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THE BUDGETARY IMPLICATIONS OF REDUCING U.S. INCOME INEQUALITY THROUGH INCOME TRANSFER PROGRAMS

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ABSTRACT

In this paper, we have recognized that the relatively constant inequality in the distribution of U.S. family income masks dramatic changes in the structure of the income distribution and the composition of personal incomes. Using relatively new procedures for decomposing the Gini measure of income inequality, we have gained a better understanding of the relationships among changes in the sources of income and the income distribution. This is facilitated through the use of data collected by the Census Bureau in the Survey of Income and Program Participation, which is the only set of data currently available that contains exhaustive lists of income and asset information at the household level. The empirical results are used in conjunction with data on transfer program expenditures to gain some perspective on the relative costs of reducing income inequality by increasing program benefits.

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THE BUDGETARY IMPLICATIONS OF REDUCING U.S. INCOME INEQUALITY THROUGH INCOME TRANSFER PROGRAMS

The relatively constant inequality of the distribution of U.S. family income since World War II masks dramatic changes in the structure of the income distribution and the composition of personal incomes over the same period. It also obscures the fact that changes in sources of income may affect changes in overall income inequality quite differently and alter the positions of various socioeconomic groups along the distribution. Gaining a better understanding of the relationships among changes in the sources of income and the income distribution, income inequality, and the well being of various socioeconomic groups is important for informing public policy. A methodology for understanding such relationships is developed and calibrated in the research reported in this bulletin. The empirical results are used in conjunction with data on transfer program expenditures to gain some perspective on the relative costs of reducing income inequality by increasing program benefits.

BACKGROUND

Although the inequality in U.S. family income is large and has remained relatively constant over the post-war period, Levy (1987) argues that this period has been marked by three distinct trends. The drift toward equality through the late 1960's was followed by a drift away from equality through the 1970's, and a slightly sharper increase in inequality during the 1980's. This most recent trend is symptomatic of what some fear are fundamental changes in the economy leading to a vanishing middle class brought about by a decline in the number of middle-income manufacturing jobs and the emergence of a two-tier job structure consisting of a few high-paying jobs and many low paying ones in a growing service sector.

The post-War period can also be divided into two distinct economic periods -- a 27-year boom in which inflation-adjusted wages grew by several percentage points per year and the period since 1973 in which real wages have stagnated (Levy, 1987). Despite the fact that this latter period is characterized by only a modest increase in overall income inequality, the stagnation in real wages has lead to major rearrangements in the structure of the distribution. Incomes of many elderly have risen, while those of younger families have moved down. A growing proportion of children are being raised in poverty. Regional income differentials have narrowed (Betson and Haveman, 1984), while city-suburban differentials have become larger.

The composition of incomes has changed dramatically as well. There are more households and families with more than one wage earner. More people, both young and old, rely on government transfer programs for a substantial portion of their income. Returns from property are also important components of income for many others. In 1960, for example, wages and salaries constituted 68 percent of total personal income in the United States; property and rental income was 15 percent of the total (U.S. Department of Commerce, 1980). In that same year, dividends and interest, and transfer payments were 9 and 7 percent of the total, respectively. By 1970, the first year of the drift toward increased inequality, there was little change. Wages and salaries constituted 66 percent of average total personal income. Property and rental income had fallen to just under 12 percent of the total, while dividends and interest, and transfer payments had risen to 11 and 10 percent of the total, respectively (U.S. Department of Commerce, 1987).

In 1986, the latest year for which data are available, the situation is quite different. Wages and salaries as a percentage of total personal income had fallen by 9 percentage points relative to 1960. Property and rental income constituted just under 9 percent of the total, while that attributed to dividends and interest rose to over 16 percent. The proportion of income coming in the form of transfer payments was more than double the level for 1960 (U.S. Department of Commerce, 1987).

To begin to sort out the relationships between changes in the composition of personal income and total income inequality, the Gini coefficient, a measure of overall income inequality, is decomposed into the proportions due to the various major sources of income (Lerman and Yitzhaki, 1985). While this decomposition is not intended to explain the economic forces that gave rise to the changing composition, it is useful for describing how the distribution would change due to a marginal change in any major source of income. Such comparisons are more meaningful in a policy context than asking what happens to inequality by recalculating the Gini index after eliminating a particular source of income altogether.

To obtain deeper insights into the importance of income by source, a further (second level) method for decomposing the major sources into their respective component parts is designed. Special attention is also given to an extended Gini index which can reflect increased social aversion to inequality. To accomplish these Gini decompositions and extensions, a special purpose FORTRAN program was written; the source code and the program's documentation are contained in two appendices.

The data used in the analysis are from the Survey of Income and Program Participation (SIPP). This data set, the result of a major new effort by the Census Bureau, contains comprehensive income and asset information and is ideal for purposes of this analysis, which is an initial step in a more comprehensive research program designed to construct a framework for evaluating the effects of policy changes in transfer programs on the incidence of poverty in rural America and on the rural-urban poverty gap.

The remainder of this report begins with a general discussion of inequality measurement and a summary of the algebra of the first and second levels of decomposition. This is followed by a description of the data and a discussion of some summary statistics. The results of the decomposition are then followed by a discussion of the budgetary implications of reducing income inequality through Federal transfer programs. Finally, a statement of the major conclusions and policy implications is provided.

MEASURING INEQUALITY

The Gini coefficient, usually defined as the ratio of the area between the Lorenz curve (which represents the fraction of total income possessed by the holders of the smallest p^{th} fraction of income) and the area under a 45^{o} line (Gastwirth, 1972), has been one of the most widely used measures of inequality in economic analysis. As such, it has been the subject of much criticism as well, the most serious being that for income distributions with the same mean, it is impossible to find an additive social-welfare function that ranks distributions by their Gini coefficients (Chipman, 1985). This type of criticism can be levelled at most rankings based on only two parameters of the distribution; and at a theoretical level, what is needed is a multivariate measure that accounts for the heterogeneity of contemporary populations.

Despite this criticism, Lerman and Yitzhaki (1985) and others argue that the Gini index remains an important tool for examining income distribution. Their argument is based on the facts that: a) Gini measures and the mean permit one to form the necessary conditions for stochastic dominance, b) an extended Gini index can be used to reflect increasing social aversion to inequality in much the same way as Atkinson's (1970) index of inequality, c) both the Gini and the extended Gini can be decomposed, yielding an intuitive interpretation of the elements making up each source's contribution to inequality, and d) the decomposition allows one to examine the marginal change in income by source on overall inequality.

This latter point is particularly attractive because despite one's inability to find additive social welfare functions consistent with a "mean-Gini" ranking, more general multivariate formulations still lead to social welfare functions whose partial derivatives are positive with respect to the mean and negative with respect to the Gini (Cumming, 1983, cited in Chipman, 1985). Thus, *ceteris paribus*, changes in any particular Gini coefficient due to marginal changes in income by source can be interpreted unambiguously.

Gini Ratio and Its Decomposition

Although the Gini coefficient is usually defined in relation to the Lorenz curve, Lerman and Yitzhaki (1985) demonstrate that it can also be derived directly from the formula for Gini's mean difference:

$$(1) \quad A = \int_a^b F(y)\ [1-F(y)]dy,$$

where y is income ($a \leq y \leq b$) and F(y) is the cumulative distribution. Through integration by parts and variable transformations, they show:

(2) $A = 2 \operatorname{cov}[y, F(y)]$.

The Gini index (G) is then formed by dividing A by mean income, μ_y.

In most applications, the Gini ratio is thought to be bounded by zero and one. This is true only when all incomes are positive. However, Gastwirth (1972) shows that the Gini ratio is still defined when some incomes are negative but mean income remains positive. Then, the bounds on the Gini range from $0 \leq G \leq (\mu-a)(b-\mu)/\mu(b-a)$ and comparisons across populations become more difficult because the base is no longer unity. Boisvert and Ranney (1990) provide a complete discussion of this issue, but it should not be a problem in this application.

Letting $y_1, \ldots, y_K$ represent sources of income such that $y = \sum_k y_k$, one can use the properties of the covariance of the sum of random variables (Mood *et al.*, 1974) to write:

(3) $A = 2 \sum_k \operatorname{cov}(y_k, F(y))$.

Dividing (3) by μ_y and multiplying and dividing each component by $\operatorname{cov}(y_k, F(y_k))$ and μ_k yields the Gini decomposition on total income:

$$(4) \quad G = \sum_k [\operatorname{cov}(y_k, F(y))/\operatorname{cov}(y_k, F(y_k))] \cdot [2 \operatorname{cov}(y_k, F(y_k)/\mu_k] \cdot [\mu_k/\mu_y]$$
$$= \sum_k R_k G_k S_k,$$

where R_k is the correlation between y_k and the cumulative distribution of y, G_k is the Gini for y_k, and S_k is y_k's share of y. Pyatt *et al.* (1980) prove that $-1 \leq R_k \leq 1$ and R_k takes on its extreme values when an income source is a decreasing (-1) or increasing (+1) function of total income and is zero if y_k is a constant.

To determine the change in inequality due to a marginal change in y_k, Lerman and Yitzhaki (1985) consider a change in each person's income from source k equal to $e_k y_k$ where, e_k is close to 1. Then, as proven by Stark *et al.* (1986), the partial derivative of (4) with respect to e_k is:

(5) $\partial G/\partial e_k = S_k(R_k G_k - G)$

and in elasticity terms:

(6) $[\partial G/\partial e_k]/G = [S_k G_k R_k/G] - S_k$.

These elasticities sum to zero because a proportional increase in income from all sources would leave income inequality unaffected.

The Extended Gini Measure of Inequality

Yitzhaki (1983) derives an extension of the Gini index defined as:

(7) $G(v) = 1 - v(v-1) \int_0^1 (1-F(y))^{v-2} L(F(y))dF$,

where L(F(y)) is the Lorenz curve. This extension includes a parameter v reflecting a relative social preference for equality. By changing v, one changes the weight attached to each point on the Lorenz curve. The weight is given by $v(v-1)(1-F(y))^{v-2} = w$. Values of v between zero and one reflect social aversion to equality; v=1 reflects equality neutrality and $v > 1$ indicates inequality aversion.

By differentiating w with respect to F(y),

(8) $\partial w/\delta F(y) = -v(v-1)(v-2)(1-F(y))^{v-3}$,

one can see that when v=2, the weights are independent of income rank. This yields the standard Gini index where everyone is weighted equally. For $1 < v < 2$ and $v > 2$, the weights increase and decrease, respectively, as incomes rise. Thus, when $v > 2$, the index reflects relatively more social concern for those at the lower end of the income distribution.[1]

The decomposition of the extended Gini $G(v)$ is:

(9) $$G(v) = \sum_k R_k(v) G_k(v) S_k,$$

where,

(10) $$R_k(v) = \mathrm{cov}[y_k(1-F(y))^{v-1}]/\mathrm{cov}[y_k(1-F(y_k))^{v-1}]$$ and

(11) $$G_k(v) = -v\ \mathrm{cov}[y_k,(1-F(y_k))^{v-1})]/\mu_k.$$

Additional Levels of Decomposition

Further insights into the importance of income by source to total income inequality can be obtained through additional levels of decomposition. In their original study of the decomposition of income, Lerman and Yitzhaki (1985), for example, examined several major sources of income. These included wages, transfer payments and property income. However, as stated in the introduction, each of these sources can be decomposed as well. From a policy perspective, it may be as important to identify the effects of these components on the distribution of some major aggregates as it is to understand the effects of changes in these major components on total income inequality.

This can be accomplished through a second or even higher level of decomposition. In what follows, only a second-level decomposition is outlined. Higher levels of decomposition are a logical and obvious extension of this analysis. In developing the original decomposition, y_k represents

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Shalit and Yitzhaki (1987) show that in the case of discrete distributions with K observations, the rank of the observation, y_i, less 0.5 divided by K should be used as an estimator of the cumulative distribution $F(y_i)$: $F(y_i) = [\mathrm{Rank}(y_i) - 0.5]/K$, and $Z_i = [(K + 0.5 - \mathrm{Rank}(y_i))/K]^{v-1}$ is an estimator of $[1 - F(y_i)]^{v-1}$. In the FORTRAN code reported in Appendix B, this notion is generalized to accommodate grouped data.

the k^{th} source of income. Letting y_{kj} be the j^{th} component of the k^{th} source of income, we can write $y_k = \sum_j y_{kj}$; and $y = \sum_k y_k = \sum_k \sum_j y_{kj}$. In this case, $k=1...K$, and for each k, $j = 1 ... J_k$.

Once each source of income has been decomposed further into its several separate components, the second level of decomposition of the Gini measure of inequality is derived by recognizing that the Gini of income source k, the second term in brackets in equation (4), can be rewritten as

(12) $$2 \text{ cov } (y_k, F(y_k)/\mu_k =$$

$$\sum_j \left[\frac{\text{cov } (y_{kj}, F(y_k))}{\text{cov } (y_{kj}, F(y_{kj}))} \right] \bullet \left[\frac{2 \text{ cov } (y_{kj}, F(y_{kj}))}{\mu_{kj}} \right] \frac{\mu_{kj}}{\mu_k}$$

Extending the notation used in equations (1) through (6) in an obvious way, one can substitute equation (12) into equation (4) and obtain

(13) $$G = \sum_k R_k \, [\sum_j R_{kj} \, G_{kj} \, S_{kj}] S_k.$$

Thus, the Gini measure of income inequality for source k is the sum across the J_k components of source k of the products of the correlation between component j, y_{kj} and the cumulative distribution of y_k, the Gini of component j and the component j's share of y_k. A similar argument leads to a second-level decomposition of the extended Gini index.

By substituting equation (12) into equation (5), the partial derivative of (4) with respect to e_k can be rewritten as:

(14) $$\partial G/\partial e_k = S_k \, (R_{kj} \, [\sum_j R_{kj} \, G_{kj} \, S_{kj}] - \sum_k R_k \, [\sum_j R_{kj} \, G_{kj} \, S_{kj}] S_k).$$

In the elasticity terms this becomes:

(15) $$[\partial G/\partial e_k]/G = \{S_k \, [\sum_j R_{kj} \, G_{kj} \, S_{kj}] / \sum_k R_k \, [\sum_j R_{kj} \, G_{kj} \, S_{kj}] S_k\} - S_k.$$

THE DATA

To accomplish the research objectives using this framework, we must gain access to household-level data which include detailed socio-economic data, as well as data describing participation in and the benefits derived from numerous transfer programs. Until quite recently, such a data set did not exist, but as Long *et al.* (1986) point out, the Survey of Income and Program Participation (SIPP), a major new effort conducted by the Census Bureau, has enormous potential. From the standpoint of this research, SIPP is the only data set currently available that contains exhaustive lists of income and asset information, both of which are essential for identifying income by source and for determining means-tested transfer program eligibility. In addition to earnings and self-employment income data for all adult members of a household, SIPP contains income data from a list of 56 sources, many of which are government programs, pension funds and other public and private sources. There is an asset list of 13 items from which income may be derived, as well as a list of 16 special indicators (e.g. disabled, student loans, Medicare, etc.) which also are associated with income flowing to one or more members of a household (U.S. Dept. of Commerce, 1989; Long *et al., 1986*).

In addition to SIPP's wealth of socioeconomic data, the structure of the survey allows the researcher tremendous flexibility. SIPP is a multi-panel longitudinal survey of persons 15 years old or older. Data are also collected on all other persons who live with or move in with members of the original sample. One can obtain cross-sectional views of respondents at one point in time as well as longitudinal views of changes in economic circumstances and household composition over time.

For the first panel, the 1984 Panel (initiated in October 1983), a nationally-representative sample of households in the civilian non-institutionalized population was selected and the adults in 19,878 households were interviewed. Subsequently, additional panels have been initiated in February of each calendar year. For persons selected into the first SIPP panel, monthly economic and demographic information were collected over a three-year period. The subsequent panels cover two years and eight months. The panels are divided into four nationally-representative subsamples or rotation groups. Each rotation group is interviewed in a separate month with a complete cycle, or wave, completed after four months. At every interview, questions are asked regarding each of the four months since the previous interview.[2]

For the analysis reported herein, we have chosen a cross-section from the fourth month of the third wave of the 1984 Panel. That is, we have abstracted data for the month prior to the month of the third wave interview. Depending on the rotation group, the data relate to the months of May, June, July, or August 1984. At that time, there were 18,941 households interviewed.

SIPP's use of mutually exclusive panels also provides several advantages for the long-term objectives of this research. It will ultimately accommodate the replication the decomposition of household income reported here for at least two points in time, three to four years apart. To the extent that general economic conditions have changed over this period, the effects of these changes on income inequality can then be isolated.

Although SIPP is close to an ideal set of data for examining income inequality by source and participation in transfer programs, the public

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[2] For more information, see SIPP Users Guide (1987).

use data, which heretofore have been generally available through the Poverty Institute at the University of Wisconsin, will in the future be accessible only through a public use work station at the Bureau of the Census. In order to meet our broader objectives of decomposing income inequality by source for two important geographic subsamples of households--metropolitan and non-metropolitan, we have had to make special arrangements with the Bureau of the Census. Within the public use data, a special metropolitan subsample is identified, but, to guard against disclosure non-metropolitan households are identified only in the most populous states. Analyzing the behavior of non-metropolitan households from these states alone could generate an incorrect picture of inequality in rural areas and lead to inappropriate policy conclusions because households in predominantly rural states would be excluded. Therefore, in order to decompose income inequality in rural areas, we have gained the assistance of the Bureau of the Census in identifying a "rural" sample in such a way as to protect the confidential nature of the data. From this perspective, the analysis reported in this bulletin for the entire United States can be viewed as experimental and the first step in our plan toward a more complete understanding of the differences in income inequality by income source across metropolitan and non-metropolitan areas. We hope to complete that work by Spring 1992.

EMPIRICAL RESULTS

The empirical results from the analysis of the decomposition of U.S. household income for 1984 are reported in several tables in this section; additional detail is provided in Appendix C. The five major sources into which income was decomposed include: a) earned income; b) property income; c) transfer income; d) other money income; and e) non-money income. The latter three sources were decomposed further into several categories which are delineated in table 1. The two important components of transfer income are Supplemental Security Income (SSI) and AFDC, Aid to Families with Dependent Children. Social Security (SOC), State unemployment compensation, and veterans' benefits are the important components of other money income, while food stamps comprise the single most important component of non-money income.

Sample Averages

In the survey month in 1984 to which the data apply, average total household income in the United States was just under $2,178. On average, nearly $1,700 (or 78 percent) was in the form of earned income (table 1). Other money income was the second most important source, accounting for slightly over 14 percent of the total. Property income averaged $146 and was approximately 7 percent of the total, while transfer income was 1.1 percent and non-money income was 0.5 percent of the total on average.[3]

Although not directly comparable, the composition of household income by major income source is generally consistent with the figures mentioned in the introduction. Any major differences are easily explained by how the various income sources were constructed. For example, the earned income category constructed from the SIPP data includes income from sources other than wages and salaries. Thus, it is not surprising that it accounts for three-quarters of mean household income. (Earned income in March 1981 from the Current Population Survey (CPS) as reported by Lerman

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[3] For both property income and other money income, there were a small number of negative observations. In general, these could lead to an underestimation of the income inequality, but in this case, the effect was insignificant. If it had been important, the income decomposition could have only been accomplished by simulating income changes (see Boisvert and Ranney, 1990).

Table 1. Sources of Monthly Household Income For the United States, 1984

Source	Mean[a]	Description
Earned Income	$1,688 (77.5)[b]	Earnings from all sources (including self-employment income) by all members of the household
Property Income	146 (6.7)	Property income from all people in the household
Transfer Income	25 (1.1)	Means tested cash transfers to all members of the household
SSI	[33.9][c]	Supplemental Security Income from both Federal and state sources
AFDC	[45.7]	Aid to Families with Dependent Children (AFDC, ADC)
Other	[20.4]	General Assistance, Indian, Cuban, or Refugee Assistance and other welfare
Other Money Income	307 (14.1)	All other cash sources of income of all people in the household
SOC	[49.6]	Social Security
Unemploy	[3.5]	State unemployment compensation, supplemental unemployment and other unemployment income
Vet	[2.9]	Veterans' benefits
Other	[44.1]	Other cash sources, including U.S. Government railroad retirement
Non-money Income	12 (0.5)	Dollar value of in-kind transfers (means tested) to all persons in the household
F. Stamps	[76.8]	Dollar value of food stamps
Other	[23.2]	Dollar value of energy assistance program and WIC (Women, Infants and Children Nutrition Program)

Source: SIPP.

[a]The means are calculated for the survey month using expansion weights for the national sample; see the text for further explanation. Details may not add due to rounding.

[b]The numbers in parentheses are percentages of total income.

[c]The numbers in brackets are percentages of the particular income source.

and Yitzhaki, 1985, accounted for 82 percent of family income.) The transfer income category we constructed from the SIPP data is limited to the means-tested transfers, therefore, representing a significantly smaller fraction of household income than does the transfer category used by the Department of Commerce in the discussion above. Similarly, what is included in the Department of Commerce's definition of property income is distributed between our definition of property income and other money income, but in 1981, property income averaged 9 percent of the total according to the CPS data (Lerman and Yitzhaki, 1985).

To begin to get an appreciation for the nature of the distribution of income across households, it is instructive to look first at table 2. This table contains the Gini measures of inequality for total income, the five major sources of income and the several income categories within the major sources. The table also contains extended Gini measures for one value of v reflecting preference toward inequality (v = 0.5) and one value (v = 5.0) reflecting substantial aversion to inequality.[4] The differences in the Gini measures are as one might expect, so the discussion focuses on the decomposition of the conventional measure. Detailed information on the decomposition of total income for the extended Gini measures is in Appendix C.

According to the Gini measure, inequality of total income in the survey month is 0.41, a figure similar to that for annual family income over the past several decades as reported by Levy (1987). Although the

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[4] As suggested by Yitzhaki (1983), a value of v between zero and unity reflects a preference for inequality, while a value of v equal to unity reflects indifference to inequality and values above unity reflect increasing aversion to inequality. The conventional Gini is equivalent to the extended measure for v = 2.0.

Table 2. Rank Correlations and Gini Ratios For U.S Household Income by Income Source, 1984

Income Source	v = 2.0 Correlation with Rank of Total Income $[R_k(v)]$	v = 2.0 Gini of Source $[G_k(v)]$	v = 1.5 Correlation with Rank of Total Income $[R_k(v)]$	v = 1.5 Gini of Source $[G_k(v)]$	v = 5.0 Correlation with Rank of Total Income $[R_k(v)]$	v = 5.0 Gini of Source $[G_k(v)]$
Earned	0.900	0.547	0.902	0.360	0.907	0.900
Property	0.545	0.892	0.502	0.695	0.673	1.081
Transfer	-0.434	0.948	-0.295	0.783	-0.948	1.000
SSI	-0.418	0.979	-0.260	0.861	-1.076	1.000
AFDC	-0.473	0.977	-0.309	0.855	-0.940	1.000
Other	-0.306	0.987	-0.190	0.891	-0.753	1.000
Other Money	0.063	0.761	0.062	0.541	0.175	0.991
Soc	-0.186	0.801	-0.166	0.569	-0.169	0.997
Unemploy	-0.075	0.983	-0.068	0.875	0.071	1.000
Vet	-0.005	0.982	-0.009	0.876	0.037	1.000
Other	-0.309	0.914	0.264	0.711	0.539	1.067
Non-money	-0.590	0.946	-0.402	0.777	-1.288	1.000
F. Stamps	-0.607	0.955	-0.405	0.797	-1.363	1.000
Other	-0.502	0.970	-0.332	0.835	-1.034	1.000
Total		0.413		0.275		0.688

Note: See Table 1 for definitions of sources of income. The parameters v are for the extended Gini measure of inequality in equations (7) through (11). If v = 2.0, then the extended Gini measure is equivalent to the conventional Gini measure given in equations (1) through (6).

results from these two very different data sources are not directly comparable, the similarity is reassuring for policy purposes. The primary reason for basing this analysis on SIPP monthly data is the detail it provides regarding income by source.

The Decomposition of Inequality

In analyzing the decomposition of income inequality, it is important to observe that each of the five major sources of income is more unequally distributed than is total income itself. The measure of inequality for earned income is 32 percent higher than it is for total income, while the Gini coefficient for other money income is 84 percent higher. For the other three sources of income (property income, transfers, and non-money income), the Gini coefficient is close to or over 0.9, well over twice the figure for total income. This high degree of inequality in these three sources is explained in large part by the fact that in each case, many households receive none of their income from these sources.

Further insight into the interrelationships of inequality across sources of income can be obtained by examining the figures for the correlation of each income source with the rank of total income (table 2) and how they enter the calculation of the Gini measure in equation (4). As long as these correlations are positive, but less than unity, the income source contributes to total income inequality but at a rate less than its own degree of inequality multiplied by its share of total income. In contrast, if the correlation with the rank of total income is negative, then the income source acts to reduce the level of inequality in total income. This latter situation is true for two major sources of income, transfers and non-money income, as well as for the five components within the categories.

The rank correlations with total income are also negative for the four components of other money income-- Social Security, unemployment benefits, Veterans' benefits and other. Thus, these components of other money income actually reduce income inequality, but, in the aggregate this is not true because the rank correlation with total income of other money income is positive. These differences highlight the importance of detailed disaggregation in examining the policy significance of income components to overall income inequality.

Table 3 contains estimates of the proportional contribution of each income source to all other sources. It also presents the decomposition of each source's inequality by major component. By construction, each of the columns in the table (excluding the numbers in parentheses) add to unity. Given the discussion above, it is not surprising that 92 percent of the inequality in total income is explained by earned income. Property income also accounts for a significant portion, while the small contribution of other money income is just about offset by the negative contributions to the inequality of total income by transfers and non-money income. It may be fruitful to undertake further analysis of the data, decomposing earned and property income into their major components. A particularly useful extension of the results would be to decompose earning by primary and secondary earners and self-employment income.

By looking at table 3, one can also disentangle the reason for why the correlation between other money income and the rank of total income is positive but the correlations are negative for the individual components. The numbers in parentheses in the last column represent the proportional contribution of each of the categories to total income inequality and add to the proportional contributions of each corresponding major income

Table 3. Proportional Contribution of One Income Source to the Inequality of Another Income Source for U.S. Households, 1984 (v=2.0)

Income Source[a]	Income Source: Earned	Property	Transfer	Other Money Income	Non-Money Income	Total Income
Earned	1.000					0.923
Property		1.000				0.079
Transfer						-0.011
SSI			0.337			(-0.004)[b]
AFDC			0.461			(-0.006)
Other			0.202			(-0.002)
Other Money						0.016
Soc				0.466		(-0.025)
Unemploy				0.028		(-0.001)
Vet				0.023		(-0.000)
Other				0.483		(0.042)
Non-money						-0.007
F. Stamps					0.772	(-0.006)
Other					0.228	(-0.001)

[a]See table 1 for definitions of the sources of income. The parameter v is the value of the extended Gini parameter from equations (7) through (11). The proportional changes in inequality given in this table are calculated according to equation (6), with the extended values of $R_k(v)$ and $G_k(v)$ substituted for R_k and G_k when the value of v is not equal to 2.0. The proportional changes for total income can be calculated from the individual proportions for the components using the second-level decomposition described in equations (12) through (15).

[b]The numbers in parentheses add to the proportional contributions of each corresponding income source. The detail may not add due to rounding.

source. In the case of other money income, social security and unemployment, and veterans benefits all reduce inequality, but this reduction is more than offset by the "other" category of other money income.

For those income sources that are subdivided into several components, table 3 also provides estimates of their contribution to the inequality of each source. AFDC payments, for example, account for approximately 47 percent of the inequality in transfer income; SSI is the second most important component, accounting for nearly 34 percent of the inequality. For other money income, Social Security and the "other" category are about equally important, each contributing just under 50 percent of the inequality of this source. Food stamps account for over two-thirds of the inequality in non-money income.

Elasticities of Inequality

The discussion up to now has been instructive in understanding the contribution of various sources of income to overall income inequality. From a policy perspective, however, important information is obtained by the decomposition of the elasticities of inequality by source. For the conventional Gini, these elasticities are reported in table 4. As explained above, these elasticities (from equation (6)) reflect the change in total income inequality resulting from a marginal percentage change in income by source k for each household. (They must add to zero across all income sources because an equal percentage change in all sources for each household would leave inequality unchanged.) Broadly interpreted, these elasticities provide a first approximation to the change in inequality resulting from a general shift in the wage rate, a general change in the level of earnings from property or across the board increases or decreases

Table 4. Elasticity of One Income Source to the Inequality of Another Income Source for U.S. Households, 1984 (v=2.0)

Income Source[a]	Income Source: Earned	Property	Transfer	Other Money Income	Non-Money Income	Total Income
Earned	0					0.148
Property		0				0.012
Transfer						-0.023
SSI			-0.002			(-0.008)[b]
AFDC			0.004			(-0.011)
Other			-0.002			(-0.004)
Other Money						-0.124
Soc				-0.030		(-0.095)
Unemploy				-0.007		(-0.006)
Vet				-0.006		(-0.004)
Other				0.042		(-0.020)
Non-money						-0.013
F. Stamps					0.004	(-0.010)
Other					-0.004	(-0.003)

[a]See table 1 for definitions of the sources of income. The parameter v is the value of the extended Gini parameter from equations (7) through (11). The elasticities of inequality in the table are calculated according to equation (7), with the extended values of $R_k(v)$ and $G_k(v)$ substituted for R_k and G_k when the value of v is not equal to 2.0. The elasticities for total income can be generated from the elasticities of the individual components using the second-level decomposition described in equations (12) through (15).

[b]The numbers in parentheses add to the elasticities of each of the corresponding income sources. The detail may not add due to rounding.

in means-tested transfer programs, Social Security, unemployment benefits or food stamps.

Perhaps the most striking result in table 4 is that all the elasticities are below 0.148 in absolute value. Thus, in general an across the board percentage change in any particular source of household income will lead to a much smaller percentage change in inequality of total income. This is probably a partial explanation for why measures of income inequality in the United States have remained relatively stable in spite of major changes in the levels of transfer program benefits and the structure of the economy.

Because the sum of the elasticities is zero, a number of the individual elasticities will be opposite in sign. As expected, across the board increases in either earned income or property income will lead to an increase in the inequality of total household income. The rate of the increase (0.148) for earned income is more than twelve times that for property income. These positive elasticities are in contrast to the negative ones for the other three sources. Increases in other money income would lead to the largest percentage decrease in total household income inequality, whereas increases in non-money sources of income would have the smallest relative decrease in total income inequality.

From a policy perspective, the elasticities of total income with respect to the individual components of these latter three sources are perhaps the most interesting. First, three-quarters of the elasticity associated with other money income is due to the Social Security component. In absolute value, the effect of a general increase in Social Security benefits is approximately 64 percent as effective at reducing inequality as an increase in earned income is at increasing total income inequality. According to these elasticities, increases in Social Security are nearly ten times as effective at reducing income inequality than are increases in SSI, AFDC and Food Stamps. However, in comparing the elasticities across these major government transfer programs, it is important to remember that the households affected by the programs are quite different, as are the budgetary costs of the changes as indicated in the section that follows. A complete evaluation of these changes would certainly require more information about program costs and final incidence of the benefits.

At the second level of decomposition, one also finds some interesting contrasts in the elasticities of inequality. For example, across the board increases in AFDC would lead to an increase in the inequality of transfer income, while increases in SSI and other transfer programs would have the opposite effect. To the extent that there is a group of low-income households that rely primarily on transfer income, the inequality of incomes for that group would be exacerbated by increases in AFDC benefits at the expense of other transfer programs. For the group of households relying mostly on other money income, an increase in Social Security benefits would clearly reduce the income inequality.

BUDGETARY IMPLICATIONS

While the elasticities of inequality reported above are important from a policy perspective, identifying which programs provide relatively low-cost reductions in inequality is even more important. For example, the elasticities of income inequality reported in table 4 suggest that a one percent increase in Social Security benefits would reduce inequality by 0.095 percent, more than any other of the major government programs covered by this analysis. Table 5 shows, however, that Social Security

Table 5. FY'84 Budgetary Implications of Reducing Inequality

	Expenditures on Benefits			Increases in Benefits Required to Reduce Inequality by One Percent[7]		
	Total	Federal	States	Total	Federal	States
			- - - - - - $ billions - - - - - -			
SSI	10.2[1]	8.1	2.1	12.8	10.2	2.6
AFDC	14.4[2]	7.7	6.7	13.1	7.0	6.1
SOC	180.9[3]	180.9	--	19.0	19.0	--
UNEMPLOY	16.3[4]	3.0	13.3	27.2	5.0	22.2
VET	10.0[5]	10.0	--	25.0	25.0	--
FOODSTAMPS	11.5[6]	11.5	--	11.5	11.5	--

Sources: [1] Committee on Ways and Means, (1985), Table 9, p. 447. [2] Committee on Ways and Means, (1985), Table 13, p. 359. [3] Committee on Ways and Means, (1985), Summary Table 1, p. 3. [4] Committee on Ways and Means, (1985), Table 1, p. 275. [5] Committee on Ways and Means, (1987) Derived from Table 9, p. 716 and text p. 715. [6] Committee on Ways and Means, (1987), Table 1, p. 494.

[7] The calculations assume: (1) increasing benefits would not change who participates; (2) Federal and State shares of benefits would remain constant; and (3) marginal effects on administrative costs would be zero. The calculations utilize the elasticities (ε) reported in the last column of Table 4 and one percent of the expenditures listed above in columns one, two and three as follows: cost of reducing inequality by one percent = $1/\varepsilon$ (cost of increasing benefits from source by one percent).

also has the highest expenditures for benefits of any of those programs. More importantly, further investigation reveals that other programs would yield the same reduction in inequality more cost-effectively than would the Social Security program.

Total Federal and state expenditures on SSI, AFDC, Social Security, Unemployment Insurance, Veterans', and Food Stamp benefits for FY84 are delineated in table 5. For each program, total and jurisdictional budgetary implications of decreasing inequality by one percent also are reported. Five points stand out when evaluating these results.

The first is one that could be overlooked so it's an important point to emphasize at the outset. If the level of inequality is reduced through one of these policy measures, the added income is assumed to accrue only to current participants in a particular program. Thus, even though we are comparing equal reductions in inequality, the households whose incomes are improved will differ substantially. For example, increases in Social Security benefits will improve the lot of the elderly, many of whom are not "poor". Veteran's benefits may also be distributed across the socioeconomic spectrum, but for the younger veterans, there is probably some concentration among the low to lower middle income groups. Increasing benefits under Unemployment Insurance and the means-tested programs for the low-income population will affect the truly disadvantaged, regardless of age etc. provided that they meet the participation requirements and choose to participate in the program.

Second, in some sense it is heartening that the three most cost-effective programs for decreasing income inequality are means-tested programs that specifically target the low income population, SSI, AFDC, and Food Stamps. A one percent decrease in income inequality through the

Food Stamp program would require a budgetary increase of 11.5 billion dollars. To attain the same percentage reduction, SSI or AFDC benefits would have to be increased by 12.8 or 13.5 billion dollars, respectively. In contrast, a one percent reduction in inequality through increases in programs not targeted toward the low-income population, Social Security, Veterans', or Unemployment Insurance, would require 19.0, 25.0, or 27.2 billion dollars, respectively.

The third point can be made by a closer examination of the cost-effectiveness of the means-tested programs. The Food Stamp Program is the least expensive, followed by SSI and AFDC, in turn. The Food Stamp program, however, is the only one of the three that has nationwide eligibility standards and benefit schedules. That is, families that are identical in terms of income, allowable deductions, and family composition receive identical food stamp allotments, wherever they reside. For SSI, Federal benefits are standard nationwide, although states may supplement those benefits. Thus, SSI benefits vary above a base level by state of residence. AFDC benefits, however are entirely determined by each state and exhibit wide variation. Thus, this regional variation in the benefits for these other programs would also mean that improvements in "welfare" from across the board percentage increases would be distributed unevenly by region as well.

Third, for this analysis, we have assumed that the state and Federal shares of total expenditures would remain constant. As indicated in the last two columns of table 5, a one-percent reduction in inequality from across the board increases in SSI, AFDC, or unemployment benefits would affect budgets at state and Federal levels. In the case of unemployment benefits, Federal expenditures would have to increase by $5.0 billion, while state expenditures would have to increase substantially, by $22.2 billion. For AFDC the cost of increasing benefits would be split roughly in half between the Federal and state governments, $7.0 and $6.1 billion, respectively. For SSI, the states that do supplement Federal SSI benefits would have to be willing to raise them by $2.6 billion in addition to the Federal increase of $10.2 billion. The political feasibility of Federal-state cooperation in any of these endeavors is uncertain.

Finally, our analysis shows that the Food Stamp program may be the best candidate for reducing income inequality given that Federal-state cooperation is not needed and that the program is the most cost-effective of the programs studied here. A full one-percent reduction in inequality may not be politically feasible, however, because a doubling of food stamp benefits for current participants would be required. Such a doubling would give participants who receive the full monthly allotment of stamps a food budget larger than the Liberal plan, the high-end food budget designated by the USDA, rather than the low-end Thrifty plan. In April of 1984, the monthly costs of food at home based on the Thrifty plan and the Liberal plan were $267.1 and $507.60, respectively, for a family of 4 which included a couple between 20 and 50 years of age and children between the ages 6-8 and 9-11 years (*Family Economic Review*, 1984).

While a doubling of benefits may not be politically feasible, many have argued that an increase in Food Stamp benefits is needed, largely due to inadequacies in the assumptions underpinning the Thrifty plan (Ranney, 1986). The analysis here suggests one more rationale for increasing Food Stamp program benefits: such increases are cost-effective means for reducing income inequality.

SUMMARY AND CONCLUSIONS

In this paper, we have recognized that the relatively constant inequality in the distribution of U.S. family income masks dramatic changes in the structure of the income distribution and the composition of personal incomes. Using relatively new procedures for decomposing the Gini measure of income inequality, we have gained a better understanding of the relationships among changes in the sources of income and the income distribution. This is facilitated through the use data collected by the Census Bureau in the Survey of Income and Program Participation, which is the only set of data currently available that contains exhaustive lists of income and asset information at the household level.

Using the decomposition methods, we have been able to generate the contribution of each income source to overall income inequality, as well as the elasticities of inequality by income source. Additional insights regarding inequality are gained through a second-level decomposition by major sources of income. In particular, aggregate transfer income, money income other than earned and property income, and non-money income are decomposed further into several major components. The empirical results are used in conjunction with data on transfer program expenditures to gain some perspective on the relative costs of reducing income inequality by increasing program benefits.

Given that each of the sources of income identified in this study is relied on to different degrees by households across the country's various socio-economic groups, it is not surprising that inequality for each income source is significantly higher than for total income, over twice as high for property income, other money income, and transfers. It is also not surprising to find that 92 percent of the inequality in total income is explained by earned income. Property income also accounts for a significant portion, while the small contribution of other money income is just about offset by the negative contributions to the inequality of total income by transfers and non-money income.

Perhaps the most striking empirical result is that all the elasticities are below 0.148 in absolute value. Thus, in general, an across the board percentage change in any particular source of household income will lead to a much smaller percentage change in the inequality of total income. This is undoubtedly the overriding explanation for why measures of income inequality in the United States have remained relatively stable in spite of major changes in the levels of transfer program benefits and the structure of the economy. Unfortunately, this means that it would be extremely difficult to seriously affect the magnitude of income inequality in this country through existing transfer programs at the Federal level. Despite this discouraging finding, it is important to point out that increasing transfer program benefits does move the income distribution in the right direction, although Social Security and programs like AFDC would affect quite different socio-economic groups. Fortunately, the three most cost-effective transfers are those that are means tested, specifically targeting the low-income population.

APPENDIX A
DOCUMENTATION OF A PROGRAM FOR DECOMPOSING THE GINI AND EXTENDED GINI MEASURES OF INEQUALITY

The purpose of this Appendix is to document a program to calculate the conventional Gini and extended Gini measures of income inequality and their decompositions by income source.[1] This particular decomposition was first suggested by Lerman and Yitzhaki (1985), and it is summarized by equations (1) through (6) in the text above. The program is designed to calculate the Gini and extended Gini measures of inequality by income source (equations (7) through (11)), as well as the Gini correlations between income component and total income and the elasticities of inequality by source. An important feature of the program is its ability to handle grouped or ungrouped data.[2] The program, however, does not automatically calculate the two-level decomposition results. Those results can be easily obtained by several passes through the software.

This specialized routine for performing these calculations is written to circumvent the difficulties in calculating the cumulative frequencies by

---

[1] Richard Boisvert developed and generalized the FORTRAN Code discussed in this Appendix. Paul Driscoll suggested the FORTRAN procedure for calculating the cumulative frequencies of each income source without reranking the data. His efforts are appreciated.

[2] Initially, this program was designed to handle grouped data even when the size of the groups were reported as proportions of the sample rather than as the actual number of members of the group. However, this caused a number of problems because the calculations are based on the midpoints of the group intervals. Therefore, one needs to use the actual number of members of the group when using the program. The program is actually designed to convert these data into integers so that this problem is avoided in the calculations.

income source. The difficulties arise because incomes by source are not usually ranked consistently across all observations. Without such a routine one would have to create separate data sets to rank the data for these calculations and then have to merge them back into a single data set for the remainder of the calculations.

The program is written in FORTRAN and was compiled using the Microsoft FORTRAN compiler. Thus, the program is designed to run on an IBM-compatible microcomputer, but it would be an easy task to recompile the source code on a mainframe computer as well. At the present time, the code is designed to handle up to 5 income sources, up to 420 observations (either observations on single income earning unit or groups of units), and calculate extended Gini results for up to 10 different extended Gini weights. The program's capacity can be expanded easily by recompiling the program after simply resetting three parameter values.[1]

The remainder of this Appendix is organized into two short sections. The first illustrates how to use the program using a set of sample data, while the second section describes the results and explains the computer output.

---

[1] The source code for the FORTRAN program is contained in Appendix B. The value of MAXI is used to specify the maximum number of individual observations or groups. The value of MAXJ is used to specify the maximum number of income sources, and the value of MAXV is used to specify the number of extended Gini weights. The program is currently written in double precision so there is currently limited capacity to increase the dimensions of the program if it is to be run on a microcomputer. However, there is little need for the program to be written in double precision and it would be a relatively simple task to change it to single precision. This would involve a redeclaration of the real variables, the reinitialization of some variables from 0.0D0 to 0.0, and a change in the way in which some integer variables are set to real variables and vice versa. A simple search of the program for 0.0D0, INT, and DBLE would pick up these functions in the program.

AN EMPIRICAL EXAMPLE USING A SAMPLE DATA SET

In this section, a small hypothetical data set is used to illustrate the operation of this program. The data set includes three sources of income and six groups. The program requires two input files. The first file is for a set of program parameters, including labels for the income sources. The data for this file are in Table A-1. The second file contains the actual income data by source. The hypothetical data for this file are in Table A-2.[2]

Table A-1. Input Parameters for Extended Gini Example

```
 3  0  6  3
 1.25  2.00 3.00
Source 1
Source 2
Source 3
```

Table A-2. Sample Income Data by Source, Year 1

Number of Farms	Average Income Source 1	Average Income Source 2	Average Income Source 3	Average Income Total
1849	729.584	54.083	2731.747	3515.414
617	1743.922	131.280	1847.650	3722.853
660	2895.455	218.182	1574.242	4687.879
497	4641.851	319.920	1257.545	6219.316
227	7370.044	488.987	1678.414	9537.445
113	15893.805	946.903	2176.991	19017.699

[2] When running this program on a microcomputer, you will be prompted for two input files. The parameter input should be entered when unit 10 is requested; the income data file should be entered when unit 11 is requested; and the output is written to unit 12.

The Input Parameters

There are three basic types of input parameters. The first record in the input file containing these parameters has four entries. They are read in free format, that is, they can be placed anywhere in the record as long as each is separated by at least one space. The first entry is the number of income sources. The second entry is a 0 if total income is to be read as data; it is 1 if total income is to be calculated by summing the components. The third entry contains the number of observations (or groups) for which the input data are to be printed; zero (which must be typed) is the default that will print the data for all the observations. The final entry on the first record is the number of weights for which the extended Gini measure of inequality is to be calculated. The second record contains the list of specific extended Gini parameters for which results are to be calculated. The remaining records contain the names of the sources of income. The names are used as labels in the output of the program. One label is to appear on each record, listed in the same order as the income sources in the second input file.

The Income Data

The second input file (see Table A-2) contains the actual input data. The data for each observation or group are all in free format on a single record. The first entry in the record is the number of households (or other income earning units of observation) in the group. (In the case where the data are not grouped, this entry should be unity). This number is followed by the average incomes for each source for each group. In this example, total income is read as data; the average total income for units in a group is the last entry in each record.[3]

EXPLANATION OF THE OUTPUT

The output from the application of this program to the sample data is found in Table A-3. It is reasonably self-explanatory.

The first section of the output contains a print of the income input data. (In this case, data for all six groups are printed.) Income by source is followed by the empirically estimated cumulative frequency. The last three entries include the total income, its cumulative frequency, and the number of households in the group.[4]

The second section of the output contains the decomposition of the conventional Gini measure of inequality. (This is equivalent to the extended Gini results for an extended Gini parameter equal to 2.) The first part of this section includes mean income by source, income share by income source, and the covariances of income by source and the cumulative frequencies of total income. The second part of this section contains the Gini ratios by source, the ratios of the covariances, the values for RGS (from

---

[3] Since the program is written to continue to read data until the end of the file is encountered, there is no need to enter the number of observations (or groups) in the parameter input file mentioned above.

[4] In calculating the cumulative frequencies, it is important that incomes for any of the groups are not equal, otherwise some of the cumulative frequencies will be calculated incorrectly. To circumvent this problem, incomes are incremented by a very small amount equal to 0.00000001 times the input record number. This has no effect on the result, but it avoids the problem of having the same cumulative frequency assigned to the incomes for a particular source for more than one group.

Table A-3. Output from Extended Gini Program Data

INCOME BY: Source 1	CUMFREQS: Source 1	INCOME BY: Source 2	CUMFREQS: Source 2	INCOME BY: Source 3	CUMFREQS: Source 3
729.58	.23341	54.08	.23341	2731.75	.98587
1743.92	.54454	131.28	.54454	1847.65	.47641
2895.46	.70565	218.18	.70565	1574.24	.22937
4641.85	.85163	319.92	.85163	1257.55	.06283
7370.04	.94297	488.99	.94297	1678.41	.32072
15893.81	.98587	946.90	.98587	2176.99	.51930

TOT. INCOME	CUMFREQ	NUMBER
3515.41	.23341	1849.00
3722.85	.54454	617.00
4687.88	.70565	660.00
6219.32	.85163	497.00
9537.45	.94297	227.00
19017.70	.98587	113.00

NAME	MEAN INCOME	INCOME SHARE	COVARIANCE
Source 1	2551.602546	.524046	632.080513
Source 2	177.138450	.036381	41.266914
Source 3	2140.297704	.439573	213.823701

NAME	GINI RATIO	COVRATIO	RSG	PROPOR	ELASTICITY
Source 1	.495438	1.000000	.259633	1.196608	.672562
Source 2	.465928	1.000000	.016951	.078123	.041743
Source 3	.199807	-.678693	-.059610	-.274732	-.714304
TOTAL	.216974				

NUMBER OF EXTENDED GINI PARAMETERS = 3

ENTENDED GINI PARAMETER NO. 1 = 1.250

ENTENDED GINI PARAMETER NO. 2 = 2.000

ENTENDED GINI PARAMETER NO. 3 = 3.000

EXTENDED GINI WEIGHT 1.250000

NAME	MEAN INCOME	INCOME SHARE	COVARIANCE
Source 1	2551.602546	.524046	-427.827858
Source 2	177.138450	.036381	-27.143027
Source 3	2140.297704	.439573	-164.013912

NAME	GINI RATIO	COVRATIO	RSG	PROPOR	ELASTICITY
Source 1	.209588	1.000000	.109834	1.111513	.587467
Source 2	.191538	1.000000	.006968	.070519	.034138
Source 3	.095789	-.427190	-.017987	-.182032	-.621605
TOTAL	.098815				

Table A-3. (Continued)

EXTENDED GINI WEIGHT 2.000000

NAME	MEAN INCOME	INCOME SHARE	COVARIANCE
Source 1	2551.602546	.524046	-632.080513
Source 2	177.138450	.036381	-41.266914
Source 3	2140.297704	.439573	-213.823701

NAME	GINI RATIO	COVRATIO	RSG	PROPOR	ELASTICITY
Source 1	.495438	1.000000	.259633	1.196608	.672562
Source 2	.465928	1.000000	.016951	.078123	.041743
Source 3	.199807	-.678693	-.059610	-.274732	-.714304
TOTAL	.216974				

EXTENDED GINI WEIGHT 3.000000

NAME	MEAN INCOME	INCOME SHARE	COVARIANCE
Source 1	2551.602546	.524046	-513.946280
Source 2	177.138450	.036381	-34.171904
Source 3	2140.297704	.439573	-177.617984

NAME	GINI RATIO	COVRATIO	RSG	PROPOR	ELASTICITY
Source 1	.604263	1.000000	.316662	1.265580	.741534
Source 2	.578732	1.000000	.021055	.084147	.047767
Source 3	.248963	-.799597	-.087506	-.349728	-.789301
TOTAL	.250211				

equation (4)), and the proportions and elasticities of inequality by source from equations (5) and (6), respectively).

The next section of the output reports the number of extended Gini parameters for which extended Gini results are reported, and lists the values of the parameters. This is followed by the final section of the output containing the extended Gini results for each of these parameter values. The output in this section is identical to that for the conventional Gini, only the calculations are based on equations (7) through (11).

APPENDIX B

```
C               PROGRAM INDECOMP
C
C  WRITTEN BY:  RICHARD N. BOISVERT
C               DEPARTMENT OF AGRICULTURAL ECONOMICS
C               CORNELL UNIVERSITY
C
C  DATE:  MARCH 1, 1991
C  LANGUAGE:  FORTRAN-- IBM COMPATIBLE
C
C  PURPOSE:
C    TO CALCULATE GINI RATIOS FOR INCOME AND ITS DECOMPOSITION
C  OF INCOME INEQUALITY BY SOURCE AS DEVELOPED BY LERMAN AND YITZHAKI
C
C  DOCUMENTATION:
C    THE PROGRAM IS CURRENTLY DIMENSIONED TO HANDLE 420 GROUPED
C  OBSERVATIONS ON 5 INCOME SOURCES, ALTHOUGH THE CODE IS DESIGNED TO
C  WORK WITH GROUPED DATA, IT WILL HANDLE INDIVIDUAL OBSERVATIONS BY
C  ASSIGNING ONE OBSERVATION PER GROUP.  THE PROGRAM ALSO CALCULATES
C  EXTENDED GINI MEASURES OF INEQUALITY AND THEIR DECOMPOSITIONS.
C  CURRENTLY THE PROGRAM IS DIMENSIONED TO HANDLE UP TO 10 SEPARATE
C  VALUES OF THE EXTENDED GINI PARAMETERS.  THE DATA INPUT FOR THE
C  PROGRAM IS IN TWO SEPARATE INPUT FILES.  ONE FILE CONTAINS PROGRAM
C  PARAMETERS; THE OTHER CONTAINS THE DATA.  BOTH ARE IN FREE FORMAT.
C
C
C
C
C
C
C*************************************************************************
C
C  VARIABLE DEFINITIONS
C
C   REAL VARIABLES
C    OBS(I) OBSERVATION NUMBER OF GROUP(I)
C    NUM(I) IS THE NUMBER OF FAMILIES IN GROUP OBSERVATION I
C    ASINC(I,J) IS INCOME FROM SOURCE J OF OBSERVATION I
C    ATTOT(I) IS TOTAL INCOME FOR OBSERVATION I
C    CFSINC(I,J) IS THE CUMULATIVE FREQUENCY OF OBSERVATION I, SOURCE J
C    XCFS STORES 1-CFSINC(I,J) TEMPORARILY FOR USE IN EXTENDED GINI
C      CALCULATIONS
C    CFTTOT(I) IS THE CUMULATIVE FREQUENCY OF OBSERVATION I
C      FOR TOTAL INCOME
C    XCFT STORES 1-CFTTOT(I) TEMPORARILY FOR USE IN THE EXTENDED GINI
C      CALCULATIONS
C    FREQ(I) IS NUM(I)/NUMTOT
C    FMID(I) IS (NUM(I)+1)/(2*NUMTOT)
C    AFMID IS
C    AFREQ IS
C    MA(J) IS AVERAGE INCOME OF SOURCE(J)
C    MCATOT IS AVERAGE CUMULATIVE FREQUENCY OF TOTAL INCOME
C    MATTOT IS AVERAGE TOTAL INCOME
```

```
C    MCA(J) IS AVERAGE CUMULATIVE FREQUENCY OF INCOME SOURCE J
C    COV(J) IS COVARIANCE BETWEEN INCOME BY SOURCE AND
C      CUMULATIVE FREQUENCY BY SOURCE
C    COVT IS COVARIANCE BETWEEN TOTAL INCOME AND CUMULATIVE
C      FREQUENCY OF TOTAL INCOME
C    COVST(J) IS COVARIANCE BETWEEN INCOME BY SOURCE AND
C      CUMULATIVE FREQUENCY OF TOTAL INCOME
C    G(J) IS GINI SOURCE J
C    GT IS GINI OF TOTAL INCOME
C    R(J) IS COVST(J)/COV(J)
C    SA(J) IS THE SHARE AVERAGE INCOME FOR SOURCE J OF
C      AVERAGE TOTAL INCOME
C    RGS(J) IS R(J)*G(J)*SA(J)
C    P(J) IS RGS(J)/GT
C    E(J) IS P(J)-SA(J)
C    NAME(J) IS NAME OF INCOME SOURCE
C   INTEGER VARIABLES
C    IREADT(J) IS 0 IF READ TOTAL INCOME, 1 IF CALCULATE
C      TOTAL INCOME
C    NUMTOT IS TOTAL NUMBER OF OBSERVATIONS IN ALL I GROUPS
C    NSINC IS NUMBER OF INCOME SOURCES
C   PARAMETERS
C    MAXJ IS MAXIMUM NUMBER OF INCOME SOURCES
C    MAXI IS MAXIMUM NUMBER OF OBSERVATION GROUPS
C    MAXV IS THE MAXIMUM NUMBER OF EXTENDED GINI PARAMETERS
C      TO BE EVALUATED
C    KV(K) IS THE VALUE OF THE KTH EXPANDED GINI PARAMETER
C    NKV IS THE NUMBER OF EXTENDED GINI PARAMETERS READ
C
C
C   *****************************************************************
C
      PARAMETER (MAXJ=5, MAXI=420, IN1=10, IN2=11,IOUT=12)
      PARAMETER (MAXV=10)
C
      REAL*8 OBS(MAXJ),NUM(MAXI),ASINC(MAXI,MAXJ),ATTOT(MAXI),
     & CFSINC(MAXI,MAXJ),CFTTOT(MAXI),FREQ(MAXI),FMID(MAXI),
     &AFMID,AFREQ,MA(MAXJ),MCATOT,MATTOT,MCA(MAXJ),COV(MAXJ),
     & COVT,COVST(MAXJ),G(MAXJ),GT,R(MAXJ),SA(MAXJ),RGS(MAXJ),
     & E(MAXJ),P(MAXJ),KV(MAXV),XCFS,XCFT,NUMTOT
C
      INTEGER INUM,NSINC,IREADT,IWRT,NKV
C
      CHARACTER*10 NAME(MAXJ)
C
C  ******BEGINNING OF BODY OF PROGRAM**********************************
C
C  READ PROGRAM CONTROL DATA AND SOURCE NAMES
      READ(IN1,*) NSINC,IREADT,IWRT, NKV
      READ (IN1,*) (KV(III),III=1,NKV)
      INUM = INT(NUM(I))
      NUM(I) = DBLE(INUM)
      DO 999 J = 1,NSINC
      READ(IN1,1005) NAME(J)
```

```
  999 CONTINUE
C
C  READ THE MEMBERS BY GROUP AND INCOME DATA BY SOURCE
      IF (IREADT.EQ.1) THEN
C
C  READS MEMBERS BY GROUP, INCOME BY SOURCE, AND CALCULATE
C  TOTAL INCOME
         I=1
  100    READ(IN2,*,END=200)NUM(I), (ASINC(I,J),J=1,NSINC)
         I=1+I
         GO TO 100
  200    CONTINUE
         I=I-1
      DO 215 K=1,I
         ATTOT(K)=0.0D0
      DO 215 J=1,NSINC
         ATTOT(K)= ATTOT(K)+ASINC(K,J)
  215 CONTINUE
      ELSE
C
C  READS MEMBERS BY GROUP, INCOME BY SOURCE, AND TOTAL INCOME
         I=1
  230    READ(IN2,*,END=250)NUM(I),(ASINC(I,J),J=1,NSINC),
     &         ATTOT(I)
         I=I+1
         GO TO 230
  250    CONTINUE
         I=I-1
      END IF
C
C  THIS SECTION ADDS A SMALL INCOME TO EACH OBSERVATION
C  SO THAT INCOMES ARE NOT EQUAL
      DO 255 K=1,I
         XFK = DBLE(K)
         ATTOT(K)=ATTOT(K)+0.0000001*XFK
      DO 255 J=1,NSINC
         ASINC(K,J) = ASINC(K,J)+0.0000001*XFK
  255 CONTINUE
C
C  CALCULATE TOTAL NUMBER OF INCOME UNITS
      NUMTOT=0.0D0
      DO 260 K=1,I
         NUMTOT=NUMTOT+NUM(K)
  260 CONTINUE
C
C  THIS SECTION CALCULATES FMID AND FREQ
      DO 270 K=1,I
         FMID(K)=(NUM(K)+1)/(2*NUMTOT)
         FREQ(K)=(NUM(K))/NUMTOT
  270 CONTINUE
C
C  THIS SECTION CALCULATES CUMULATIVE FREQUENCIES FOR
C  INCOME SOURCES
      DO 290 J=1,NSINC
```

```
      DO 280 K1=1,I
         CFSINC(K1,J)=0.0D0
         AFMID=0.0D0
         AFREQ=0.0D0
         DO 277 K=1,I
            IF(ASINC(K1,J) .GE. ASINC(K,J)) THEN
               CFSINC(K1,J)=CFSINC(K1,J)-AFMID+AFREQ+FMID(K)
               AFMID = FMID(K)
               AFREQ = FREQ(K)
            END IF
277      CONTINUE
280   CONTINUE
290 CONTINUE
C
C  CALCULATE CUMULATIVE FREQUENCIES FOR TOTAL INCOME
    DO 300 K1=1,I
       CFTTOT(K1) = 0.0D0
       AFMID = 0.0D0
       AFREQ =0.0D0
       DO 310 K=1,I
          IF(ATTOT(K1) .GE. ATTOT(K)) THEN
             CFTTOT(K1)=CFTTOT(K1)-AFMID+AFREQ+FMID(K)
             AFMID = FMID(K)
             AFREQ = FREQ(K)
          END IF
310    CONTINUE
300 CONTINUE
C
C  WRITE OUT INCOME BY SOURCE AND CUMULATIVE FREQUENCIES
    IF (IWRT .NE. 0) THEN
       KK=IWRT
    ELSE
       KK=I
    END IF
    PP=(NSINC+1)/3
    NPP=(INT(PP))+1
    DO 320 J1=1,NPP
       IF (NVE .EQ. NSINC) GO TO 327
       NVS=((J1-1)*3)+1
       NVE= MIN((J1*3),NSINC)
       WRITE(IOUT,1000)(NAME(JJ),NAME(JJ),JJ=NVS,NVE)
          DO 325 K=1,KK
             WRITE(IOUT,4000)(ASINC(K,JJ),CFSINC(K,JJ),JJ=NVS,NVE)
325          CONTINUE
327   CONTINUE
320 CONTINUE
    WRITE(IOUT,2000)
    DO 326 K=1,KK
       WRITE(IOUT,5000) ATTOT(K),CFTTOT(K),NUM(K)
326 CONTINUE
C
C  THIS SECTION CALCULATES AVERAGE INCOMES BY SOURCE AND
C  AVERAGE CUMULATIVE FREQUENCIES FOR USE IN COVARIANCE
C  CALCULATIONS
```

```
      DO 350 J=1,NSINC
         MA(J) = 0.0D0
         MCA(J) = 0.0D0
  350 CONTINUE
         MCATOT = 0.0D0
         MATTOT = 0.0D0
      DO 360 J=1,NSINC
         DO 365 K=1,I
            MA(J)=MA(J)+ASINC(K,J)*FREQ(K)
            MCA(J)=MCA(J)+CFSINC(K,J)*FREQ(K)
  365    CONTINUE
  360 CONTINUE
         DO 370 K=1,I
            MATTOT=MATTOT+ATTOT(K)*FREQ(K)
            MCATOT=MCATOT+CFTTOT(K)*FREQ(K)
  370    CONTINUE
C
C  THIS SECTION CALCULATES THE COVARIANCES BETWEEN INCOME BY
C  SOURCE AND THE CUMULATIVE FREQUENCY OF TOTAL INCOME
      DO 400 J=1,NSINC
         COV(J)=0.0D0
         COVST(J) = 0.0D0
  400 CONTINUE
         COVT = 0.0D0
         DO 410 J=1,NSINC
         DO 405 K=1,I
            COV(J)=COV(J)+(ASINC(K,J)-MA(J))*(CFSINC(K,J)
     &                -MCA(J))*FREQ(K)
            COVST(J)=COVST(J)+(ASINC(K,J)-MA(J))*(CFTTOT(K)
     &                -MCATOT)*FREQ(K)
  405       CONTINUE
  410 CONTINUE
         DO 415 K=1,I
            COVT=COVT+(ATTOT(K)-MATOT)*(CFTTOT(K)-MCATOT)*FREQ(K)
  415    CONTINUE
C
C  THIS SECTION CALCULATES GINIS BY SOURCE
C  AND RATIOS OF COVARIANCES
      DO 430 J=1,NSINC
         G(J)=2*COV(J)/MA(J)
         R(J)=COVST(J)/COV(J)
  430 CONTINUE
      GT=2*COVT/MATTOT
C
C  THIS SECTION CALCULATES INCOME SHARES BY SOURCE
      DO 435 J=1,NSINC
         SA(J)=MA(J)/MATTOT
  435 CONTINUE
C
C  THIS SECTION CALCULATES RGS,THE PROPORTIONS AND THE
C  ELASTICITIES OF TOTAL INCOME INEQUALITY BY SOURCE
      DO 450 J=1,NSINC
         RGS(J)=R(J)*G(J)*SA(J)
         P(J)=RGS(J)/GT
```

```
        E(J)=P(J)-SA(J)
  450 CONTINUE
C
C  THIS SECTION WRITES OUT THE RESULTS FOR THE CONVENTIONAL GINI
C
C     THIS SUBSECTION PRINTS MEANS, SHARES AND COVARIANCES
      WRITE(IOUT,7000)
      DO 460 J=1,NSINC
         WRITE(IOUT,8000) NAME(J),MA(J),SA(J),COV(J)
  460 CONTINUE
      WRITE(IOUT,7500)
      DO 470 J=1,NSINC
         WRITE(IOUT,8500) NAME(J),G(J),R(J),RGS(J),P(J),E(J)
  470 CONTINUE
      WRITE(IOUT,8600)GT
C  THIS SECTION RECALCULATES CUMULATIVE FREQUENCY DISTRIBUTIONS
C  FOR SOURCES OF INCOME AND TOTAL INCOME FOR USE IN THE EXTENDED
C  GINI
       IF (NKV .NE. 0) THEN
          WRITE (IOUT,8550) NKV
          DO 504 III=1,NKV
             WRITE (IOUT,8560) III,KV(III)
  504     CONTINUE
          DO 505  III=1,NKV
            DO 520 J=1,NSINC
               DO 530 K=1,I
C                 XCFS = 1.0D0 - CFSINC(K,J)
C                 XCFT = 1.0D0 - CFTTOT(K)
          IF ( (1.0D0-CFSINC(K,J)) .LT. 0.0D0) THEN
             WRITE (IOUT,9998) J,K,CFSINC(K,J)
 9998 FORMAT (1X,'1-CFSINC(K,J) IS LESS THAN 0.0',2I5,D20.5)
             CFSINC(K,J) = 1.0D0
          END IF
C
C  PRINTS OUT A MESSAGE AND SETS (1 - CUMULATIVE FREQUENCY) TO 0.0
C  IF IT IS A SMALL NEGATIVE NUMBER
          IF ( (1.0D0-CFTTOT(K)) .LT. 0.0D0) THEN
             WRITE (IOUT,9999) J,K,CFTTOT(K)
             CFTTOT(K) = 1.0D0
          END IF
C                CFSINC(K,J)=(XCFS)**((KV(III)-1.0D0))
C                CFTTOT(K)=(XCFT)**((KV(III)-1.0D0))
  530          CONTINUE
  520        CONTINUE
C  THIS SECTION CALCULATES AVERAGE INCOME BY SOURCE AND ONE MINUS
C  THE CUMULATIVE FREQUENCY ALL TO THE KV(III)-1 POWER FOR USE IN
C  COVARIANCE CALCULATIONS FOR THE EXTENDED GINI
             DO 540 J=1,NSINC
                MCA(J) = 0.0D0
  540        CONTINUE
                MCATOT = 0.0D0
             DO 550 J=1,NSINC
                DO 560 K=1,I
                   XCFS=(1.0D0-CFSINC(K,J))**(KV(III)-1)
```

```
                 MCA(J)=MCA(J)+XCFS*FREQ(K)
 560          CONTINUE
 550        CONTINUE
            DO 570 K=1,I
                XCFT=(1.0D0-CFTTOT(K))**(KV(III)-1)
                MCATOT=MCATOT+XCFT*FREQ(K)
 570        CONTINUE
C  THIS SECTION CALCULATES COVARIANCES FOR THE EXTENDED GINI
            DO 580 J=1,NSINC
               COV(J)=0.0D0
               COVST(J)=0.0D0
 580        CONTINUE
               COVT=0.0D0
            DO 590 J=1,NSINC
               DO 600 K=1,I
                     XCFS=(1.0D0-CFSINC(K,J))**(KV(III)-1)
                     XCFT=(1.0D0-CFTTOT(K))**(KV(III)-1)
                     COV(J)=COV(J)+(ASINC(K,J)-
     &               MA(J))*(XCFS-MCA(J))*FREQ(K)
                     COVST(J)=COVST(J)+(ASINC(K,J)-
     &               MA(J))*(XCFT-MCATOT)*FREQ(K)
 600           CONTINUE
 590        CONTINUE
            DO 610 K=1,I
               XCFT=(1.0D0-CFTTOT(K))**(KV(III)-1)
               COVT=COVT+(ATTOT(K)-
     &              MATTOT)*(XCFT-MCATOT)*FREQ(K)
 610        CONTINUE
C
C  THIS SECTION CALCULATES THE VALUE OF EXTENDED GINIS BY SOURCE
C  AND RATIOS OF COVARIANCES FOR EXTENDED GINI DECOMPOSITION
            DO 620 J=1,NSINC
               G(J)=(-KV(III))*COV(J)/MA(J)
               R(J)=COVST(J)/COV(J)
 620        CONTINUE
               GT=(-KV(III))*COVT/MATTOT
C
C  THIS SECTION CALCULATES INCOME SHARES BY SOURCE
           DO 625 J=1,NSINC
              SA(J)=MA(J)/MATTOT
 625       CONTINUE
C
C  THIS SECTION CALCULATES R,G,S, THE PROPORTIONS, AND THE
C  ELASTICITICIES OF TOTAL INCOME INEQUALITY BY SOURCE FOR THE
C  EXTENDED GINI
            DO 630 J=1,NSINC
               RGS(J)=R(J)*G(J)*SA(J)
               P(J)=RGS(J)/GT
               E(J)=P(J)-SA(J)
 630        CONTINUE
C
C  THIS SECTION WRITES OUT EXTENDED GINI RESULTS, MEANS, SHARES
C  AND COVARIANCES
            WRITE (IOUT, 8700) KV(III)
```

```
          WRITE (IOUT,7000)
          DO 640 J=1,NSINC
             WRITE (IOUT,8000) NAME(J),MA(J),SA(J),COV(J)
 640      CONTINUE
          WRITE (IOUT,7500)
          DO 650 J=1,NSINC
             WRITE (IOUT,8500) NAME(J),G(J),R(J),RGS(J),P(J),E(J)
 650      CONTINUE
          WRITE (IOUT,8600) GT
 505    CONTINUE
      END IF
1000  FORMAT(1X,/,2X,'INCOME BY:   CUMFREQS:  INCOME BY:  ',
     & ' CUMFREQS:  INCOME BY:   CUMFREQS:  ',/,
     &  2XA10,2X,A10,2X,A10,2X,A10,2X,A10,2X,A10,/)
1005  FORMAT(A10)
2000  FORMAT(1X,/,2X,' TOT. INCOME     CUMFREQ      NUMBER',/)
4000  FORMAT(3(F12.2,F12.5))
5000  FORMAT (2X,F12.2,F12.5,F12.2)
7000  FORMAT(1X,'NAME         MEAN INCOME      INCOME SHARE',
     &            '  COVARIANCE',/)
7500  FORMAT(2X,'NAME    GINI RATIO  COVRATIO       RSG',
     &          '    PROPOR  ELASTICITY',/)
8000  FORMAT(A10,3F15.6)
8600  FORMAT(2X,'TOTAL      ',F10.6,/)
8500  FORMAT(A10,5F10.6)
8550  FORMAT (1X,'NUMBER OF EXTENDED GINI PARAMETERS = ',I3,/)
8560  FORMAT (1X,'ENTENDED GINI PARAMETER NO.',I3,' = ',F6.3,/)
8700   FORMAT(1X,'EXTENDED GINI WEIGHT',F10.6,/)
9999  FORMAT (1X,'1-CFTTOT(K) IS LESS THAN 0.0',2I5,D20.5)
      STOP
      END
```

APPENDIX C

RESULTS FROM THE EXTENDED GINI DECOMPOSITION

Table C-1. Proportional Contribution of One Income Source to the Inequality of Another Income Source for U.S. Households, 1984 (v=1.5)

Income Source[a]	Income Source: Earned	Property	Transfer	Other Money Income	Non-Money Income	Total Income
Earned	1.000					0.914
Property		1.000				0.085
Transfer						-0.010
SSI			0.333			(-0.003)[b]
AFDC			0.468			(-0.005)
Other			0.199			(-0.001)
Other Money						0.017
Soc				0.435		(-0.024)
Unemploy				0.024		(-0.001)
Vet				0.022		(-0.000)
Other				0.519		(0.042)
Non-money						-0.006
F. Stamps					0.778	(-0.005)
Other					0.222	(-0.001)

[a]See table 1 for definitions of the sources of income. The parameter v is the value of the extended Gini parameter from equations (7) through (11). The proportional changes in inequality given in this table are calculated according to equation (6), with the extended values of $R_k(v)$ and $G_k(v)$ substituted for R_k and G_k when the value of v is not equal to 2.0. The proportional changes for total income can be calculated from the individual proportions for the components using the second-level decomposition described in equations (12) through (15).

[b]The numbers in parentheses add to the proportional contributions of each corresponding income source. The detail may not add due to rounding.

Table C-2. Proportional Contribution of One Income Source to the Inequality of Another Income Source for U.S. Households, 1984 (v=5.0)

Income Source[a]	Earned	Property	Transfer	Other Money Income	Non-Money Income	Total Income
Earned	1.000					0.919
Property		1.000				0.071
Transfer						-0.016
SSI			0.339			(-0.006)[b]
AFDC			0.457			(-0.007)
Other			0.204			(-0.003)
Other Money						0.035
Soc				0.495		(-0.017)
Unemploy				0.035		(0.001)
Vet				0.024		(0.000)
Other				0.446		(0.052)
Non-money						-0.010
F. Stamps					0.768	(-0.008)
Other					0.232	(-0.002)

[a]See table 1 for definitions of the sources of income. The parameter v is the value of the extended Gini parameter from equations (7) through (11). The proportional changes in inequality given in this table are calculated according to equation (6), with the extended values of $R_k(v)$ and $G_k(v)$ substituted for R_k and G_k when the value of v is not equal to 2.0. The proportional changes for total income can be calculated from the individual proportions for the components using the second-level decomposition described in equations (12) through (15).

[b]The numbers in parentheses add to the proportional contributions of each corresponding income source. The detail may not add due to rounding.

Table C-3. Elasticity of One Income Source to the Inequality of Another Income Source for U.S. Households, 1984 (v=1.5)

Income Source[a]	Earned	Property	Transfer	Other Money Income	Non-Money Income	Total Income
Earned	0					0.138
Property		0				0.018
Transfer						-0.021
SSI			-0.006			(-0.007)[b]
AFDC			0.011			(-0.010)
Other			-0.005			(-0.004)
Other Money						-0.124
Soc				-0.060		(-0.094)
Unemploy				-0.011		(-0.006)
Vet				-0.007		(-0.004)
Other				0.078		(-0.020)
Non-money						-0.011
F. Stamps					0.010	(-0.009)
Other					-0.010	(-0.002)

[a] See table 1 for definitions of the sources of income. The parameter v is the value of the extended Gini parameter from equations (7) through (11). The elasticities of inequality in the table are calculated according to equation (7), with the extended values of $R_k(v)$ and $G_k(v)$ substituted for R_k and G_k when the value of v is not equal to 2.0. The elasticities for total income can be generated from the elasticities of the individual components using the second-level decomposition described in equations (12) through (15).

[b] The numbers in parentheses add to the elasticities of each of the corresponding income sources. The detail may not add due to rounding.

Table C-4. Elasticity of One Income Source to the Inequality of Another Income Source for U.S. Households, 1984 (v=5.0)

Income Source[a]	Income Source: Earned	Property	Transfer	Other Money Income	Non-Money Income	Total Income
Earned	0					0.144
Property		0				0.004
Transfer						-0.027
SSI			-0.000			(-0.010)[b]
AFDC			-0.000			(-0.012)
Other			-0.000			(-0.005)
Other Money						-0.105
Soc				-0.000		(-0.087)
Unemploy				-0.000		(-0.004)
Vet				-0.004		(-0.004)
Other				0.005		(-0.010)
Non-money						-0.015
F. Stamps					0.000	(-0.012)
Other					-0.000	(-0.003)

[a]See table 1 for definitions of the sources of income. The parameter v is the value of the extended Gini parameter from equations (7) through (11). The elasticities of inequality in the table are calculated according to equation (7), with the extended values of $R_k(v)$ and $G_k(v)$ substituted for R_k and G_k when the value of v is not equal to 2.0. The elasticities for total income can be generated from the elasticities of the individual components using the second-level decomposition described in equations (12) through (15).

[b]The numbers in parentheses add to the elasticities of each of the corresponding income sources. The detail may not add due to rounding.

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