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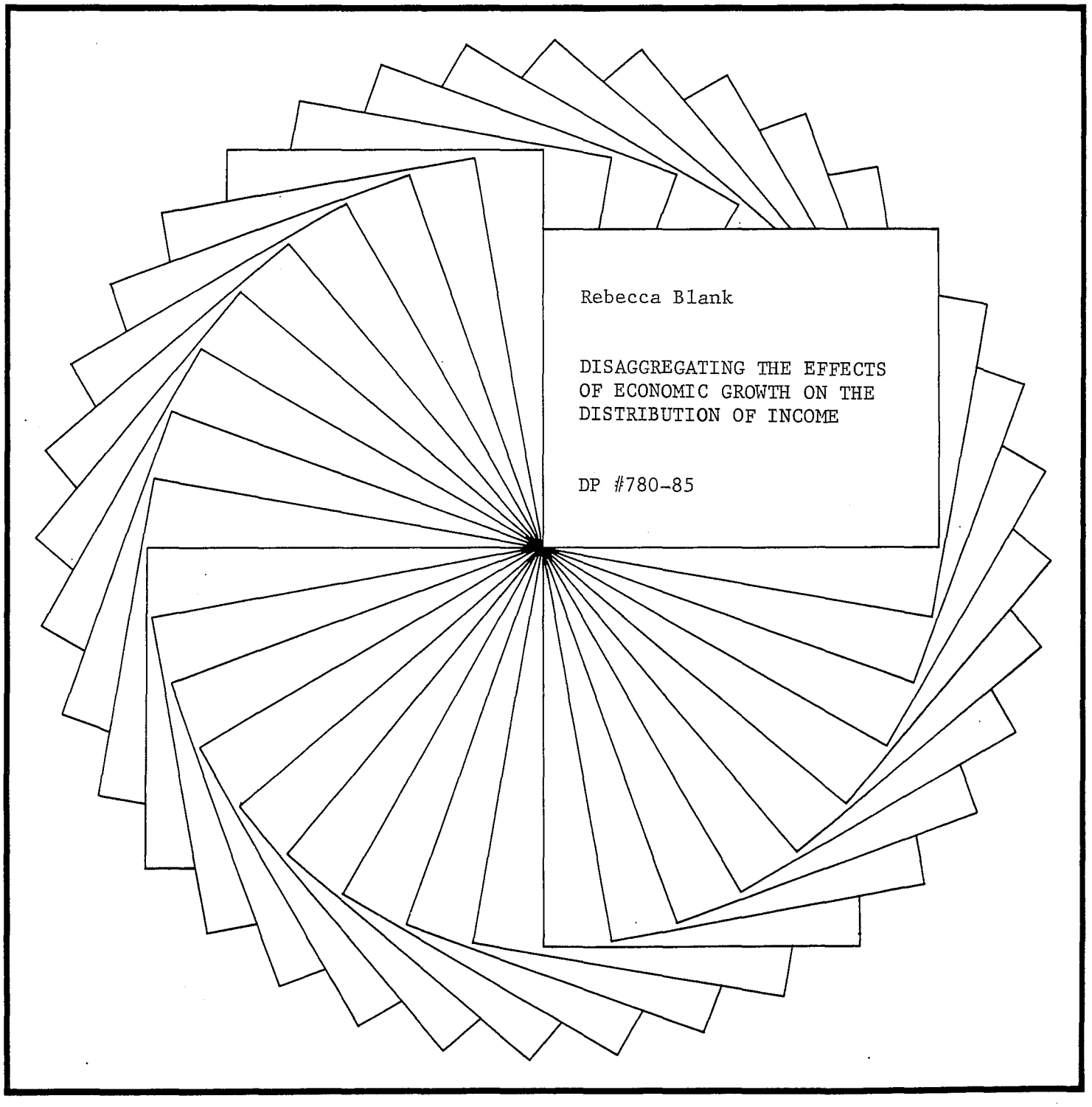

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DISAGGREGATING THE EFFECTS OF ECONOMIC GROWTH ON THE DISTRIBUTION OF INCOME

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ABSTRACT

This paper disaggregates total income received by households into a set of components and studies the comparative changes in these components in response to economic growth. The relative responsiveness of wages, hours of work, total labor market income of household heads and wives, and transfer income is assessed across groups designated by income, race, sex, and age. The results provide a picture of the channels by which economic growth produces income change.

Significant differences in elasticities (responsiveness to economic growth) are found to exist both across income components and across population groups for the same components. The income distribution narrows in times of growth, primarily because of large elasticities of labor market income among poor heads of household for whom both wages and hours increase during economic upturns. The labor market earnings of women, both as wives and as household heads, are far less responsive to growth. The change in transfer income in response to growth varies enormously between population groups and by type of transfer.

DISAGGREGATING THE EFFECTS OF ECONOMIC GROWTH ON THE DISTRIBUTION OF INCOME

A great deal of political discussion in recent years has focused on the extent to which economic growth helps relatively disadvantaged groups in the United States. While some claim that the best thing we can do for the poor is to make the economy grow, others contend that economic growth passes by many low-income groups and simply leaves them worse off, relative to the rest of the society.

Previous research concerning the effect of the macro economy on the income distribution has shown that both claims have some validity.[1] At an aggregate level, economic growth appears to have some narrowing effect on the income distribution, reducing inequality. But there are specific demographic groups that seem less responsive to a rise in gross national product, in particular, elderly and female-headed households.[2] On the other hand, some groups seem to respond strongly to economic growth, in particular, young and black male-headed households. Unfortunately, these studies have investigated the cyclicality of income change using only very aggregate income measures. No attempt is made to investigate which components of income respond most strongly to the economy and which are least affected.

In contrast, two alternative research approaches have focused on more disaggregate cyclical effects. One group of studies has identified components of the cycle and looked at the effects of unemployment and/or inflation on the aggregate resources of various population groups.[3] A second group of studies has explored the cyclicality of specific income components, such as male wage rates or wives' labor force particiation.[4]

While these studies provide a detailed analysis of a particular economic variable, they are rarely interested in comparing cyclical effects between income groups, or in looking at how the cyclicality of a particular component affects the cyclicality of aggregate income.

This paper disaggregates total household income into a complete set of components, and studies the comparative responses of those components to economic growth. The analysis examines income groups and race, sex, and age groups. The research is designed to provide a more comprehensive picture of the channels by which economic growth produces income change, offering comparative information on the relative responsiveness of major income components both within and across demographic groups. In essence, this study tries to find a methodological middle ground between complete income aggregation (the hallmark of most income distribution studies) and microdata research, which tends to concentrate on particular variables within given populations. The results presented here not only provide new empirical evidence on the effect of the business cycle on income distribution, but also allow comparative statements to be made about the magnitude of cyclical effects across a range of variables and populations.

The results of this research have many policy implications. They indicate which income sources and which population groups are most hurt in recessions, or are least likely to respond to general economic stimulation. This should aid the design and targeting of social welfare programs that attempt to cushion income levels in recessions or that try to stimulate particular types of income growth.

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DEFINING THE PROBLEM

Before describing the data or the methodology in more detail, let me first define the components of income that this research investigates, and second define the population groups of interest. I then outline the questions that will be investigated.

For any household in any given year, total household income can be expressed as

(1) Inc = LIncH + LIncW + Transfers + OthInc,

where LIncH represents the labor income of the household head and can be written as

(2) LIncH = AHE*Hours,

where AHE represents average hourly earnings and Hours represents annual hours of work.[5]

Similarly, LIncW in equation (1) represents labor income of the wife and can be written as

(3) LIncW = AHEW*HoursW,

where AHEW and HoursW represent average hourly earnings and annual hours of work of the wife.

Transfers in equation (1) represents total transfer income from all sources. It can be further decomposed into

(4) Transfers = AFDC + ChSup&A + SocSec + OthRetInc + U&WComp + OthTrans,

where AFDC represents income from Aid to Families with Dependent Children, the primary welfare program available to low-income households

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with children. ChSup&A represents child support or alimony from private sources, while SocSec represents income from the social security program. (This can be either retirement or disability payments.) OthRetInc stands for other retirement income, including all pension funds or annuities exclusive of those received from social security. U&WComp represents income from Unemployment Insurance or Workers' Compensation programs. OthTrans is all other transfer income, and includes cash income from other welfare programs,[6] help from relatives, or other sources of transfer income.

OthInc in equation (1) is the residual category for total income and includes income not contained elsewhere: asset income, rents, dividends, and interest payments. The category also contains the labor market earnings of any household member other than the head or the wife.[7] Equations (1) through (4) present the components of income and of income change on which the rest of this paper will focus.

The above equations are written for individual households. But, as noted earlier, our interest is in the behavior of particular groups of individuals in the population. The twelve household groups investigated here can be divided into three major categories:

Households Grouped by Income	Households Grouped by Race and Gender	Households Grouped by Age of Head
Poor	Headed by black women	Elderly (age>65)
Bottom quartile	Headed by white women	Young (age<24)
Second quartile	Headed by black men	Middle (65≥age≥24)
Third quartile	Headed by white men	
Top quartile		

While most of the categories are self-explanatory, two comments need to be made. "Poor" refers to all households whose total income

is less than 125% of a given "Income/Need Standard." This standard is very close to (although not completely identical with) the official Census Bureau definition of the poverty line.[8] The 125% number is selected because my data set (the Panel Study of Income Dynamics, discussed more fully below) consistently finds more household income than does the Census Bureau. This is the accepted way of defining a poverty standard for these data, which identifies approximately the same population as does the standard Census Bureau definition of poverty.[9] Note also that "poor households" need not be a subset of "bottom quartile households." Some large families may have income levels that place them within the second quartile, but also have needs levels large enough to place them in the poor category as well.[10]

Focusing on the components of income defined above for each of the 12 population groups, I am interested in three primary questions:

1. On average, how do these income components differ over these populations? What is the mean level of each component, and what is the mean share of each component in total income? What secular income changes occur for each population, exclusive of macroeconomic effects?
2. How do these components change as the economy grows? What is the comparative elasticity of each income component to GNP growth within each population? Different measures of change will be used to derive a range of elasticity estimates.
3. Are there changes in the variances of these income components as GNP changes? Many people claim that income variances within groups are likely to widen as the economy grows. According to this "bifurcation" hypothesis, only some members of a group are

able to take advantage of economic growth. This story has frequently been told of black men. If we find evidence that the variance of income components widens for a particular group over the cycle, we will interpret this as supporting the bifurcation hypothesis. In contrast, others claim that economic growth allows those who are behind to "catch up." The unemployed get jobs, and the underemployed work more hours. This might imply that variances among some groups will decrease during economic growth, as those "worse off" have an opportunity to earn more income. Our variance tests will allow us to distinguish between these hypotheses.

DATA

The data used in this study are from the Panel Study of Income Dynamics (PSID), collected by the Survey Research Center at the University of Michigan. I used the survey years 1970 to 1982, which provide data on annual household income from 1969 to 1981. Using the household tape, I extract all the variables necessary to calculate the income components described in equations (1) through (4), as well as a variety of demographic variables, for every household over the entire 13 years. Working with a data set of this size always raises a number of empirical issues. Information on how problems of data inconsistency, household split-offs, and weighting were handled is available from the author upon request.

The advantage of the PSID is that it provides a continuous history of income changes within the same household, allowing one to calculate

how changes in aggregate economic growth translate into changes in household income. However, while there are clear advantages to observing the same household over time, there is a major problem in trying to follow households for several years. Only a small percentage of them fall into the same income or demographic category for an extended period. In particular, female-headed households are formed and dissolve frequently; low-income households move in and out of poverty status; young household heads grow older; and so on. This paper is not concerned with the long-term dynamics of income change for given households. My concern is with the effect of changes in economic growth on income components of households within each of these categories in any year. As a result, rather than follow the same households over the entire time period, I select 12 "adjacent-year" samples, each sample containing all those households whose head remained the same for a two-year period. These range from a 1969/1970 sample to a 1980/1981 sample. Obviously, the 1969/1970 sample looks a great deal like the 1970/1971 sample, and includes many of the same households. But it is not exactly identical, as some changes in heads did occur over these years. (The weighted samples look virtually identical, as they should when the weights are correct.)

Thus I have 12 samples, each containing data on two consecutive years for the same households. I can separate each of these samples into the 12 population groups defined above, where the household is classified according to its total income in the first year of each two-year period, or by the race, sex, or age of its head. Then, for any two-year period, for any population, I can calculate the means and variances of all income variables for both years and the mean differences between

years. Putting together the data from all 12 samples provides a 12-year time series on mean changes in each income component among all members of each population group. Thus, for every two-year period, for every income component, and for every population group, I can derive estimates of means, mean changes, shares, variances, and other variables of interest.[11] These variables can then be related to changes in the general economic growth rate.[12]

OBSERVING THE DATA

Mean Income Components Across Populations

Before estimating the effect of economic growth, this section will investigate the income patterns among the 12 income, age, and race/sex population groups. Equations (1) through (4) define a set of income components that compose total income for any given individual. To calculate means of these income components for an entire population it is necessary to distinguish between the mean level of an income component available among those who receive it, and the mean number of recipients of that component.

In population group j at time t the mean level of any income component, X, among those who receive it is

$$(5) \qquad \overline{X} = \sum_{i=1}^{n_X} X_i/n_X,$$

where n_X is the number of households in group j in year t who receive some income from income source X. (For ease of notation, both the j subscript, indicating population group, and the time subscript,

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indicating year, have been suppressed for the time being. All variables are assumed specific to a given year and population unless otherwise noted.) Thus, when X = LIncH (labor income of the head), $\overline{\text{LIncH}}$ is the average level of labor income received by those household heads with labor income. This implies that mean income, $\overline{\text{Inc}}$, for any year t for any group j can be written as

$$(6) \qquad \overline{\text{Inc}} = (\%\text{LIncH})*\overline{\text{LIncH}} + (\%\text{LIncW})*\overline{\text{LIncW}} + (\%\text{Tr})*\overline{\text{Transfers}} + (\%\text{Oth})*\overline{\text{OthInc}},$$

where (%X) is the percentage of group j in this year for whom income component X is nonzero. If group j has n members and n_X of them receive income component X, then $\%X = n_X/n$. I will look at both the mean level of each income component among its recipients and at the percentage of recipients in the total population.

Income shares among the components of total income can be calculated as the mean of individual income shares across the population. The mean share of total income due to component X for any year t for any group j is

$$(7) \qquad \text{SHARE}(X) = \sum_{i=1}^{n} (X_i/\text{Inc}_i)/n,$$

where n is the number of households in group j in year t.

Mean levels of income components and shares across all 12 years for each population are estimated by averaging the yearly means for each variable across the 12 years. This "mean of the means," denoted with a double bar, implies that for each group j the average level of any income component X for the entire data set is

$$(8) \qquad \bar{\bar{X}} = \sum_{t=1}^{12} \bar{X}_t/12.$$

This calculation can be done for all annual means of income components and income shares.

Table 1 shows the components of total income averaged over the entire 12-year period for all 12 population groups in which I am interested. Shown are the mean (over the 12 years) of the yearly mean for each variable for each population group, as described in equation (8). As indicated above, the mean of each component is calculated only for those individuals who report receiving positive income from that source. Shares are calculated in the manner defined in equation (7).

Part A of Table 1 shows the mean of total income for each group and the share breakdown into its four main components. Part B shows the percentage of households with labor income from the head, and the components of that labor income calculated among those households which receive labor income from the head. Part C shows the percentage of households with labor income from a wife, and the components of wife's labor income calculated from among those households with a working wife. Part D shows the percentage of households receiving transfer income, the mean transfer income among those who receive it, and the share of each of its components among recipients. Some interesting patterns emerge in this table.

First, looking at Part A, it is clear that labor income share increases dramatically as income rises (from 41.1% in the bottom quartile to 80.4% in the top quartile). This is due to an increase in the level of both head's and wife's labor income across income quartiles

Table 1

Components of Household Income
(Averages based on 1969–1981 data, 1981 dollars)

	Poor	Bottom Quartile	Second Quartile	Third Quartile	Top Quartile	Black Women	White Women	Black Men	White Men	Elderly (Age>65)	Young (Age<24)	Middle (65≥Age≥24)
A. Components of Total Mean Income												
Portion of sample	12.4%	25.0%	25.0%	25.0%	25.0%	5.0%	19.7%	8.7%	66.6%	15.8%	7.8%	76.4%
Total mean income	$6,020	$7,153	$16,473	$26,698	$50,274	$10,049	$14,054	$22,462	$29,946	$14,936	$13,489	$28,431
(Std Dev)	(2,339)	(1,807)	(1,743)	(2,142)	(17,312)	(3,769)	(7,223)	(12,404)	(14,902)	(12,654)	(5,095)	(13,826)
Share of total income from:												
Head's labor income	32.6%	38.6%	61.1%	68.6%	65.6%	39.1%	43.3%	61.6%	64.0%	10.3%	73.0%	67.0%
Wife's labor income	2.9	2.5	7.2	11.7	14.8	—	—	13.4	11.9	3.5	8.3	10.3
Transfer income	56.5	50.1	19.9	7.9	3.1	48.3	37.5	16.6	13.4	65.2	14.1	11.5
Other income	8.0	8.8	11.8	11.8	16.5	12.6	19.2	8.4	10.7	21.0	4.6	11.2
B. Components of Household Head's Labor Income												
Household heads with labor income	52.2%	58.2%	82.3%	93.5%	97.3%	60.9%	65.8%	86.5%	89.1%	33.9%	94.5%	91.9%
Head's labor income												
Mean	$4,343	$5,274	$12,379	$19,602	$33,563	$7,309	$10,428	$17,175	$22,252	$6,994	$10,449	$21,248
(Std Dev)	(2,229)	(2,134)	(3,318)	(4,459)	(12,811)	(2,753)	(5,361)	(10,920)	(10,350)	(7,792)	(3,820)	(10,193)
Average hourly earnings												
Mean	$4.04	$4.49	$6.99	$9.68	$15.25	$5.11	$6.68	$8.68	$10.78	$8.23	$6.01	$10.25
(Std Dev)	(2.54)	(3.06)	(3.03)	(3.22)	(6.58)	(1.76)	(3.78)	(5.56)	(5.32)	(8.56)	(1.92)	(4.96)

table continues

and an increase in the probability that the head and wife will work. Small labor income shares among low-income households are hardly surprising. Data not shown on the table reveal that among the poor, 54% of the households are female headed (families with traditionally lower earnings and labor market participation), while 57% report themselves as having some health problem that interferes with work. Among the top quartile, only 4% of the households are female-headed, and only 15% report such health problems. The increase in the share of wife's labor income across income levels is due to the increase in level of income earned by wives who work, an increase in the percentage of wives who work, and an increase in the percentage of heads who are married (see row 1, Part C). Part A shows that the share of total income from transfers decreases dramatically over the income scale, while the share of "other income" increases.

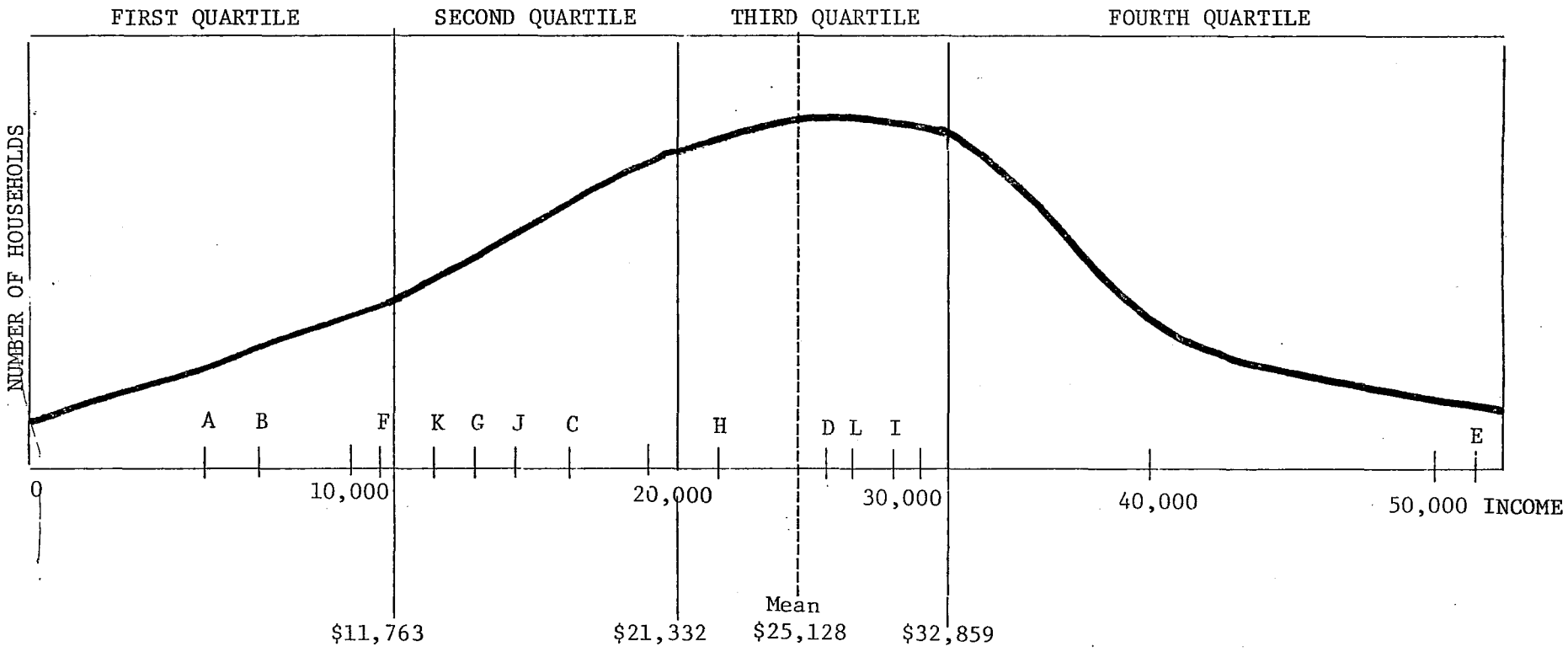
Figure 1 shows how the mean incomes of these groups relate to each other. Mean income for the entire population is $25,128, and the break-points between the quartiles are $11,763, $21,332, and $32,859. While many people are grouped near the mean, there is a large and extended tail in the top quartile.

Like low-income families in general, black and white female-headed households receive a relatively low percentage of their income from the labor market, as do the elderly. In contrast, black men and the young rely heavily on the labor market. We would expect, a priori, that growth in the economy would initially help those groups who are closely tied to the labor market more than it helps others. As noted above, previous research has indicated that female- and elderly-headed households are less responsive to economic changes.

FIGURE 1

MEAN INCOME LEVELS OF POPULATION GROUPS

(averages based on 1969-1981 data, 1981 dollars)



Mean Income for:

A.	Poor	$6,020	F.	Black Females	$10,048	J.	Elderly	$14,936
B.	First Quartile	$7,153	G.	White Females	$14,054	K.	Young	$13,489
C.	Second Quartile	$16,153	H.	Black Males	$22,462	L.	Middle-aged	$28,431
D.	Third Quartile	$26,698	I.	White Males	$29,946			
E.	Fourth Quartile	$50,274						

Among the poor, the very low amount of labor market income received (Table 1, Part A) might indicate that this group also is less affected by economic growth. The "trickling down" hypothesis does not look promising when less than 36% of the income of the poor is directly tied to the labor market. In order for the poor to gain relative to other groups, the increase in labor income and labor market participation following an increase in GNP must be very large for low-income workers.

Part B shows the mean levels and standard deviations for the components of household head's labor income. This table indicates first that wage differentials among groups are greater than hours differentials. For instance, average hourly earnings among the top quartile are 3.4 times greater than average hourly earnings among the bottom quartile. The comparative figure for hours in these groups is 1.6.[13] This is also true between race and sex groups, where wage levels vary more than hours.

Part C shows mean levels and standard deviations for the components of wife's labor income, which basically demonstrate the same patterns observed for household head's labor income, but with smaller differences between the groups. The relative wages of the wives in wealthier households are higher than the wages of wives of the bottom quartile, but the difference is less than is found among head's wages. Thus, while there is some positive correlation between the earnings of husbands and wives (i.e., high-earning husbands have high earning wives) that correlation is not perfect.

Wives of black men earn higher wages than black women who are heads of households, but they work fewer hours. Wives of white household heads earn about the same wage as white women heading households, but also work

Table 1, continued

	Poor	Bottom Quartile	Second Quartile	Third Quartile	Top Quartile	Black Women	White Women	Black Men	White Men	Elderly (Age>65)	Young (Age<24)	Middle (65≥Age≥24)
B. Components of Household Head's Labor Income, cont.												
Annual hours												
Mean	1,278	1,398	1,929	2,146	2,305	1,437	1,570	2,011	2,131	961	1,757	2,110
(Std Dev)	(539)	(547)	(487)	(437)	(425)	(375)	(522)	(440)	(496)	(595)	(449)	(462)
C. Component of Wife's Labor Income												
Household heads married	32.5%	29.9%	59.5%	78.7%	91.0%	—	—	79.4%	86.7%	51.1%	40.9%	70.1%
Heads with working wives	10.6%	9.4%	27.1%	45.5%	59.8%	—	—	48.5%	46.8%	11.9%	28.7%	41.1%
Wife's labor income												
Mean	$2,227	$2,302	$4,555	$7,002	$11,529	—	—	$7,293	$8,273	$6,915	$5,885	$8,381
(Std Dev)	(1,153)	(1,207)	(2,115)	(3,017)	(4,814)			(3,121)	(4,294)	(4,826)	(2,265)	(4,213)
Average hourly earnings												
Mean	$3.27	$3.56	$4.58	$5.75	$8.26	—	—	$5.48	$6.59	$5.77	$4.87	$6.60
(Std Dev)	(1.17)	(2.00)	(2.32)	(2.24)	(3.78)			(2.24)	(3.36)	(3.40)	(1.55)	(3.27)
Annual hours												
Mean	793	810	1,103	1,284	1,453	—	—	1,384	1,277	1,208	1,202	1,301
(Std Dev)	(367)	(418)	(439)	(450)	(448)			(397)	(465)	(597)	(342)	(456)
D. Components of Transfer Income												
Households receiving transfers	74.9%	73.0%	49.0%	32.7%	20.2%	72.6%	68.1%	39.6%	35.0%	95.8%	46.5%	32.8%

table continues

less. The elderly are the only group for whom labor income of the wife is about equal to the labor income of the household head. But elderly wives earn a lower wage than their husbands, making up the difference by working more hours.

Finally, Part D shows mean transfer levels among the groups and the relative shares of the six components of transfer income. The patterns are predictable, given the nature of these income sources. AFDC is (by definition) most important for low-income, female-headed, and nonelderly households. Child support is most important for middle-income households and women. Social security is important for all groups, but particularly for the elderly and those of low income. Other retirement income is most important among higher-income households. Unemployment Insurance and Workers' Compensation is most important to the middle-income and young households.

I was rather surprised by the percentage of households receiving some form of transfer income. Among the poor, close to one quarter receive no transfers--a number that I find surprisingly high.[14] Among the top quartile, one fifth of households still receive transfer income, though largely in the form of nonwelfare transfers, such as other retirement income.

Secular Income Changes

Table 1 shows the average annual patterns among income components for these groups. However, the focus of this paper is on changes in income. Thus we turn next to average annual income changes among the different populations. The business cycle effects are those general

Table 1, continued

	Poor	Bottom Quartile	Second Quartile	Third Quartile	Top Quartile	Black Women	White Women	Black Men	White Men	Elderly (Age>65)	Young (Age<24)	Middle (65≥Age≥24)
D. Components of transfer income, cont.												
Total transfer income												
Mean	$3,672	$4,159	$5,839	$5,574	$5,905	$4,309	$5,592	$3,948	$5,740	$7,138	$2,181	$4,271
(Std Dev)	(1,324)	(1,697)	(3,343)	(3,946)	(4,507)	(1,573)	(2,337)	(1,999)	(3,727)	(3,378)	(1,256)	(2,854)
Share of total transfer income from:												
AFDC	16.1%	9.1%	4.1%	2.4%	1.0%	29.6%	5.8%	6.3%	1.4%	.1%	15.7%	9.2%
Child support or alimony	3.3	2.9	8.1	7.4	7.0	6.1	13.0	.3	.9	.1	3.1	10.0
Social security	44.7	53.1	38.6	27.0	25.8	26.4	48.6	35.7	41.5	70.7	10.5	23.1
Other retirement income	8.2	11.3	21.6	27.7	33.2	5.7	15.4	17.2	24.0	12.6	2.8	18.7
Unemployment Ins. or Workers' Comp.	3.6	4.4	11.1	17.0	14.5	3.0	3.7	14.4	13.5	.6	20.6	14.9
Other transfer income	24.1	19.3	16.4	18.4	18.5	29.2	13.5	26.0	18.7	6.9	47.3	24.1

Source: Author's calculations from Michigan Panel Study of Income Dynamics, survey years 1970-1982.

Note: "Poor" refers to a measure close to the official (Census Bureau) poverty threshold; quartiles refer to the income distribution; remaining column headings refer to the characteristics of heads of household.

income changes related to the macroeconomy that occur in addition to the underlying average income changes which these populations experience in any given year.

For the population as a whole over these 12 years, real median income was effectively stagnant.[15] Thus, one would expect mean changes over this time period to be zero, unless secular income changes occurred within particular groups. For example, one might expect that there will be regression towards the mean, so that on average low-income households in any given year will experience income improvement, while richer households lose income. Among the elderly one might on average expect income decreases, while among the young one would expect increases. It is important to remember that this data set is designed to measure the mean changes for individuals in each group in each year--not the mean change for the same individual over the years. Thus, the mean changes reported here are the average annual changes for any household in a given population group during this 12-year period.

Mean changes in income components can be calculated for any population group over any two-year period using the 12 two-year samples. The mean change between any two years t and t+1 for population j is

$$(9) \qquad \text{CHANGE}(X) = \sum_{i=1}^{n} (X_{i,t+1} - X_{i,t})/n$$

$$= (n_2/n)*\bar{X}_{t+1} - (n_1/n)*\bar{X}_t,$$

where n is the total number of households in group j, n_1 is the number of those households receiving income component X in year t, and n_2 is the number of households in the same sample receiving income component X in year t+1. For ease of notation I will write

(9a) $\quad CHANGE(X) = X_{t+1,t}.$

The mean secular change averaged across all 12 two-year periods is then

$$(10) \qquad \Delta X = \sum_{t=1}^{12} \Delta X_{t,t+1}/12.$$

The share of total income change attributable to a change in component X is the mean change share,

$$(11) \qquad ChSHARE(X) = \sum_{i=1}^{n} [(X_{i,t+1} - X_{i,t})/(Inc_{i,t+1} - Inc_{i,t})]/n.$$

Table 2 shows these annual average changes in the components of total income for each population group. The mean changes in Table 2 are calculated according to equation (10), and the components of income change are based on equation (11).

Table 2 reveals a strong tendency for regression to the mean among high- and low-income groups. Any household that is poor can expect on average a rise in income the next year of $2150, or 36%. For any household in the top quartile, income is expected on average to decrease by $1825 in any year, or -3.6%. Little average change occurs among the middle two quartiles or among the race/sex groups. The elderly and young show the expected patterns, the young on average showing income gains in any two-year period while the elderly experience income losses.

The bulk of the changes in total income that are experienced are clearly due to changes in labor income of the household head. Average changes in wife's income are less closely related to household income

Table 2

Components of Secular Change in Mean Annual Income
(Based on 12 two-year samples from 1969/1970 to 1980/1981, in 1981 dollars)

	Poor	Bottom Quartile	Second Quartile	Third Quartile	Top Quartile	Black Women	White Women	Black Men	White Men	Elderly (Age>65)	Young (Age<24)	Middle (65≥Age≥24)
Total Income												
Mean change	$2,150	$1,558	$1,025	$474	-$1,825	$20	-$243	$249	$499	-$277	$1,620	$277
Mean % change	35.8%	21.8%	6.3%	1.8%	-3.6%	0.3%	-1.7%	1.1%	1.7%	-1.8%	12.0%	1.0%
Head's labor income												
Mean change	1,172	855	456	-1	-1,198	140	127	-58	-1	-484	1,436	-21
Mean % change	27.0	16.2	3.7	-.02	-3.5	1.9	1.3	-.3	-.04	-7.1	13.8	-.1
Wife's labor income												
Mean change	133	121	213	75	-328	—	—	46	23	-110	219	26
Mean % change	6.1	5.3	4.7	1.1	-2.8			.7	.3	-1.6	3.7	.3
Transfer income												
Mean change	198	146	98	152	190	4	112	131	170	233	-20	151
Mean % change	5.4	3.6	1.7	2.7	3.3	.2	2.5	3.3	3.0	3.4	-.9	3.5
Share of Total Income Change Attributable to[a]												
Change in head's labor income	55.3%	54.8%	42.3%	-.7%	-68.4%	597.1%	60.4%	-14.4%	1.3%	-184.7%	81.4%	-4.3%
Change in wife's labor income	6.9	10.2	27.3	32.2	-13.8	—	—	40.5	22.5	-38.4	23.5	31.6
Change in transfer income	10.5	9.8	7.2	25.1	8.5	-41.2	4.1	45.5	30.1	72.3	-1.4	40.5
Change in other income	27.3	25.2	23.2	43.4	-26.3	-455.9	-164.5	28.5	46.1	50.8	-3.5	32.2

Note: See Table 1 for explanation of column headings and data source.

[a]Shares of net positive changes sum to 100% (with occasional rounding error). Shares of net negative changes sum to -100%.

patterns and are much smaller. Note that there is a general secular increase in transfer income over this time period. Though we will not explore this further, this is largely due to increases in social security income for most groups. (The social security system expanded dramatically over these years.)

Table 2 shows that there is quite a bit of dynamic income change among these population groups in any given year, regardless of economic growth conditions. The rich have a tendency to become poorer, while the poor have an even stronger tendency to become richer. Thus, when we now turn to look at the effect of GNP growth on income change, we are really seeking to find effects in addition to those that are secular. In other words, we want to determine the additional effect of general economic growth on the income dynamics of these population groups.

THE RESPONSIVENESS OF INCOME COMPONENTS TO THE CYCLE

This research requires that a general macroeconomic variable (GNP growth) be related to specific microeconomic concepts, such as wage rates or hours of work. The most obvious response--to enter GNP growth into microdata regressions that attempt to estimate wages or hours--has been shown many times to be ineffective. The range of variation in individual responses is almost always so great that aggregate variables rarely appear to be significant.[16]

So the approach in this paper needs to be different. The methodology outlined below is one relatively simple way of combining a great deal of data on individual households into more aggregate variables which are more readily compared with GNP growth rates. In particular, we will

aggregate changes in income components within individual households in each population group.

Our primary interest is in the comparative responsiveness of different income sources to economic growth among the 12 populations. This requires estimating relative changes with respect to GNP. This can be done by regressing changes in each income component for each population group against percentage change in GNP (and a constant) across the 12 time periods.[17]

I choose to use two measures of the relative responsiveness of each income component to GNP. The first is the percentage change in a given component induced by a 1% change in GNP. The second is the absolute or level change in a given component induced by a 1% change in GNP. These two measures provide complementary information on the effects of the economic cycle, as described below.

The percentage change in the level of income component X is calculated over the entire population for each two-year period. This means that it explicitly includes both the recipients of X as well as the nonrecipients in its calculation, thus allowing changes to occur both in the number of recipients and in the level of X among recipients. Define this total percentage change for year t and population j as[18]

$$(12) \qquad PctCh(X)_t = \sum_{i=1}^{n} (X_{i,t+1} - X_{i,t}) / \sum_{i=1}^{n} X_{i,t}.$$

Using the notation defined in equation (9a) above, this can also be written as

$$(12a) \qquad PctCh(X)_t = \Delta X_{t+1,t} / (n_1/n)\overline{X}_t.$$

If I regress the percentage change in variable X from each of the 12 two-year samples against a constant and the percentage change in GNP over these same years, the coefficient on GNP will provide an elasticity estimate. This is the regression

$$(13) \qquad PctCh(X)_t = \alpha_1 + \alpha_2 PctGNP_t + e_t,$$

where $PctGNP_t = (GNP_{t+1} - GNP_t)/GNP_t$

and e is a random error term. The coefficient α_2 will indicate how responsive income component X is to general macroeconomic growth and can be interpreted as the percentage change in X due to a 1% increase in GNP.[19]

However, this percentage elasticity has certain limitations. While it is useful in comparing the responsiveness of different income components both across and within population groups, it can appear misleading if viewed alone. When percentage changes are calculated from numbers with large base levels, even small proportional changes can imply large absolute changes, while the opposite happens when the base level is small. Since the different income components vary widely in their level values, I present not only the percentage change but also the level change associated with changes in GNP.

The level change for income component X for population j in year t is the numerator of the percentage change calculation in equation (12):

$$(14) \qquad LevCh(X)_t = \sum_{i=1}^{n} (X_{i,t+1} - X_{i,t})/n.$$

This measure can also be regressed against the percentage change in GNP,

$$(15) \qquad \text{LevCh}(X)_t = \beta_1 + \beta_2 \text{PctGNP}_t + u_t,$$

where PctGNP is defined as before and u is a random error term. The coefficient β_2 will measure the mean dollar increase in income component X (among all households in population j) associated with a 1% change in GNP.

Table 3 presents estimates of α_2 and β_2. (Constants are included in all regressions, but not reported here.) Panels A-1 through D-1 indicate the percentage change elasticities of all income components to GNP growth, while panels A-2 through D-2 present the level-change elasticities. Part A reports the results for the components of total income, Part B shows the results for the components of head's labor income, Part C shows the elasticities for components of wife's labor income, and Part D shows elasticities for components of transfers.

Part A indicates how the aggregate components of income vary with GNP. There are some striking patterns in this table. First, total income among low-income groups shows far greater percentage increases than among high-income groups. As other studies have shown, these results confirm that increases in GNP growth proportionately narrow the income distribution. However, the large percentage changes in panel A-1 must be offset by looking at the level elasticities in panel A-2. Perhaps not surprisingly, absolute dollar changes are much larger among upper-income groups. A 1% increase in GNP, leading to a 1.6% increase in income for the average poor household, means an extra $109 to spend over the year. The top quintile household, whose income increases only .85%, gets an additional $433 to spend.

Table 3

Elasticities of Income Components

	Poor	Bottom Quartile	Second Quartile	Third Quartile	Top Quartile	Black Women	White Women	Black Men	White Men	Elderly (Age>65)	Young (Age<24)	Middle (65≥Age≥24)
A-1: Percentage Change in Components of Total Income Due to 1% Change in GNP												
Total income	1.61**	1.30**	.97**	.82**	.85**	.42	.49*	1.07**	.96**	.64*	1.14*	.94**
	(.27)	(.33)	(.23)	(.14)	(.25)	(.46)	(.30)	(.26)	(.18)	(.41)	(.60)	(.16)
Head's labor income	3.05*	2.27**	1.44**	1.24**	.85**	.35	.76*	1.26**	1.16**	.68	1.18*	1.14**
	(1.18)	(.41)	(.23)	(.11)	(.20)	(.57)	(.31)	(.36)	(.17)	(.86)	(.56)	(.15)
Wife's labor income	.23	.48	.32	.22	.30	—	—	.86*	.22	-.90	1.66	.31
	(2.90)	(2.62)	(.62)	(.60)	(.29)			(.49)	(.32)	(.75)	(1.45)	(.30)
Transfer income	-.37	.09	-.86*	-1.78*	.55	-.82	.56	-1.59*	-.87*	.78*	-2.92**	-1.56**
	(.49)	(.51)	(.53)	(.66)	(.95)	(.70)	(.56)	(1.17)	(.48)	(.54)	(.81)	(.40)
Other income	3.57	3.55*	1.70*	.67	1.45	2.31*	.21	1.85	1.79*	.93	6.68*	1.48*
	(3.67)	(2.34)	(1.04)	(1.17)	(1.14)	(1.65)	(.90)	(1.51)	(.95)	(1.17)	(3.36)	(.93)
A-2: Level Change in Components of Total Income Due to a 1% Change in GNP												
Total income	$109**	$96**	$160**	$223**	$433**	$43	$68	$244**	$285**	$96	$160	$266**
	(25)	(28)	(35)	(39)	(132)	(46)	(43)	(59)	(54)	(62)	(82)	(46)
Head's labor income	82**	71**	146**	230**	280**	13	54	189**	231**	9	125	225**
	(21)	(16)	(20)	(22)	(67)	(25)	(21)	(53)	(33)	(24)	(52)	(30)
Wife's labor income	1	-.1	4	8	22	—	—	30	9	-7	21	12
	(6)	(5)	(9)	(19)	(21)			(17)	(13)	(7)	(30)	(10)
Transfer income	-8	3	-20*	-29*	8	-29	17	-21	-15*	52*	-30**	-19**
	(13)	(14)	(12)	(12)	(10)	(25)	(16)	(18)	(7)	(35)	(9)	(5)
Other income	28*	22*	30*	17	129	50*	1	43	62*	39	47*	52*
	(11)	(10)	(20)	(40)	(109)	(32)	(38)	(36)	(40)	(53)	(21)	(37)

table continues

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Second, there are some groups whose income is quite unresponsive to changes in GNP. Female-headed households and the elderly have very low elasticities and gain little from economic growth. On the other hand, black male-headed households and the young have very high elasticities, gaining in relative income. This meshes with the patterns that other reseachers have reported.

Third, the driving force behind these patterns in total income is the elasticity of the household head's labor income. Percentage changes are consistently larger for the head's labor income than for total income. The only exception is among black female-headed households. Clearly, the smaller share of total income due to labor earnings among low-income households (seen in Table 1) is offset by the very high relative elasticities of the head's earnings, leading to a net narrowing effect in the income distribution as the economy grows.

Fourth, wife's labor income seems quite unresponsive to macroeconomic change. Among almost all groups this income component shows small, positive, but insignificant effects. Only the wives of black men and young men have labor market incomes that appear to increase proportionately with the economy. The wives of elderly men actually show a relatively large decline.

Finally, transfer income shows mixed effects. Among the poorest groups transfers appear relatively unresponsive to GNP growth. Among middle-income groups, including male-headed households and young and middle-aged households, transfer income declines in the face of economic improvement, as one might expect.

Part B of Table 3 looks at the cyclicality of the components of head's labor income. Notice that the large percentage changes in that income among low-income groups are due to higher elasticities of both hourly earnings and hours of work. Among the poor a 1% increase in GNP increases wages 2.57%, or 6 cents an hour, and increases annual hours of work by 1.25%, or 9 hours. Both of these effects decrease as income rises. Female-headed households--black and white--have the lowest elasticity of earnings.

These results contrast somewhat with many of the theories of fixed wage/variable employment contracts that are often used to describe the labor market, and with macroeconomic studies indicating that aggregate real wages are largely unaffected by cyclical change.[20] Both wages and hours move over the cycle, at least within this data set, although the changes in hours are estimated with greater precision. This finding is not singular, however. Estimation by Bils (1984), with the National Longitudinal Study of Young Men, finds significant aggregate wage cyclicality. Raisain (1979, 1983) has also found wage cyclicality among some groups of men in the PSID. Unlike most previous studies, this paper uses a measure of wages which includes <u>all</u> labor market income (including overtime and second jobs). It also embeds movement into and out of the labor market.[21] Both of these will increase the cyclicality in my wage measure. In general, the relation between wages and the business cycle is still an area open to new research.

Part C shows the components of wife's labor income and reveals patterns very different from head's earnings. Some wives appear to gain income over the cycle through large wage increases. Wives' average

Table 3, continued

	Poor	Bottom Quartile	Second Quartile	Third Quartile	Top Quartile	Black Women	White Women	Black Men	White Men	Elderly (Age>65)	Young (Age<24)	Middle (65≥Age≥24)
B-1: Percentage Change in Components of Head's Labor Income Due to 1% Change in GNP												
Average hourly earnings	$2.57* (1.18)	$1.55* (.70)	$.85* (.40)	$.64* (.31)	$.65* (.30)	$.35 (.58)	$.62* (.46)	$.62 (.58)	$.81** (.25)	$-.78 (1.40)	$.73* (.45)	.86** (.22)
Annual hours	1.25* (.91)	1.08** (.33)	.75** (.18)	.52** (.13)	.24** (.07)	.67* (.48)	.68** (.22)	.63* (.28)	.53** (.07)	.21 (.68)	.86** (.23)	.55** (.09)
B-2: Level Change in Components of Head's Labor Income Due to a 1% Change in GNP												
Average hourly earnings	$.06* (.02)	$.04* (.02)	$.05* (.02)	$.06* (.03)	$.10* (.04)	$.01 (.02)	$.03* (.02)	$.05 (.04)	$.08** (.02)	$-.02 (.04)	$.04* (.03)	$.08* (.02)
Annual hours	9* (4)	9** (2)	12** (3)	11** (3)	5** (1)	6* (4)	7** (2)	11* (5)	10** (1)	1 (3)	14** (4)	11** (2)
C-1: Percentage Change in Components of Wife's Labor Icome Due to a 1% Change in GNP												
Average hourly earnings	4.09* (2.22)	3.70* (2.03)	2.69* (1.04)	-.86 (.73)	.26 (.56)	—	—	1.12 (1.08)	.34 (.35)	.94 (1.17)	1.67* (.90)	.32 (.40)
Annual hours	-1.02 (1.84)	.33 (1.45)	-.12 (.58)	.24 (.59)	-.16 (.34)	—	—	.26 (.50)	-.03 (.31)	-.58 (.63)	1.08 (1.07)	.001 (.32)
C-2: Level Change in Components of Wife's Labor Income Due to a 1% Change in GNP												
Average hourly earnings	$.01* (.01)	$.01* (.01)	$.03* (.01)	$-.02 (.02)	$.01 (.03)	—	—	$.03 (.03)	$.01 (.01)	$.01 (.01)	$.02* (.01)	$.01 (.01)
Annual hours	-1 (2)	.2 (1)	-.3 (2)	1 (3)	-1 (3)	—	—	2 (3)	-.1 (2)	-1 (1)	3 (4)	.03 (2)

table continues

hourly earnings show strong percentage increases in households with low income or young busbands, though these effects drop off rapidly at higher income levels. However, this translates into relatively small changes in actual wages received, because many wives do not work and earnings were not high to begin with, so that the level change in wages is approximately the same for women across all income categories.[22] This further underscores the fact that women seem to be in jobs which are unresponsive to cyclical effects, protecting them against downturns, but also preventing them from gaining during upturns.

Cyclical effects on wives' annual hours are generally small. Past research has attempted to determine whether discouraged or added-worker effects dominate labor supply behavior among married women (i.e., whether women leave or enter the labor force during economic downturns).[23] In Table 3, these two effects appear to cancel each other out, with two exceptions. Wives in poor households appear to be added workers (a 1% increase in GNP leads to a 1.02% decrease in hours worked.) Wives of young men seem to have an opposite response, increasing participation as the economy expands. However, none of these effects is well-determined.

Finally, Part D shows cyclical elasticities for the components of transfer income. Receipt of transfers declines mildly among low-income groups and rises strongly among richer groups. AFDC receipt is negatively correlated with economic upturns, while child support and alimony, along with other retirement income and social security, are positively correlated. (As noted above, this is partly due to legislative changes in social security, which coincided with business-cycle effects.)

Table 3, continued

	Poor	Bottom Quartile	Second Quartile	Third Quartile	Top Quartile	Black Women	White Women	Black Men	White Men	Elderly (Age>65)	Young (Age<24)	Middle (65≥Age≥24)
D-1: Percentage Change in Components of Transfer Income Due to 1% Change in GNP												
AFDC	-1.95*	-2.12*	-4.51*	-2.04	-7.58	-2.05*	-2.84*	-.17	-5.01	-19.50	-9.30*	-2.07*
	(1.02)	(1.11)	(2.48)	(3.77)	(7.11)	(1.46)	(.96)	(4.42)	(4.88)	(19.53)	(5.72)	(1.10)
Child support or alimony	.66	1.81	-.52	-.10	4.00	-5.36	1.72*	-15.19	2.26	113.47*	-19.91**	.77
	(2.20)	(1.83)	(1.46)	(2.78)	(4.09)	(5.88)	(.85)	(18.38)	(10.24)	(80.94)	(6.91)	(1.08)
Social security	1.92*	1.12	-.13	-.38	4.42	1.94	1.13	1.90*	.35	.97	-13.12	.42
	(.95)	(1.17)	(1.60)	(2.73)	(3.62)	(1.62)	(1.39)	(1.43)	(1.93)	(1.29)	(23.62)	(2.43)
Other retirement income	-.13	.25	1.18	1.25	3.75*	-.17	2.00*	.70	1.50*	1.30*	42.72*	2.18*
	(2.13)	(.77)	(1.32)	(1.19)	(1.72)	(3.98)	(1.07)	(2.50)	(1.14)	(.72)	(27.53)	(1.47)
Unemployment Ins. or Workers' Comp.	-11.09**	-12.29**	-7.03**	-20.32**	-19.66**	-4.47	-7.60**	-16.44**	-15.72**	-8.94	-24.71**	-11.96**
	(4.05)	(2.08)	(1.35)	(3.03)	(6.72)	(8.56)	(2.93)	(6.05)	(2.90)	(38.46)	(4.69)	(1.87)
Other transfer income	-1.72	-.64	-5.57*	-8.42*	-3.34	-1.70	-1.44	-4.14*	-5.76*	-4.54	1.30	-4.58*
	(1.70)	(1.74)	(3.36)	(4.69)	(5.22)	(2.14)	(3.17)	(2.65)	(3.43)	(5.65)	(2.47)	(2.07)

table continues

Table 3, continued

	Poor	Bottom Quartile	Second Quartile	Third Quartile	Top Quartile	Black Women	White Women	Black Men	White Men	Elderly (Age>65)	Young (Age<24)	Middle (65≥Age≥24)
D-2: Level Change in Components of Transfer Income Due to 1% Change in GNP												
AFDC	$-13*	$-7*	$-5*	$-.1	$-1	$-28*	$-6**	$-3	$-1	$-1	$-10*	$-3*
	(6)	(3)	(2)	(1)	(1)	(17)	(2)	(8)	(1)	(1)	(5)	(1)
Child support or alimony	.3	1	-.1	-.1	1	-2	7*	-.2	1	1*	-3*	1
	(2)	(1)	(2)	(2)	(2)	(7)	(3)	(.5)	(1)	(1)	(1)	(1)
Social security	23*	22	-7	-4	10*	16	17	13*	9	46	-4	4
	(11)	(17)	(17)	(13)	(7)	(12)	(17)	(9)	(14)	(47)	(7)	(7)
Other retirement income	-1	1	10	9	19*	-3	12*	3	11*	28*	4	8*
	(4)	(3)	(10)	(8)	(8)	(8)	(7)	(9)	(7)	(15)	(6)	(5)
Unemployment Ins. or Workers' Comp.	-8**	-13**	-14**	-23**	-9**	-1	-7**	-21*	-17**	-9*	-28**	-14**
	(3)	(3)	(3)	(4)	(3)	(4)	(2)	(8)	(2)	(3)	(6)	(2)
Other transfer income	-10	-2	-19	-19	-13	-12	-7	-12*	-16	-16	10	-14
	(10)	(9)	(15)	(14)	(12)	(18)	(12)	(8)	(13)	(34)	(11)	(7)

Note: Standard errors in parentheses. Constants included in all regressions but not reported. See Table 1 for explanation of column headings.

*Significant at .1% level.
**Significant at .01% level.

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Unemployment Insurance has a strong negative correlation with GNP growth, particularly among young and white male-headed households. For the elderly, who rely heavily on social security income, there is little correlation between this income source and economic growth, although their other retirement income rises strongly when the economy expands. Black female-headed households seem to experience more decline in transfers than white female-headed households, although both rely heavily on a very similar mix of transfers. Young, black, male-headed households and the upper quartiles appear to experience the greatest cyclicality in their transfer components. In absolute levels, declines in unemployment and workers' compensation and increases in social security are clearly the largest transfer changes seen over the cycle for most groups.

The regression results reported in Table 3 are quite simple in their form, containing just a constant and the percentage change in GNP. A few more complex specifications have been tried. A test of the symmetry of cyclical effects was run, separating the elasticity effects in the years in which GNP increased from the years in which it decreased. For no variable or population group did this produce a significantly different result from those reported here.

More informative was the addition of a nonlinear term, the square of the percentage change in GNP. This was insignificant for all except female workers. For female household heads and for the wives in elderly and poor households, the nonlinear term had a significant negative effect on labor market income, primarily via significant negative effects on hours of work. This appears to indicate that these women, while gaining from the initial stages of a cyclical upturn, do not

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continue those gains at higher growth levels. Their ability to profit from continued economic growth falls off rapidly. These results are consistent with the theory that female household heads and wives often have significant nonmarket claims on their time (such as children) that prevent them from making large increases in work hours when employment opportunities expand.

The estimates in Table 3 combine the effects of cyclical changes in labor market participation (or transfer income recipiency) with the cyclical changes in levels of income among participants. To understand how these two effects break down, elasticities on labor market participation and transfer income recipiency rates alone are presented in Table 4. Reported are the elasticities of the percentage of the population in each designated category in response to a 1% change in GNP. For instance, Table 4 indicates that among the poor, a 1% increase in GNP increases the percentage of households with working heads by .5, the percentage of households with working wives by .42, and decreases the percentage of households with transfers by .3.

The primary conclusion from Table 4 is that changes over the cycle in the percentage of households with working heads or wives are generally small and not highly significant. Approximately 1/2 of 1 percent of poor household heads and black women heading households take a job when the economy grows 1%. The effects for other groups are much smaller. (Although, surprisingly, they are significant among top quartile, white male-headed, and middle-aged households.) Among wives, added- or discouraged-worker effects appear for different groups, but they are small and largely insignificant. There is a tendency for wives of low-

Table 4

Elasticities of Labor Force Participation Rates and Transfer Income Recipiency: Response to a 1% Change in GNP[a]

	Poor	Bottom Quartile	Second Quartile	Third Quartile	Top Quartile	Black Women	White Women	Black Men	White Men	Elderly (Age>65)	Young (Age<24)	Middle (65≥Age≥24)
Proportion of households with head working	.48 (.47)	.34* (.21)	.16 (.17)	.002 (.09)	.12* (.06)	.52* (.29)	.14 (.21)	.07 (.15)	.13* (.06)	−.31 (.74)	.17 (.15)	.17** (.04)
Proportion of married households with wife working	.42 (1.42)	.66 (1.03)	.45 (.46)	−.22 (.56)	−.42* (.29)	—	—	.29 (.45)	−.16 (.36)	−.36 (.62)	.33 (.40)	−.13 (.38)
Proportion of households with transfer income	−.30 (.26)	−.19 (.21)	−1.21** (.33)	−3.20** (.82)	−1.86* (1.14)	−.38 (.33)	−.36 (.33)	−2.65* (1.28)	−1.51** (.44)	.18* (.13)	−1.11 (.96)	−1.97** (.55)

Note: Standard errors in parentheses. Constant included in all regressions but not reported. See Table 1 for explanation of column headings.

[a]Reported coefficients represent the change in percent of households due to a 1% change in GNP.

*Significant at .1% level.
**Significant at .01% level.

income groups to be added workers while wives of high-income groups are discouraged workers, a finding consistent with the research cited above.

The percentage of households receiving transfer income shrinks with GNP growth. These effects are especially large among higher-income groups. Recipiency of transfer income among poorer households declines mildly in the face of economic growth.

Table 4 indicates that the elasticity effects presented in Table 3 are largely the result of changes in the levels of hours and wages among workers, or the level of transfers among recipients. While cyclicality in labor force participation and transfer recipiency occurs, it is relatively small for most groups.

VARIANCE ELASTICITIES

The results in Table 3 indicate that there are significant differences in the response of income among these 12 populations to macroeconomic change. This section investigates whether there are further divergences among income components within each population group over the cycle by looking at the change in the coefficient of variation of these income components as GNP changes. As noted above, there are reasons to believe that variance in some groups will increase with growth (a bifurcation among groups), and other arguments that variances will decrease (the bottom catches up.) I use the coefficient of variation to measure this effect since it is invariant to changes in the mean.[24]

The coefficient of variation can be calculated in a straightforward manner for each income component among all individuals in each population group in each two-year sample. The coefficient of variation of income component X for population j in year t is

$$(16) \qquad CVar(X)_t = [\sum_{i=1}^{n_X} (X_{i,t} - X_t)^2/n_x]^{1/2} \; / [\sum_{i=1}^{n_X} X_i/n_x].$$

where n_x households in group j in this year receive income component X.

Elasticities are calculated by regressing percentage change in the coefficient of variation of each income component against percentage change in GNP (and a constant.) The percentage change in the coefficient of variation is calculated within each two year sample using its value for each year,

$$(17) \qquad CVarCh(X)_t = [CVar(X_{t+1}) - CVar(X_t)] \; / \; CVar(X_t).$$

The percentage change in the coefficient of variation of X as GNP changes is determined in the regression equation

$$(18) \qquad CVarCh(X)_t = \gamma_1 + \gamma_2 PctGNP_t + v_t,$$

where PctGNP is defined as before and v is a random error term. Table 5 presents my estimates of γ_2, showing the percentage change in coefficient of variation resulting from a 1% change in GNP for each income component.

The dominant conclusion from Part A of Table 5 is that short-term cyclical growth not only narrows the income distribution between these population groups, but also narrows the income dispersion within these groups. Among almost all groups a significant decrease in the coefficient of variation of total income occurs as the economy grows. Only black women heading households show a small and insignificant change. (White women who are households heads also show a relatively small change, although it is significant.) The poor show a larger effect, but it is poorly estimated with a large standard error.

Table 5

Elasticities for the Coefficient of Variation of Income Components: Response to a 1% Increase in GNP

	Poor	Bottom Quartile	Second Quartile	Third Quartile	Top Quartile	Black Women	White Women	Black Men	White Men	Elderly (Age>65)	Young (Age<24)	Middle (65≥Age≥24)
A: Mean Elasticities for the Coefficient of Variation of Total Income Components												
Total income	-.94	-.90**	-.90**	-.82**	-.92**	-.44	-.52*	-1.03**	-.93**	-.71*	-.97*	-.92**
	(.90)	(.21)	(.21)	(.15)	(.26)	(.45)	(.31)	(.28)	(.17)	(.42)	(.50)	(.15)
Head's labor income	-1.98**	-1.04**	-1.20**	-1.42**	-.75**	.14	-.60*	-1.21**	-1.02**	-.80	-.86*	-.98**
	(.72)	(.25)	(.32)	(.16)	(.22)	(.50)	(.39)	(.31)	(.17)	(1.07)	(.45)	(.16)
Wife's labor income	-.40	-.22	.15	-.61*	-.65*	—	—	-.70*	-.38*	.19	-.61	-.43*
	(1.63)	(.82)	(.39)	(.32)	(.27)			(.44)	(.26)	(1.09)	(.69)	(.21)
Transfer income	.43	-.28	-.12	-.38	-1.68*	.38	-.77*	-.44	-.29	-.55	1.69*	-.05
	(.61)	(.53)	(.40)	(.65)	(.70)	(.69)	(.46)	(.86)	(.46)	(.42)	(1.06)	(.36)
B: Mean Elasticities for the Coefficient of Variation of Components of Head's Labor Income												
Average hourly earnings	1.02	-.66	-.51	-.51*	-.45	.18	-.43	-1.54*	-.30	.11	.01	-.56**
	(1.46)	(1.53)	(.73)	(.21)	(.43)	(.57)	(.45)	(.76)	(.29)	(2.03)	(.33)	(.20)
Annual hours	-.79*	-.52*	-.66*	-.66**	-.08	.07	-.45	-.71**	-.40**	-.57	-.83**	-.33**
	(.44)	(.27)	(.26)	(.13)	(.16)	(.38)	(.37)	(.17)	(.10)	(.63)	(.27)	(.07)
C: Mean Elasticities for the Coefficient of Variation of Components of Wife's Labor Income												
Average hourly earnings	.35	.03	-3.04*	.40	-.79	—	—	-1.76*	-.32	-.87	-.61	-.66*
	(1.10)	(2.04)	(1.12)	(.54)	(.59)			(.88)	(.48)	(1.47)	(.75)	(.39)
Annual hours	.10	.01	.39	-.69**	-.17	—	—	-.44	-.17	.23	-.76	-.20*
	(1.53)	(.81)	(.46)	(.18)	(.21)			(.60)	(.14)	(1.17)	(.65)	(.12)

Note: Standard errors in parentheses. Constant included in all regressions but not reported. See Table 1 for explanation of column headings.

*Significant at .1% level.
**Significant at .01% level.

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The channel by which this narrowing occurs is also clear. The dispersion in labor market income of household heads narrows significantly for all groups except the elderly and black women heading households. Wife's labor market income shows few effects--only among wives in upper-income groups and among wives of white men and the middle-aged is there significant narrowing. (These results are consistent with the results above which indicated that wives in low-income households and female household heads benefit less from the cycle. The worst off among these groups seem unable to take advantage of economic growth to "catch up" and narrow the income distribution within the group.)

If we look at Parts B and C in Table 5 it is clear that the narrowing in the coefficient of variation that occurs in labor market income seems to be occurring almost exclusively through changes in annual hours. The distribution of hours narrows significantly among those groups which show changes in labor income dispersion, but the distribution of wages does not change.[25] While the relative narrowing between groups occurred because of greater cyclicality in both wages and hours among low-income groups, the narrowing dispersion of income within groups appears predominantly the result of extended work hours of unemployed or underemployed household heads.

Elasticities of the coefficient of variation among components of transfer income are not reported here, largely because virtually no significant effects appear and few patterns are visible.

Thus, among most groups I find evidence of a narrowing distribution in labor market income as the economy grows, owing to a narrowing in the distribution of annual hours worked. The groups for whom this effect

is weakest are female household heads and elderly households. Distributional patterns both between and within population groups change with macroeconomic upturns.

CONCLUSIONS

This study has decomposed total income among various population groups into its several components and then studied the manner in which these components change with economic growth. Among the major conclusions are the following:

1. There are large differences in the components of income received by different income, race, sex, and age groups. Aggregate income statistics hide very significant differences in earning and income patterns among population groups.
2. A great deal of dynamic income change occurs within certain population groups, exclusive of macroeconomic effects. Income groups show regression toward the mean, an effect stronger among low-income than among higher income groups. Elderly households lose income while young households gain. The bulk of this secular income change across years occurs due to changes in the labor market income of household heads: the unemployed gain jobs, and the underemployed work longer hours.
3. This study finds firm evidence that the income distribution narrows in times of economic growth. This occurs despite the fact that low-income groups have a very small share of labor market income as compared to higher income quartiles. The narrowing occurs because among low-income groups this small

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share of labor market income grows rapidly when GNP increases, overcoming the differential in shares.

4. The rise in household heads' labor market incomes during economic upswings is consistently stronger than the corresponding rise in total income for almost all groups. Underlying this, we find that both wages and hours of household heads show positive cyclical effects, a result that is probably due to the inclusive definition of labor income (overtime and second jobs included) which is used to define wages.

5. Wifes' labor market income is found to be far less responsive to macroeconomic growth than their husbands'. While wives' wages do rise in response to economic upturns, their hours show little change, except among a few groups.

6. Female household heads show less cyclicality than any other group across a range of income components. Black women in particular show only small responses to economic growth. In fact, a major conclusion of this study is that women's labor market earnings in general improve far less with general economic growth than do men's. Their initial elasticity response is lower and falls off rapidly as economic growth continues.

7. Transfer income is countercyclical for most middle-income groups. Lower-income groups show little change in their transfers as the economy expands. However, that effect varies greatly by the type of transfer. Unemployment Insurance and Workers' Compensation, and AFDC decline with economic improvement. Social security appears to rise, perhaps because of the timing of program expansions not necessarily related to economic growth. For low-income

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groups, cyclicality in public transfers is more important, while for higher-income groups, cyclicality in private transfers (child support or other retirement income) is more important.

8. Income dispersion (as measured by the coefficient of variation) narrows within almost all groups, primarily because the dispersion of annual hours worked by household heads narrows. This implies that the worst off among these groups catch up relative to the rest of the population by taking advantage of greater employment opportunities. Female and elderly household heads and wives show less evidence of this within-group income narrowing than do other population groups.

While this research uncovers a number of interesting patterns, it also raises a host of additional questions. Further exploration is needed of the causality behind many of the effects seen here. In particular, it would be interesting to focus more on the consistent non-responsiveness of women's labor market income (both of female household head and wives) to the cycle. Also, a closer investigation needs to be done of the comparative wage and hours cyclicality found here. In addition, further analysis of some of the cyclical effects among the components of transfer income would be of interest, including research on why similar transfers appear to respond differently over the cycle for different population groups.

Finally, this study says nothing about the effects of changes in long-term secular growth rates within the macroeconomy. Over the time period of this study, no secular growth is apparent. However, the response of different groups in the population to short-term economic

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growth may be expected to have some correlation with their response to long-term growth. If so, it is clear that a higher long-term growth rate for the U.S. economy would narrow the income distribution and help a significant number of currently low-income households. (An effect often referred to as "trickling down.") However, it is also true that these benefits would not be equally spread among members of the low-income population. Especially among female household heads--a group that has received a great deal of attention because of their high poverty rates--economic growth alone falls far short of being either a panacea or a solution.

Notes

[1]For a review of this literature, see Blank and Blinder (1985).

[2]Among others, see Beach (1977), Thornton, Agnello, and Link (1978), or Hirsch (1980).

[3]Most recently, see Gramlich and Laren (1984) or Blank and Blinder (1985).

[4]See, for example, Mincer (1962), Raisain (1979, 1983), or Lundberg (1985).

[5]Of course, I could further decompose Hours into Hours per Week and Weeks per Year. This is not done because the data available on these two variables in my data set (the PSID) are more suspect than the data on AHE and Hours. For many individuals, it is missing.

[6]The largest welfare program in the "other" category is Supplementary Security Income (SSI). SSI is created at the federal level in the middle of the time period covered by my data. Prior to its emergence, many households received transfers from a variety of state-run programs, which cannot be separately identified. It was easiest to leave all of this in the "other transfers category. Compared to Social Security and AFDC, SSI is a less significant program.

[7]Of course, one could separate these other labor market earnings from this category. But there is a limit to the number of variables easily examined in one paper. I chose to aggregate these components, finding that the difference between head's and spouse's earnings and transfers is of the most interest.

[8]For a full explanation of the difference, see User Guide to the PSID (1984).

[9]For instance, this definition is used by Bane and Ellwood (1983) in their study of the dynamics of poverty status using the PSID.

[10]Placement of households within each income quartile is done solely on the basis of their relative income level and does not consider need.

[11]This data set is somewhat different from many others. Typically, one either has extensive cross-sectional data for one year only (such as a CPS survey) or one has aggregate mean data from different random samples taken each year (such as annual wages or unemployment rates.) In contrast, my data set allows one to estimate changes between years among the same households. But successive changes come from different cross sections, weighted to appear as identical random samples of the population.

[12]This study makes no attempt to separately identify permanent and transitory income effects. For instance, households could potentially be grouped by income according to their permanent, rather their current, income. This is not done for two reasons. First, I am interested in knowing the effect of cyclical changes on the apparent income distribution. Among those whose income grows when the macroeconomy improves will be some who are experiencing long-term income growth and others who are simply recovering from a short-term income fluctuation. It is left to future research to separately estimate the extent of these two effects. Second, and more practically, there are serious empirical problems in satisfactorily estimating permanent income levels for households that change headship and composition frequently. The groups in which I am most interested--low-income or female-headed households--are precisely those for whom this problem is most acute.

[13]One way of interpreting these numbers is that the labor supply functions governing behavior of workers at different income levels are different. Low-income household heads supply more hours of work at their mean wage rates than do higher-income households.

[14]Of course, underreporting of transfer income may affect these numbers.

[15]According to U.S. government figures, median family income (in 1981 dollars) in 1969 was $23,482. In 1981 it was almost unchanged at $23,282.

[16]For instance, many researchers regularly attempt to enter state or even county unemployment rates into microdata labor force participation estimates. Although one might believe that unemployment rates should affect household labor force decisions, the coefficients on these aggregate unemployment rates rarely differ from zero.

[17]Of course, GNP is not the only possible measure of cyclicality. Some studies have used changes in unemployment rates. I choose to use GNP for two reasons. First, most of the "trickling down" theories explicitly refer to macroeconomic growth as the primary channel by which the income distribution is affected. GNP growth is the most frequently used measure of this. Second, the unemployment rate over these 12 years experienced a significant amount of change due to shifting demographic patterns, producing a steady increase in the average underlying rate of unemployment between 1969 and 1981. This means that unemployment changes imbed both demographic and cyclical effects, making them a less attractive measure of cyclical change.

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[18]Rather than using the percentage change of the means, I realize that I could calculate the mean of the percentage changes. This would create difficulties, however, as nonrecipients in year t would have zeros in the denominator.

[19]Rather than use mean income components for each population group as my dependent variables, I could regress individual household observations against aggregate GNP changes. Rather than 12 observations, I would then have many thousands. This alternative is costly to implement and both estimating techniques should produce identical coefficients, since OLS fits a line through the means. The standard errors will vary, and it is impossible to say a priori which set of standard errors will be lower. Under reasonable assumptions one could expect that the standard errors on my estimates will be larger, implying that my significance levels may be understated relative to a fully efficient estimator.

[20]For instance, Altonji and Ashenfelter (1980) find that wages appear to follow a random walk and are unrelated to the macroeconomy. Geary and Kennan (1982) reach similar conclusions.

[21]The wage measure used here is the ratio of all labor market income over annual hours of work. Explicit wage rates are not available for the entire sample during the 12 years which I am analyzing.

[22]Recall that the level elasticity is the expected level change due to a 1% increase in GNP calculated over the entire population. Since many wives do not work, these expected level changes are quite small. This also means that the base of the percentage change calculation is small, so small absolute changes in levels can produce large percentage changes.

[23]The classical work on the cyclicality of wife's income is Mincer (1962), who finds almost no cyclical effects. On the other hand, quite a few cross-sectional studies have found strong negative relationships between wife's participation and husband's earnings. Most recently, see Ransom (1982) and Lundberg (1985). My results, showing large added-worker effects only among poor wives, is consistent with this other research.

[24]As Table 2 indicated, there are consistent changes in the mean of some of these income components for certain populations over a two-year period. (For instance, among the young, income grows, on average.) In general, the coefficient of variation measures the dispersion of the variable in each year, without being affected by these mean changes.

[25]Realize that one cannot just aggregate the variance effects on wages and hours to calculate the variance of total labor income, since there are covariance effects involved in the multiplicative relationship.

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