerably more even than that of money expenditure. (It is only for the latter distribution that we have data). Since food bought at bulk price discounts may be consumed by the family itself as well as sold for income, females often provide retail services within the family unit. The family expenditure records analyzed by Houyoux and Houyoux provide some evidence that such retail services are being supplied [5]. Therefore, the food prices paid by families with relatively low wage income (as conventionally recorded) who exhibit high female economic activity rates should be less than those paid by families with relatively high wage earnings received by male household head, but low female activity.

III. AN ALTERNATIVE SHARING UNIT

Another reason for the distribution of expenditure being more even than that of wage income concerns the possibility that there may be sharing of wage income among several households located close together geographically. Such a possibility provides the motivation for examining the impact on the distribution of wage income of choosing a recipient unit encompassing a larger contiguous geographic area than the household (1960 UN definition). Since the mean number of laborers per household (1960 UN definition) is only slightly over one, a high open unemployment rate implies that there is large percentage households earning no wage income at all. For this reason, the existence of substantial open

¹²It is difficult to draw conclusions regarding changes in welfare since such variables as the "disutility" of work to the female cannot be measured.

unemployment is a major factor causing inequality in the distribution of household wage income. However, the impact of open unemployment on real expenditure inequality among individuals may not be nearly as great if the relevant sharing unit involves several households and there is a tendency for households with unemployed laborers to be associated with larger sharing units than households which are fully employed. This follows from economies of scale in consumption and the fact that the variance of the employment rate across units usually decreases as the number of laborers in each unit rises.

The city of Kinshasa is cadastrally divided into *parcelles*, multi-dwelling plots, housing several nuclear families, often blood-related. If the *parcelle* (generally translated as compound) rather than the household is chosen as the sharing unit, there is evidence that both the expenditure and wage distributions would be a great deal more even. For one thing, the arithmetic mean of the *parcelle* employment rates in St. Jean, 0.91, is a good deal higher than that of the household employment rate, 0.88; this average implies a mean open unemployment rate by *parcelle* which is 25 percent lower than the mean open unemployment rate of the households. Moreover, from Table 3, it is clear that *parcelles*

TABLE 3
DISTRIBUTION OF *Parcelles* AND EMPLOYMENT RATES BY NUMBER OF
LABORERS PER *Parcelle*, ST. JEAN, KINSHASA, 1967

Number of Laborers per <i>Parcelle</i>	Number of <i>Parcelles</i>	Employment Rate	Variance
0	1	0	0
1	97	0.979	0.020
2	39	0.897	0.042
3	36	0.870	0.040
4	33	0.879	0.040
5	28	0.814	0.035
6 or more	42	0.872	0.027
Group averages:			
0-2 laborers per <i>parcelle</i>	137	0.945	0.040
3-12 laborers per <i>parcelle</i>	139	0.860	0.037

Source: Unpublished data sheets for the 1967 Socio-Demographic Survey of Kinshasa provided by the National Statistical Institute (INS), National Office of Research and Development (ONRD).

consisting of more than 2 laborers account for most of the unemployment in St. Jean. The mean employment rate for *parcelles* with two or fewer laborers (0.945) is significantly greater at the five percent level than the mean employment rate for *parcelles* with three or more laborers (0.860). This would not be the case if the probability of an individual being employed was independent of the size of the parcel. The St. Jean data also shows that the proportion of the total number of unemployed laborers is substantially higher in the case of parcels in which there are at least two laborers who are employed than in those where absolute employment is lower. Hence, given that there is sharing within the *parcelle*, most

unemployed workers have access to some wage income and, because they are associated with a larger primary group, may enjoy lower per unit consumption cost through bulk purchase than do unemployed workers.

IV. LIFETIME EARNINGS INEQUALITY AND MIGRATION

The summary measures of expenditure inequality discussed in this paper refer to a period of one month and those of wage income inequality to a point in time (the date of the sample). The distribution of the present discounted value of lifetime earnings may differ considerably from these distributions involving a very limited period of time. In cases where there is rapid upward mobility in employment status and income from physical capital assets is insignificant, we should expect the present value of lifetime earnings per economic unit to be distributed considerably more evenly than observed annual earnings. We would expect the opposite to be the case in a situation where: (a) earnings from physical capital make up a large portion of income (given that the rate of capital accumulation is an increasing function of household income); and (b) there is very little upward mobility in employment status.

A *prima facie* case may be made that it is possible to achieve greater equality in the distribution of lifetime earnings for a given cohort by increasing the output growth rate of the urban non-service sectors. This increase in equality of the distribution of secular income would be achieved by reducing the average period which migrants spend in service sector employment where wage rates may be relatively low. This argument is supported first by the fact that the employment rate of non-migrants is not significantly greater than that of migrants from the countryside. The unemployment rate for rural-urban migrants does not exceed that for the rest of the population enough to make the two rates significantly different at the 5 percent level when the chi-square test is used.¹³

Secondly, there is evidence that at least some migrants move from service to non-service sector employment. On the basis of the St. Jean sample, the proportion of males employed in the service sector appears to be a decreasing function of the length of time spent in the city.¹⁴ The evidence of this relationship, presented in Table 4, is not based on panel data but rather on a cross section sample of male migrants from all sources taken at the same point in time. Hence, the possibility that sector of employment by year of migration across space is determined by changes in the composition of labor demand over time, rather than inter-sectoral labor mobility, cannot be completely rejected. Only to a small degree, however, does time series employment data applying mainly to the post-independence era support this alternative explanation. Data for employment by sector over time is presented for the 1958-68 period in an article by Dupriez and Ngoie [2]. These data show a marked decrease in industrial employment of Africans during the 1958-61 period and significant growth during the 1962-65 and 1966-67 periods. By contrast, the proportion of 1958-61 migrants employed

¹³This evidence is presented in detail in [11, p. 18].

¹⁴This is consistent with Johnson's empirical result for Nairobi, Kenya [6]. After controlling for such factors as age and tribe, he finds that the wage rate of a migrant worker is an increasing function of the length of time spent in the city.

TABLE 4
EMPLOYMENT BY INDUSTRY IN SERVICES CLASSIFIED BY DATE OF MIGRATION, ST. JEAN, KINSHASA, 1967*

		Non-Migrant	1913-1922	1923-1932	1933-1942	1943-1952	1953-1957	1958-1961	1962-1965	1966-1967	Unknown:		Total
											Pre-1960	Post-1960	
Industry	No	23	2	6	8	29	19	20	30	3	7	1	149
	%	21.7	33.3	15.4	11.9	25.7	20.7	24.7	23.6	10.3	26.9	33.3	20.0
Construction	No.	3	1	3	9	14	10	6	7	3	3	—	60
	%	2.8	16.7	7.7	13.4	12.4	10.9	7.4	5.5	10.3	11.5	—	8.1
Commerce and banking	No.	20	2	12	14	27	12	12	18	6	4	—	127
	%	18.9	33.3	30.8	20.9	23.9	13.0	14.8	14.2	20.7	15.4	—	17.0
Transport and communication	No.	10	—	5	10	12	21	9	18	2	2	—	89
	%	9.4	—	12.8	14.9	10.6	22.8	11.1	14.2	6.8	7.7	—	11.9
Services	No.	46	1	13	21	31	28	31	51	14	9	2	301
	%	43.4	16.7	33.3	31.3	27.4	30.4	38.3	40.2	48.3	34.6	66.7	40.4
Other and undefined	No.	4	—	—	5	—	2	3	3	1	1	—	19
	%	3.8	—	—	7.5	—	2.2	3.7	2.4	3.4	3.8	—	2.6
Total		106	6	39	67	113	92	81	127	29	26	3	745

Source: Unpublished data sheets for the 1967 Socio-Demographic survey of Kinshasa provided by the National Statistics Institute (INS), National Office of Research and Development (ONRD).

*The percentage under each number represents the proportion of the total number of persons in each column.

in industry is greater than the proportion of 1962–65 migrants and still greater than the proportion of 1966–67 migrants. Further evidence supporting the point that migrants were absorbed into their present sector of employment with some (but not an extensive) lag is brought out in the case of construction. In this sector, there was a marked reduction in the employment of Africans during 1958–61 for Kinshasa as a whole which was succeeded by a substantial increase during the 1962–65 interval. Again, while the rate of growth of labor demand was an increasing function of time, the proportion of migrants employed in the construction sector was a decreasing function of the year of migration. The proportion migrating during 1958–61 employed in that sector in 1967 is much greater than the proportion migrating during 1962–65 in the St. Jean sample.

The Dupriez and Ngoie data indicate that service sector employment of Africans grew at roughly a constant annual rate throughout the entire 1958–68 period. At the same time, there may have been higher turnover rates in services than in industry and construction simply because wage rates tend to be higher in the latter two sectors. The open unemployment among males who migrated to Kinshasa in 1958–61 is much higher than the open unemployment rate for those who migrated in 1962–65, although not quite as high for the 1966–67 group, who are the most recent migrants. Hence, the higher proportion of 1958–61 migrants employed in both industry and construction may well have been associated with movement out of service occupations rather than a decrease in open unemployment rate of the 1958–61 migrants during the 1962–65 period.

This is evidence that the elasticity of substitution between recent migrants and other laborers is greater than zero in the non-service sectors. In other words, given increases in the variables determining general labor demand in the non-service sectors such as commodity prices and capital stock, the number of recent migrants employed in the non-service sector will increase when there is a shortage of more experienced labor. Consequently, provided the wage differential between migrants and other workers in the non-service sectors widens only temporarily, the distribution of lifetime income for a particular cohort will become more even due to a more rapid shift service to non-service sector employment.¹⁵

V. CONCLUSIONS

In this paper, we have produced evidence indicating that the distribution of real expenditure per sharing unit tends to be more even in Kinshasa than one would expect on the basis of the high open unemployment rate and the degree of inequality in the distribution of wage income. We have shown that such relative equality in the distribution of expenditure is partly attributable to a lack of imputation in that wage and employment statistics for Kinshasa are based on the assumption that in most cases only males are economically active. As a consequence, the returns to a great deal of self-employment on the part of females, along with the retailing services they provide the household, are not taken into account in the measurement of wage and employment rates. The importance of

¹⁵By controlling for migration cohort, we abstract from the increased probability of migration due to non-service sector employment opportunities implied in the Harris-Todaro model [3] among others.

this omission is brought out in a cross-section regression involving data from a representative sample of Kinshasa as a whole. These findings indicate that, in line with the "additional worker" hypothesis applied to developed countries, the degree of economic activity on the part of women in the household is inversely related to a male head's income to a statistically significant degree [12, 21].

Based on data for St. Jean commune, there is evidence that, when the dimension of the sharing unit is extended beyond that of the household (1960 UN definition), unemployed workers appear more frequently in units where there are at least some employed workers. The alternative sharing unit in this case is the *parcelle* (plots comprising several households which may be related) rather than the household. The choice of the *parcelle* as the relevant sharing unit is arbitrary, but there is evidence that at least some sharing takes place among as well as within the households in the *parcelle* [5]. The fact that there is sharing of goods among households in addition to the evening effect of female self-employment causes measures of inequality in male wage income to overstate the degree of inequality in real household consumption, as well as expenditure (which does not include gifts).

The proportion of persons employed in non-service activities has been observed in the St. Jean case to be an increasing function of total time spent in the city after migration. Despite the lack of panel data, we think that this can legitimately be interpreted as evidence of some rapid upward mobility. Time series data shows many of those now employed in non-service activity probably did not go directly into this activity upon entering the city. Such evidence supports the hypothesis that, for a given cohort, the proportion of recent migrants employed in the non-service sectors can be increased—and possibly the distribution of expected lifetime income made more even—by policies which increase the demand for labor in these sectors but which do not necessarily involve subsidized manpower training. This approach seems preferable to one which emphasizes modernization of the urban distribution system. A strong argument can be made that this system, because of its very lack of transport equipment and structures, has created commercial employment for women in poor households and provides an incentive for sharing among households.

REFERENCES

- [1] Banque du Zaïre, *Rapport Annuel*, 1970-71.
- [2] Dupriez, G. and M. Ngoje, "Emploi dans le Secteur Privé et les Parastataux (1965-1968)," *Cahiers Economiques et Sociaux*, Vol. 8 (March 1970).
- [3] Harris, J. and M. Todaro, "Migration, Unemployment and Development: A Two-Sector Analysis," *American Economic Review*, March 1970, pp. 126-142.
- [4] Hinrichs, A., "Personal Income Distribution and Consumption Pattern in Taiwan—1964," *Industry of Free China*, November 1964, pp. 30-48.
- [5] Houyoux, C. and J., "Les conditions de vie dans soixante familles à Kinshasa," *Cahiers Economiques et Sociaux*, 8 : 13 (1970) pp. 99-132.
- [6] Johnson, G., "An Empirical Model of the Structure of Wages in Urban Kenya," Institute for Development Studies, Staff Paper, June 1972.
- [7] Jurion, F. and J. Henry, *Can Primitive Farming be Modernized?* Published with the assistance of the Belgian Cooperation and Development Office, 1969.
- [8] Kazadi wa Dile, J., "Les Salaires," IRES, Université Lovanium, Kinshasa, Congo, *Cahiers Economiques et Sociaux*, Vol. 7, September 1969, pp. 265-284.

- [9] Kazadi wa Dile, J., *Politiques salariales et développement en République Démocratique du Congo*, Editions Universitaires, Paris, 1970.
- [10] Kuznets, S., "Quantitative Aspects of the Economic Growth of Nations: VIII, Distribution of Income by Size," *Economic Development and Cultural Change*, XI, 2, Part II (January 1963).
- [11] McCabe, J., "Unemployment as a Social-Welfare Problem in Urban Zaire," Economic Growth Center Discussion Paper No. 163, Yale University, November 1972.
- [12] Mincer, J., "Labor Force Participation of Married Women," *Aspects of Labor Economics*, National Bureau of Economic Research, 1962, pp. 63-105.
- [13] République Démocratique du Congo, Institut National de la Statistique (avec la Coopération de l'Assistance Technique Française), *Etude Socio-Démographique de Kinshasa 1967, Rapport General 1969*.
- [14] Roy, J. and Dhan, S. K., "A Study on the Pattern of Consumer Expenditure in Rural and Urban India," *Studies on Consumer Behavior*, Indian Statistical Series No. 6, New York: Asia Publishing House, 1960.
- [15] Swamy, S., "Structural Changes and the Distribution of Income by Size: The Case of India," *Review of Income and Wealth*, Series 13/2 (June 1967).
- [16] St. Moulin, Leo de and Ducreux, Maurice, "La Technique et le Deroulement de l'Etude Socio-Démographique de Kinshasa," 1967, ONRD, *Etudes Congolaises* 11 : 4 (IV 168), pp. 20-30.
- [17] Turnham, D., *The Employment Problem in Less Developed Countries: Review of Evidence*, Development Center of the OECD, Paris 1971.
- [18] United Nations, *Principles and Recommendations for National Population Censuses*, Statistical Papers, Series 19, No. 27 (United Nations Publication Sales No. 58 XVII.5), para. 407.
- [19] United Nations, Department of Economic and Social Affairs, Population Studies No. 15, *Variables and Questionnaire for Comparative Fertility Surveys*, New York, 1970
- [20] Université Nationale du Congo, Campus de Kinshasa, IRES, *Resultats partiels de l'enquête sur les conditions de vie à Kinshasa*, September 1971.
- [21] Woytinski, W., *Additional Workers and the Volume of Unemployment*, Pamphlet Series 1, New York: Social Science Research Council, 1940.