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3. AUTHOR(S)
 Ballentine, J.G.; Soligo, Ronald

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9. ABSTRACT

Examines the interrelationship between the consumption and earnings patterns of different income classes, using data for Colombia. The hypothesis tested is that the poor tend to consume goods and services produced with factors of production owned primarily by the poor, while the rich consume those produced by factors owned primarily by the rich. The methodology employs an input-output table which is closed to the household sector but which disaggregates that sector in terms of both the consumption of final goods and services and the allocation of value added in each producing sector. Consumption data are grouped by three income classes: roughly the bottom 70%, the middle 24%, and the top 6% of the work force. Value added is disaggregated further into factor source of income and sectoral source (agricultural vs. nonagricultural). The interrelationship of consumption and earnings patterns is analyzed by simulating a tax-transfer scheme in which a tax of 10% of factor earnings is levied on the top 6% and the revenue allocated equally among the bottom 70%. The results of the study show no support for the hypothesis tested; expenditures by the poor tend to increase factor earnings by the rich more than those of the poor. This conclusion is at variance with those of other studies for Colombia and other countries. Those studies generally show the effect of a tax-transfer scheme to be an increase in the demand for labor and a decrease in the demand for capital. This study shows that the distribution of factor earnings is little affected by a redistribution of income. There are three possible reasons for the discrepancy. The data employed may not be reliable enough. Secondly, studies which have looked only at factor demand have typically used a highly aggregated services sector, while the input-output table used in this study separates out personal services. Thirdly,

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because of wage differentials, changes in employment may not correlate very strongly with changes in labor earnings. Finally, it is important to remember that the results of this study reflect the effects of a tax-transfer scheme on the distribution of factor earnings, given the present distribution of wealth among the different income groups. Policies which attempt to alter the distribution of income by changing the distribution of wealth will have different effects. For example, if the distribution of land ownership were changed in favor of the poor, the second-round effects of this policy would reinforce the initial change. The increased expenditures by the poor would generate a larger increase in the earnings of the poor from their now larger wealth holdings, in addition to the increase in labor earnings from increases in employment.

PROGRAM OF DEVELOPMENT STUDIES
121 Sewall Hall
WILLIAM MARSH RICE UNIVERSITY
Houston, Texas 77001

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Consumption and Earnings Patterns
and Income Redistribution

by

J. Gregory Ballentine
and
Ronald Soligo

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The authors are Assistant Professor of Economics at Wayne State University, and Professor of Economics and Director of the Program of Development Studies at Rice University, respectively. This paper reports research conducted under AID contract AID/csd-3302 and AID/otr-C-1394 on "Distribution of Gains, Wealth and Income from Development."

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Abstract

Consumption and Earnings Patterns and Income Redistribution

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This paper examines the interrelationship between the consumption and earnings patterns of different income classes using data for Colombia. In particular, the paper attempts to test the hypothesis that the poor tend to consume goods and services produced with factors of production owned primarily by the poor while the rich consume those produced by factors owned primarily by the rich.

The methodology employs an input-output table which is closed to the household sector but which disaggregates that sector in terms of both the consumption of final goods and services and the allocation of value added in each producing sector. Consumption data are grouped according to three income classes representing roughly the bottom 70%, the middle 24%, and the top 6% of the work force. Value added is disaggregated further into factor source of income and sectoral (agriculture vs. nonagriculture) source.

The interrelationship of consumption and earnings patterns is analyzed by simulating a tax-transfer scheme in which a tax of 10% of factor earnings is levied on the top 6% and the revenue allocated equally among the bottom 70%. The results of the study show no support for the hypothesis tested. Differences which occur work perversely; expenditures by the poor tend to increase factor earnings by the rich more than those of the poor and vice versa. This conclusion is at variance with that of other studies for Colombia and other countries which generally show the effect of a tax-transfer scheme to be an increase in the demand for labor and a decrease in the demand for capital. Some factors which would reconcile the two sets of conclusions are suggested.

Consumption and Earnings Patterns and Income Redistribution

1. Introduction

In recent years many development economists have stressed the importance of improving the status of the poorest subgroups in developing economies.¹ This emphasis arose as it became clear that in many countries even rapid development has had only slight effect on the majority of people at the low end of the income distribution. Problems of unemployment, underemployment, and urban and rural poverty in developing countries are now being examined by themselves and not simply as they relate to increasing the rate of aggregates.

In the examination of these and other issues in economic development the interrelationship between the consumption and earnings patterns of different income classes is a potentially important factor. This interrelationship determines how some initial change in the distribution of income which results from a specific policy change works its way through changes in the composition of final demand for goods and services to changes in factor demand resulting from these changes in product mix, and finally to the ultimate change in income distribution. As an example of the

¹See Hollis B. Chenery et al, Redistribution with Growth (London: Oxford University Press, 1974).

potential effects of this chain, consider a land reform program designed to directly aid low income farmers. Such a program will be more efficient in aiding the poor if those who receive more land spend their incremental income on goods and services supplied largely by other low income workers, and if wealthy landlords from whom land is transferred respond by reducing their consumption of capital intensive goods (the production of which generates income largely for other rich groups). The program will be less effective if the poor spend their incremental income on capital intensive goods while wealthy landlords greatly reduce their consumption of goods and services produced by poor workers.

The importance of the consumption-earnings relationship has been recognized and discussed in several contexts. For example, in examining structural inflation in Brazil, Georgescu-Roegen argued that the recipients of subsidized credit have high incomes and consume largely capital intensive goods which generate income for other rich persons while poor workers consume labor intensive goods which generate income largely for the poor.¹ The authors of the ILO report on the employment problem in Colombia arrived at a similar hypothesis and suggested that a redistribution of income from the rich to the poor would increase the level of employment by changing the output mix toward more labor intensive goods and services.² They argued, in addition, that such a redistribution might also permit a higher growth rate of output and employment since the composition of demand would shift towards goods with lower capital-output ratios and towards domestically

¹Nicholas Georgescu-Roegen, "Structural Inflation Lock and Balanced Growth," Economies et Societes, Cahiers de l'I.S.E.A., Tome IV, no. 3 (Mar.1970).

²International Labour Office, Towards Full Employment (Geneva: International Labour Office, 1970).

produced goods--economizing both on scarce domestic savings and foreign exchange. Although they do not say so, there is a clear implication that the increase in employment which follows from the initial redistribution of income will lead to a further increase in distributional equity.

Land and Soligo explored the implications of the factor intensity hypothesis within the context of a general equilibrium model in which there is limited factor substitutability in production.¹ The model focuses on the effects of changes in the distribution of capital (land, human capital, and real capital goods) on the level of output, employment and incomes of the poor, and arrives at conclusions similar to those of the ILO report.

Morawetz,² Cline,³ and Soligo⁴ have recently surveyed the empirical studies of the consumption-earnings relationship in less developed economies. Although the empirical work is interested in testing the hypothesis that the poor tend to consume goods produced primarily by factors of production owned by the poor and the rich consume goods produced by factors owned by the rich, lack of data has heretofore made this impossible. These studies have used data on the consumption patterns of different income classes to determine how the composition of output would change given an

¹James W. Land and Ronald Soligo, "Income Distribution and Employment in Labor Redundant Economies," Program of Development Studies Discussion Paper no. 9, Rice University, Houston, 1971 (Mimeo.).

²One study which Morawetz does not include in this context is the ILO's Towards Full Employment, op. cit. We mention this study because it deals with Colombia as we do, and it recommends that the Colombian government redistribute income from the very rich to the poor, specifically hypothesizing that this will increase the earnings and employment of the poor.

³William R. Cline, "Distribution and Development: A Survey of Literature," Journal of Development Economics, I (1975), 359-400.

⁴Ronald Soligo, "Factor Intensity of Consumption Patterns, Income Distribution, and Employment Growth in West Pakistan," Program of Development Studies Discussion Paper No. 44, Rice University, Houston, 1973 (Mimeo.).

arbitrary redistribution of disposable income. If data on the distribution of value-added by income class were available for each producing sector, the change in output mix could be translated into changes in the size distribution of factor earnings. Since this data has not been available, studies have used sectoral capital-output and labor-output ratios to calculate the effects of the income redistribution on factor demand or data on the functional distribution of value-added to calculate the effects on the functional distribution of income in the aggregate.

Morawetz also points out that these studies omit a "final iteration" as the change in the size distribution of earnings, resulting from the initial change in the composition of output, further alters final demand and thus the composition of output again. This "final iteration" can either mitigate or reinforce the initial redistribution of income.

Knowledge of only the change in factor earnings or factor demand is particularly restrictive if the distribution of the ownership of capital differs between sectors. For example, sectors A and B may have the same capital-labor ratios, but sector A may be made up of many small firms with a fairly broad ownership of capital while sector B may have a few very large firms with a great concentration of the ownership of capital. An expansion of the A sector and contraction of the B sector will not directly affect the overall distribution of factor shares or factor demand, but they will tend to improve the size distribution of earnings.

In this study we are able to avoid such problems. From a closed 1968 Colombian input-output table developed by AID, we have data on both the uses and sources of income by products for the different income

groups in the Colombian economy. Thus, we are able to determine the full effect of the consumption earnings chain on the size distribution of income. The particular form of our test will involve inducing some purely hypothetical redistribution of income to the poor to determine whether or not there is a significant reinforcing rise in the employment and earnings of the poor.

Section 2

In this section we present our general algebraic model and show its use for our analysis. In the next section we discuss the data and the sectors of our specific Colombian model.

The following matrices make up the closed input-output model.

- A is an m by m input coefficients matrix. It is the standard Leontief coefficients matrix showing for each activity the inputs, per dollar of output, coming from each of the m activities.
- V is an r by m income coefficients matrix. It shows how much per dollar of output, each of the r household sectors earns from each of the m activities (i.e., it shows the value added accruing to each household from each activity).
- C is an m by r consumption coefficients matrix. This matrix indicates how much each of the r household sectors purchases from each of the m activities out of one dollar of income.
- S is an r by r services coefficients matrix showing the proportion of income each household group spends on direct purchases of the services of each other household group. Thus, this matrix also shows how much each household sector earns from the direct consumption of their services per dollar of income of the consuming household sector.
- E_x is an $m \times 1$ column matrix showing total exogenous demand (e.g., exports, government, etc.) for the output of the m activities.
- E_y is an $r \times 1$ column matrix showing total exogenous income payments to the r household sectors (e.g. earnings of government employees).

X is an m by 1 column matrix showing total output of each of the m activities.

Y is an r by 1 column matrix showing total income of each of the r household groups. Thus, Y shows the distribution of income among the household groups.

With these definitions we can write the two basic equations with which we are concerned:

$$AX + CY + E_x = X \quad (1)$$

and

$$VX + SY + E_y = Y \quad (2)$$

Equation 1 simply divides the total output of each of the m activities into that output used by the activities themselves as intermediate inputs (AX), output used for consumption (CY), and output used to meet exogenous demands (E_x). The second equation similarly divides each household group's income into that which it receives from the use of its factors in each of the m activities (VX), that which it receives from the direct consumption of its services by other household groups (SY), and exogenous income payments (E_y).

In the empirical section of this paper we use three income levels, designated as poor, middle, and rich and undertake an experiment whereby an income tax is levied on the factor earnings of the rich and the resulting income transferred to the poor. Methodologically, this tax-transfer process is handled in the following way. The ij^{th} element in V shows the income payments (value added) made to the i^{th} household group per dollar of output of the j^{th} activity. Let the first row in V correspond to the poor household group, the second row the middle income group, and the third row the rich group. Writing elements in V as v_{ij} we tax the

rich households by replacing v_{3j} with $v_{3j}(1-t)$ for all j where t is the tax rate. This puts a payroll tax on the earnings of the rich from all the m activities. To insure that the full tax revenues are redistributed to the poor we increase v_{1j} to $v_{1j} + tv_{3j}$ for all j . Note that this procedure leaves total value added per unit of output unchanged in each activity.

An identical procedure is followed in the S matrix so that income earned from services provided directly from one household group to another is also taxed. Similarly the elements in E_y must also be changed in the same manner.

As can be seen from equation (2), the "initial" effect of changing the V , S , and E_y matrices with such an income tax alters the distribution of disposable income summarized by Y . The distribution will be changed further as a result of "second round" effects. The initial change in Y alters the composition of final consumption demand, CY , in equation (1) which changes the composition (and magnitude) of X , changing VX and thus further changing the distribution of income.

In the rest of this section, we shall algebraically decompose the ultimate change in the distribution of income into the amounts of the actual taxes and subsidies payed and the "second round" change in factor earnings, the latter of which is further divided into that change induced by the change in the composition of intermediate demand and that induced by the change in the composition of final consumption demand.

Writing the value of the various matrices after a tax has been instituted with primes and before the tax without primes, we can write the change in the distribution of income as

$$\begin{aligned}
 Y' - Y &= V'X + S'Y' + E'_y - VX - SY - E_y \quad (3) \\
 &= (V' - V)X' + (S' - S)Y' + E'_y - E_y \\
 &\quad + V(X' - X) + S(Y' - Y).
 \end{aligned}$$

First let us consider the term $(V' - V)X'$. This is a column vector which, following our earlier example, has three elements. The first corresponds to the household group receiving a subsidy, the second to the group neither taxed nor subsidized, and the third to the group which is taxed. A typical column in the matrix $(V' - V)$ will be

$$\begin{aligned}
 &tv_{13} \\
 &0 \\
 &-tv_{13}
 \end{aligned}$$

The vector will be

$$\begin{aligned}
 &t \sum_{i=1}^m v_{i3} x_i \\
 &0 \\
 &-t \sum_{i=1}^m v_{i3} x_i,
 \end{aligned}$$

Thus, the third term in this vector shows the total tax paid by the rich from their earnings from the m activities and the first term shows the total subsidy paid to the poor from those taxes.

A completely analogous argument applies to the two vectors $(S' - S)Y'$ and $E'_y - E_y$. They show the taxes paid and subsidies received out of service income and exogenous income respectively. We shall write the vector sum $(V' - V)X' + (S' - S)Y' + E'_y - E_y$ as R ; its elements are the total subsidies received by the poor, and the total taxes paid by the rich.

Equation 3 may now be written as

$$Y' - Y = R + V(X' - X) + S(Y' - Y) \quad (4)$$

The last two terms on the right-hand side of this equation are the change in factor earnings which results when the tax is introduced.¹ Thus, equation (4) divides each group's change in (disposable) income into the tax or subsidy paid by that group and that group's change in factor earnings.

The tax subsidy scheme summarized in R shifts disposable income toward the poor. The hypothesis which we wish to test asserts that factor earnings will also shift toward the poor reinforcing the overall income distributional impact of the tax subsidy policy.²

We can provide an even more refined analysis of this hypothesis by separating the change in factor earnings into that resulting directly from the change in final consumption and that resulting from the change in intermediate input demand.³ From equation (1) we can write the change in total output as

$$X' - X = A(X' - X) + C(Y' - Y)$$

Substituting this into 4 we obtain

$$Y' - Y = R + VA(X' - X) + VC(Y' - Y) + S(Y' - Y) \quad (5)$$

¹We use the term factor earnings to mean pretax earnings, i.e., earnings out of which taxes are paid or to which subsidies are added.

²We are stating our hypothesis in a form very similar to that used by Seers (see ILO, *op. cit.*). We do this partially because Seers was dealing with Colombia and our data is on Colombia. However, as Georgescu-Roegen notes (see Roegen, *op. cit.*, page 593), his hypothesis on the consumption-earnings relationship implies the hypothesis which we shall test directly.

³This change in final consumption and intermediate input demand is primarily a change in the composition of final consumption and input demand. That is, the consumption of some goods (consumed primarily by the rich) falls while consumption of other goods (consumed by the poor) rises. However, there may be, and in fact using our Colombian data there is, a small rise in total consumption. This occurs if the poor tend to save and import less per dollar of income than the rich do; thus when a dollar is taken from the rich and given to the poor total domestic consumption rises.

Consider the vector $VC(Y' - Y)$. $Y' - Y$ is the change in each household group's disposable income. $C(Y' - Y)$, a vector, is the change in final consumption demand for the goods produced by the m activities. $VC(Y' - Y)$ then is the change in each household group's factor earnings due solely to the change in the final consumption of those goods. Analogously $S(Y' - Y)$ is the change in earnings due solely to the change in final consumption of the direct services of the different household sectors.

A similar argument can be applied to the vector $VA(X' - X)$. $X' - X$ is the change in the composition of total output of the m activities. $A(X' - X)$ is the change in the composition of intermediate input demand, and $VA(X' - X)$ is the resulting change in factor earnings.

Equation (5) then divides the change in each household group's disposable income into (1) the tax paid or subsidy received, (2) the change in factor earnings due to the change in the final demand for goods and personal services, and (3) the change in factor earnings due to the change in the intermediate demand for goods. Thus, we can separately determine if the consumption and earnings patterns directly and/or indirectly (i.e., through intermediate demand) reinforce the tax redistribution.

Section 3

The data we use for this study comes from a 1968 closed input-output model of Colombian economy developed by AID. The development of this model was actually a preliminary stage in a still continuing project to develop a larger, more accurate model. There are many shortcomings of the data used in the 1968 model which it is hoped will be corrected in the forthcoming model; however, for the present, the 1968 model has many advantages. In this section we will briefly describe the input-output table, noting its

particular advantages for our study and pointing out some of the data problems.¹

The sectors of the model are listed in the appendix. The first 45 sectors make up the activities in the A matrix. There are nine agricultural sectors, seventeen food processing sectors, ten merchandising sectors, and nine industrial and manufacturing sectors.

The next 26 sectors are the household sectors of the V matrix. The households are divided in three ways: (1) factor source of income (i.e., capital earnings, wage income, which we take as corresponding to unskilled labor income, and administrative and technical salaries, which we take as corresponding to skilled labor income); (2) sectoral source of income (i.e., agricultural or nonagricultural); and (3) the level of income. Though the size of income is broken down by five levels for most groups, Levels I and II and Levels III and IV are combined twice in the data. As a result, we can only really consider the three divisions by Levels I and II, Levels III and IV, and Level V. Levels I and II include those who earn up to \$1000(pesos) a month and make up approximately 70% of the work force; those in Levels III and IV make between \$1000 and \$3000 and are approximately 24% of the work force; and those in Level V earn above \$3000 and are approximately 6% of the work force.

The last five sectors make up the exogenous demand sectors. They provide both exogenous demand for goods and exogenous income payments. Virtually all of the exogenous income payments (E_y) come from the government services sector and represent payments to government employees.

¹The data are described in more detail in a series of working papers published by AID (see Samuel R. Daines et al, "Partial Implications of the Analysis for Decision-Making in the Agricultural Sector," Analytical Working Doc. #6, Sec. Analysis Division AID, November 1972 for complete bibliography).

For our purposes the most important aspect of these data is that we not only know how each of the income groups spends their income (i.e., we have the elements of the C and S matrix), but we also know from the production of what goods they earn their income (i.e., the elements of the V matrix). With these complete data on the sources and uses of income for each income class we are able to determine the full effects of the consumption earnings chain.

There are three principal shortcomings of the Colombian data. In contrast with some other studies of the consumption earnings relationship, our model is static.¹ There is no link between investment requirements and savings in the model.

The second problem is that the income distribution implied by the table is considerably more equal than that found in independent studies of the distribution of income. Most studies suggest that workers in Levels I and II earn about 32% of total income, while the input-output table shows that they earn 46% of total income.² Much of the discrepancy appears to come from the marketing and agricultural sectors. It is not clear what the source of the discrepancy in the marketing sector is.^{2a} The reason for the

¹Samuel A. Morley and Gordon W. Smith, "The Effect of Changes in the Distribution of Income on Labor, Foreign Investment and Growth in Brazil," Program of Development Studies Discussion Paper no. 15, Rice University, 1971.

²See, for example, R. Albert Berry, "Farm Size Distribution, Income Distribution and the Efficiency of Agricultural Production: Colombia," Proceedings of the American Economic Association, New Orleans, December 1971; and M. Urrutia Montoya and C.E. Villalba, "La Distribucion del Ingres Urbano para Colombia en 1964," Revista del Banco de la Republica (September, 1969).

^{2a}The distribution of value-added in the marketing sectors as given in the input-output table differs from that shown in official statistics. See DANE, Boletin Mensual de Estadistica, no. 237 (1971), 75.

discrepancy in the agricultural sector may be due to reliance on data from farms participating in a subsidized credit program in Colombia. These farms tend to be middle-sized and thus do not show the extremes of the *minifundia* and *latifundia*. Since our study deals primarily with the distribution of income and changes in it, this is a particularly important inconsistency.

Another shortcoming of the data which may be important is the use of average as opposed to marginal consumption coefficients. Effectively, our analysis assumes that each group spends an extra dollar in the same manner as average expenditures per dollar for that group. To the extent that a rise (fall) in total income for a particular income class is due to there being more (less) workers in that class, average consumption coefficients may be preferable to marginal coefficients. But, if there is a general rise in income for existing members of an income class, and marginal consumption coefficients differ markedly from average coefficients, then the use of average coefficients can introduce some error into the analysis.

Of course, one can attempt to estimate plausible marginal consumption coefficients from the average coefficients for the different income groups. However, with really only three different income groups such a procedure is not very convincing. As a result, we chose to simply employ the average coefficients of the AID data.

Beyond these specific limitations of the Colombian data, the general deficiencies of input-output models, of course, apply to our analysis. Thus, for example, we must assume that the supply of all factors of production are infinitely elastic and changes in relative prices do not affect demand. If we sought to obtain precise quantitative calculations of the

effect of the consumption-earnings chain on the distribution of income such deficiencies would be critical. However, since we only wish to determine whether or not the consumption-earnings chain significantly reinforces the redistribution of income, these strong assumptions, though important, are not crippling.¹

Section 4

The tax-subsidy scheme which we consider places a ten percent income tax on the richest subgroup (Income Level V) and transfers the proceeds to the poorest two groups, Income Levels I and II. Table 1 below shows the aggregate effects of this tax on factor and disposable income.

TABLE 1

	Change in disposable income	%	Change in factor income	%
Levels I & II	3,549,461	9.4	417,107	1.0
Levels III & IV	283,430	1.5	283,430	1.5
Level V	2,558,827	-8.3	574,426	1.9

The tax, as expected, causes a large shift in disposable income from the richest to the poorest groups. That redistribution causes the composition of final consumption demand to reflect the consumption bundles of the poor to a greater extent than previously. Our interest is whether or not

¹In discussing our results we shall consider the implications of dropping these restrictive assumptions.

the shift in demand will cause the factor earnings of the poor to rise relative to the rich. Table 1 shows that not only is there no substantial shift in factor earnings toward the poor reinforcing the shift in disposable income, but in fact the factor earnings of the rich rise more than those of the poor. As a result, the distribution of earnings shifts toward the rich.

This result is somewhat masked by the fact that each income group's factor earnings rose indicating a rise in total national income. The tendency of the rich to import and save more out of a dollar of income than the poor means that as disposable income is redistributed from the rich to the poor, total domestic consumption rises causing the rise in national income (see footnote 3, page 9). Because capacity limitations in the short run may not allow total national income to rise, we can adjust our figures by deflating each income group's rise in income by the general rise in income. Making this adjustment, the "real" factor earnings of the poor (Levels I and II) fell by .4 percent while Level III and IV rose by .2 percent, and Level V by .5 percent.

Since our results do not show any tendency for the tax-subsidy program to induce a reinforcing shift in factor earnings, we cannot confirm the hypothesis that the poor consume a bundle which generates more earnings for the poor than does the bundle consumed by the rich. To get a better idea of exactly why such a hypothesis is not confirmed we disaggregate our results to show the change in factor earnings for each of the 26 income-factor subgroups and, following the analysis of Section 2, we divide each group's change in factor earnings into that induced by the change in the demand for final goods and services and that induced by the change in intermediate demand. This disaggregation is shown in Table 2; all results are

TABLE 2

	(1) Percent change in factor income (F.I.)	(2) Percent change in factor income due to consumption demand	(3) Percent change in factor income due to intermediate demand
Ag. Wages I	2.4	1.6	.8
Ag. Wages II	2.5	1.7	.8
Ag. Salaries I	2.7	1.7	1.0
Ag. Salaries II	2.8	1.7	1.1
Ag. Prop. Inc. I	3.0	2.2	.8
Ag. Prop. Inc. II	3.0	2.2	.8
Non Ag. Wages I	-2.3	-2.6	.3
Non Ag. Wages II	-1.7	-2.1	.4
Non Ag. Sal. I & II	2.1	1.7	.5
Non Ag. Prop. Inc. I & II	2.7	2.2	.4
Total I & II	<u>1.0</u>	<u>.5</u>	<u>.5</u>
Ag. Wages III	2.7	1.9	.9
Ag. Wages IV	2.6	1.8	.8
Ag. Salaries III	2.8	1.7	1.1
Ag. Salaries IV	3.0	1.8	1.1
Ag. Prop. Inc. III	3.0	2.2	.8
Ag. Prop. Inc. IV	3.0	2.2	.8
Non Ag. Wages III	- .3	- .7	.4
Non Ag. Wages IV	-1.3	-1.7	.5
Non Ag. Sal. I & II	1.7	1.3	.4
Non Ag. Prop. I & II	2.2	1.7	.5
Total III & IV	<u>1.5</u>	<u>1.0</u>	<u>.5</u>
Ag. Wages V	1.5	1.0	.5
Ag. Salaries V	2.8	1.7	1.1
Ag. Prop. Inc. V	2.9	2.1	.8
Non Ag. Wages V	-1.2	-1.3	.2
Non Ag. Sal. V	1.9	1.4	.5
Non Ag. Prop. V	1.7	1.3	.4
Total V	<u>1.9</u>	<u>1.4</u>	<u>.5</u>

shown as percentage changes and are not adjusted for the rise in national income.

The most striking result highlighted by this disaggregation is the sharp drop in income payments to nonagricultural wages Level I and II. This group gets 48% of its income from the sale of their services directly to other (mostly rich) income groups. Presumably these are personal services such as maids, chauffeurs, etc. The rich spend around 17 percent of their income on such services while the poor spend only .7 percent. As a result, the redistribution of income from rich to poor greatly decreased the consumption of these services. (That reduction also implies a significant fall in the employment of service workers.)

The fall in the earnings of service workers is the major determinant of the relative decline of factor earnings of the poor. (When service workers are excluded, poor people's income rises by 2.3%.) However, an examination of the column reflecting the change in factor income due to the change in the composition of consumption demand (column 2) suggests that even ignoring service workers (they are included solely in the nonagricultural wages category) the poor do not consume a bundle which generates significantly more income for the poor than the bundle consumed by the rich. For example, while Ag. Wages I and II rose by 1.6% and 1.7% respectively, Ag. Wages V rose by 1.0%. Similarly, Agricultural Salaries, Agricultural Property Income, and Nonagricultural Salaries rose approximately the same for the very rich and the very poor. Though the percentage rise in Nonagricultural Property Income of the poor was more than that of the rich, still it is striking that as the aggregate consumption bundle came more to reflect poor people's consumption patterns, wealthy nonagricultural property owners (Nonagricultural Property V) saw their earnings rise by 1.3%. (There would be no

change in the "real" earnings of this group if we adjusted these figures for the rise in aggregate income.)

A little more disaggregation is necessary to see why, even disregarding service workers, there is no strong reinforcing redistributive effect. As might be expected, the redistribution of disposable income raised consumption demand for food in general. The increase in consumption of the following seven goods made up approximately 68% of the total dollar increase in consumption:

- 1) Potatoes and beans
- 2) Dairy products and meat
- 3) Baking of bread
- 4) Manufacture of alcoholic and non-alcoholic beverages
- 5) Marketing of meat
- 6) Marketing of Bakery goods
- 7) Marketing of beverages

For the whole economy the poor receive about 46% of total income, but they receive approximately 60% of the income from the three marketing activities listed above and from the growing of potatoes and beans. Thus, the large increase in the consumption of these goods would have the effect of shifting the distribution of earnings sharply toward the poor. The distribution of earnings from dairy products and meat production is about the same as the overall distribution so that the rise in consumption of these goods would have a relatively neutral effect. On the other hand, the baking of bread and the manufacture of beverages pay 60% and 94%, respectively, of their value-added to the rich (Level V). The rise in consumption of these goods provides a counterforce to the tendencies induced by the rise in the marketing and agricultural products.

Consequent upon the redistribution of disposable income, aggregate consumption of the following six goods fell:

- 1) Preparation of fish and sardines
- 2) Manufacture of wood, lumber, and paper
- 3) Tires and rubber production
- 4) Manufacture of wood furniture
- 5) Light metal industries
- 6) Heavy metal industries

Of these goods, the first five do, in fact, provide disproportionate income to the rich and thus the reduction in their consumption would twist factor earnings toward the poor. However, none of these have as high a proportion of their value-added going to the rich as the manufacture of beverages does and, further, over 50% of the value-added in heavy metal industries go to the poor (primarily low income urban wages and salaries).

The above discussion examined only 13 of the 35 final consumption goods in our model; however, it is sufficient to indicate that while the shift in consumption is away from manufactured goods and toward food, the rise in the output of the food preparation industries generates considerable income for the rich, and the fall in some manufacturing industries causes a large reduction in the income of poor workers. The net effect shown in Tables 1 and 2 is to slightly shift the distribution of factor earnings toward the rich.

We have concentrated on the effect the shift in final consumption had on earnings. As can be seen from Table 2, the change in the level and composition of intermediate demand increased the income of each of the three income groups by .5% and thus had a neutral effect on the distribution

of income. Interindustry production relationships apparently have little effect in changing the distribution of income.

The consumption-earnings hypothesis we are testing often asserts that the reinforcing effect of a transfer will help to alleviate the unemployment problem.¹ If one assumes that wage rates are constant and are the same between sectors, then our changes in earnings results can be used to suggest the effect of the tax scheme on employment. In this context our results are even less supportive of that hypothesis. All of the fall in the earnings of service workers implies a fall in employment; however, only part of the rise in poor people's income in other sectors comes from labor income--part of it is property income. Total labor income of the poor rose only .6%, indicating a small increase in employment. At the same time, total capital earnings for all income groups rose 2.2%

One final aspect of this redistribution scheme worth noting is its effect on the sectoral distribution of income. The changes in the sectoral distribution of income and changes in the size distribution of income within the sectors are summarized in Table 3. Consistent with a pattern noted by Kuznets,² the distribution of income in agriculture is less skewed than that within the nonagricultural sector. However, even though the share of factor income in agriculture rises where it is more equally distributed, the overall distribution of factor earnings worsens. As can be seen from Table 3, this is because the distribution of income within both the agricultural and non-agricultural sectors worsens.

¹This is precisely the concern in the ILO study for Colombia. See International Labour Office, Towards Full Employment (Geneva: ILO, 1970).

²Simon Kuznets, "Economic Growth and Income Inequality," American Economic Review (March, 1955).

The worsening of the distribution within the nonagricultural sector occurs largely because of the fall in the earnings of low income service workers, which we have discussed. The very slight worsening of the distribution of income within agriculture is largely due to the increased production of meat and dairy products. Those products showed the largest increases in production of the nine agricultural goods. Meat and dairy production is the most capital/land intensive output in agriculture (88% of value-added in such production goes to property) and land holdings are concentrated in the hands of the rich. As a result, total payments to property in agriculture rose more than total labor payments (3% vs. 2.5% respectively), and the distribution of income within agriculture worsened.¹

TABLE 3

	Before Tax <u>earning share</u>		<u>% Change in earnings</u>	After Tax <u>earning share</u>	
	<u>Inter- sectoral</u>	<u>Intra- sectoral</u>		<u>Inter- sectoral</u>	<u>Intra- sectoral</u>
Agriculture	22%		2.8%	23%	
Level I & II		53.2%	2.7		53.1%
Level III & IV		25.0	2.9		25.0
Level V		21.8	2.9		21.9
Non-Agriculture	78		1.0	77	
Level I & II		45.0	.4		44.0
Level III & IV		19.0	1.0		19.0
Level V		36.0	1.7		37.0

¹We noted earlier that the distribution of earnings from meat and dairy production is approximately the same as the overall distribution of earnings. This means that the distribution of earnings from meat and dairy production is more skewed than the overall distribution of earnings in agriculture.

Section 5

The results of this study provide little support for the hypothesis that the poor tend to consume goods and services produced with factors of production owned primarily by the poor while the rich consume goods and services produced with factors owned by the rich. Rather, it appears that a unit of expenditure by any of the three income groups has roughly the same impact on the distribution of income. Differences which do show up work perversely so that expenditures by the poor tend to increase factor earnings by the rich more than those of the poor and vice versa. Thus, the "second round" effects of a change in the distribution of income induced by a tax-transfer scheme are small and work in the opposite direction from the initial redistribution.

This conclusion is at variance with the results of studies for Colombia and other countries which have calculated the effect of a tax-transfer scheme on factor demand. Those studies consistently show that a redistribution of income toward the poor would significantly increase the demand for labor and reduce the demand for capital.¹ An increase in employment is usually associated with an increase in the share of income going to labor and, given the usual skewness in the distribution of capital relative to labor, an increase in the degree of distributional equity. Yet the results of this paper are that the distribution of factor earnings are little affected by a redistribution of income.

¹These results have been summarized by Soligo in his "Consumption Patterns, Factor Usage and the Distribution of Income: A Review of Some Findings," paper presented at the 1974 Meetings of the Southern Economic Association, Atlanta, Georgia, November 14-16, 1974.

Aside from problems associated with the reliability of the data, there are at least two other factors which may account for the different results from the two types of studies. First, studies which have looked only at factor demand have typically used a highly aggregated services sector while the input-output table used in this study separates out personal services. Thus, differences in employment which result from the differential consumption of personal services by income class are not picked up in other studies. As this paper shows, this factor is an important one and, in fact, is the primary offset to increases in employment generated in other sectors. Second, because of the existence of wage differentials, changes in employment may not be correlated very strongly with changes in labor earnings. Increases in employment following redistribution occur in the agricultural sector, since the poor spend a much higher proportion of their income on food than the rich. Employment in manufacturing and personal services provided to the rich decrease. Typically, agricultural wages are significantly below urban sector wages in general and wages paid in manufacturing and for personal services in particular.

Finally, in assessing the relevance of the results of this paper for income distribution-oriented policies it is important to remember that the results reflect the effects of a tax-transfer scheme on the distribution of factor earnings given the distribution of factors, especially wealth, among the different income groups. Policies which attempt to alter the distribution of income by changing the distribution of wealth will have different effects. For example, if the distribution of land ownership were changed in favor of the poor, the second round effects of this policy would reinforce the initial change. In this case, the increased expenditure by the poor which

results from their higher incomes would generate a larger increase in the earnings of the poor from their now larger wealth holdings in addition to the increase in labor earnings from increases in employment. This qualification is a very important one since the methodology of this and other papers takes as given consumer expenditure patterns and factor input coefficients (technology) as well as the distribution of wealth, while the objective of policy may be to change any or possibly all of these.

Appendix

Agricultural Sectors

Coffee and Beans
Fruits
Vegetables
Sugar and Potatoes
Meat and Dairy Products
Soybeans and Sesame
Cereals
Cotton
Seeds

Merchandising Sectors

Merchandising of Meat
Merchandising of Bread
Merchandising of Dairy Products
Merchandising of Fruits
Merchandising of Liquor and Cigarettes
Merchandising of Coffee
Merchandising of Automobiles, Hardware,
Fuels, and Other Products
Merchandising of Agricultural Products
Merchandising of Agricultural Inputs

Food Processing Sectors

Prepared Meat
Processing of Dairy Products
Processing of Fruits
Preparation of Fish
Milling of Cereals
Making of Breads
Processing of Sugar
Processing of Fats
Preparation of Starches
Manufacture of Coffee
Manufacture of Beer and Liquor
Manufacture of Cigarettes

Industrial Sectors

Manufacture of Wood and Paper
Manufacture of Leather
Manufacture of Rubber Products
Manufacture of Oil
Manufacture of Agricultural Machinery
Agricultural Transportation
Textiles
Furniture and Printing
Chemical Manufacturing
Heavy Metal Industries
Light Metal Industries
Utilities and Non-Agricultural Transportation

Exogenous Sectors

Government
Foreign
Change in Inventories
Other Inputs N.E.C.
Capital

Household Sectors

Ag. Wages Level I
Ag. Wages Level II
Ag. Wages Level III
Ag. Wages Level IV
Ag. Wages Level V
Ag. Salaries Level I
Ag. Salaries Level II
Ag. Salaries Level III
Ag. Salaries Level IV
Ag. Salaries Level V
Ag. Property Income Level I
Ag. Property Income Level II
Ag. Property Income Level III
Ag. Property Income Level IV
Ag. Property Income Level V
Non-Ag. Wages Level I
Non-Ag. Wages Level II
Non-Ag. Wages Level III
Non-Ag. Wages Level IV
Non-Ag. Wages Level V
Non-Ag. Salaries Levels I & II
Non-Ag. Salaries Levels III & IV
Non-Ag. Property Income Level V

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