Generalized Entropy Measures of
Long-Run Inequality and Stability Among
Male Headed Households

by
Sourushe Zandvakili*

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* University of Cincinnati, Cincinnati, OH 45221 and the Jerome Levy Economics Institute.

ABSTRACT

Short and long-run inequalities and income stability among households with male heads are measured and analyzed using the Panel Study of Income Dynamics for 1969-81. The results suggest short-run inequalities are increasing over the period with fluctuations. These fluctuations contain transitory components which can be eliminated by smoothing of the data. Long-run measures are less subject to fluctuations and, therefore, provide a better measure of inequality. They show a decrease in inequality in the early periods but increases after the mid-1970's. Several aggregator functions are used to compute "permanent income" variables for the long-run measures of inequality and stability. The measures are decomposed to reflect differences in age, education, and race. They are decomposed also into groups which are free of such group characteristics. Education has the most important influence on inequality. Stability profiles indicate, furthermore, most of the reduction in inequality in the early periods among households with male heads has been within particular groups. Reductions across groups are minimal.

I. INTRODUCTION

There are many studies suggesting an increase in the inequality in earnings among U.S. males over the past 20 years. For examples, see Dooley and Gottschalk (1984), Henle and Ryscavage (1980), Plotnick (1982), Mincer (1974), Freeman (1979), and Welch (1979). There is a range of hypotheses offered to explain this increase. No agreement has emerged, however, as to the nature and cause of this phenomenon. Generalized Entropy (GE) frameworks are employed in this study with the expectation that their ability to permit decomposition provides a more appropriate framework of analysis. Inequality and mobility measures are employed and applied to the Michigan Panel Study on Income Dynamics (PSID) for the period 1969-81. GE permits investigation of the nature of these changes in inequality components which are group specific (age, education, and race) as well as components which are free of such group characteristics.

A framework introduced in Maasoumi (1986) and Maasoumi-Zandvakili (1990) is used to provide an appropriate income aggregation procedure so that measurement of long-run inequality and income stability is now possible. Most studies look at a "snap-shot" of the short-run distributions of income and make judgments regarding the changes in inequality. More importantly, this "snap-shot" approach allows no analysis of the transitory components in short-run inequalities. A stability measure provides, an accurate picture of the degree of equalization taking place over time among and across households. Mobility increases the degree of equalization among and across households. Decomposition of stability profiles into the "between-group" and "average within-group" components and a measure of group stability enhances the understanding of the nature of changes in equalization.

The framework for the measurement of short-run inequalities, long-run inequality, income stability, and their decomposition is found in section II.

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Section III summarizes the overall patterns found. Sections IV, V, VI contain discussions of life cycle implications, human capital considerations, and the factors of race and ethnicity with appropriate decompositions. Conclusions appear in section VII.

II. THE MODEL

Individual or household income is a measure of economic well-being. It is measured normally for a specific time period. Such a short-run measure is only a "snapshot" of an attribute (income) which is hard to define and which changes. Consider the two individuals with the distributions of [4, 8] and [8, 4] in two consecutive periods. The observed relative inequality in each period has not changed although the individuals have traded their positions in the distribution of income. Short-run measures would show no equalization. The long-run or multi-period inequality has declined, however, as can be seen with a simple linear aggregation of incomes over the two periods which will produce perfect equality. Aggregation techniques are subjective, of course, but the approach used in this study has the flexibility to allow an exploration of the area between the two extremes sketched above.

Income aggregation functions are used as measures of "long-run" income (utility). These functions provide weights for income at different points in time. The aggregate incomes have "distributions" which are close to the annual income distributions. The notion of closeness follows Maasoumi (1986) which is based on information theory. This approach provides an appropriate interpretation for many of the popular utility functions including CES, linear, and Cobb Douglas.

Let Y_{it} denote the income of household $i = 1, \ldots, N$ in period $t = 1, \ldots, T$. Allow $S_i = S_i(Y_{i1}, \ldots, Y_{it})$ to represent aggregate income such that:

$$S_i = [\Sigma_t \phi_t Y_{it}^{-\beta}]^{-1/\beta} \qquad\qquad \beta \neq 0, -1 \qquad\qquad (1)$$

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$$= \pi_t Y_{it}^{\phi_t} \qquad\qquad \beta = 0 \qquad\qquad (1')$$

$$= \Sigma_t \phi_t Y_{it} \qquad\qquad \beta = -1 \qquad\qquad (1'')$$

where ϕ can be regarded as income weight for each period, such that $\Sigma_t \phi_t = 1$. The constant elasticity of substitution of income over time is $\sigma = 1/(1 + \beta)$. The family of measures employed to compute inequality is the Generalized Entropy (GE). The Generalized Entropy measures of inequality satisfy the "fundamental welfare axioms" exemplified in Cowell and Kuga (1981) and Foster (1983). Maasoumi (1986) develops multi-period or attribute inequality measures using the aggregate income shares $S^* = (S_1^*, \ldots, S_N^*)$ and $S_i^* = S_i / \sum_{j=1}^N S_j$, and a GE approach as given below:

$$I_\gamma(S) = \Sigma_i \, [(NS_i^*)^{1+\gamma} - 1] \, / \, N\gamma(1+\gamma) \qquad\qquad \gamma \neq 0, -1 \qquad\qquad (2)$$

$$= \Sigma_i \, S_i^* \text{Log } (NS_i^*) \qquad\qquad \gamma = 0 \qquad\qquad (2')$$

$$= \Sigma_i \, N^{-1} \text{log } (1/NS_i^*) \qquad\qquad \gamma = -1 \qquad\qquad (2'')$$

I_o and I_{-1} are the well known Theil (1967) information indices. These measures include monotonic transformations of measures proposed by Atkinson (1970).

To measure stability over $M \leq T$ periods, the corresponding long-run inequality $I_\gamma(S)$, and a weighted average of short-run inequalities, $\Sigma_t \alpha_t I_\gamma(Y_t)$, are calculated. A measure of stability (mobility) over the M periods is derived from the following relationship:

$$R_M = I_\gamma(S)/\Sigma_t \alpha_t I_\gamma(Y_t) \qquad\qquad (3)$$

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For some S_i, the restriction $0 \leq R_M \leq 1$ holds for all convex measures $I(\cdot)$ and $\Sigma_t \alpha_t = 1$. This restriction holds for other functions following the propositions 1 and 2 in Maasoumi (1986) such that $-\gamma = (1+\beta)$. Definition (3) generalizes Shorrochs (1978). As $M \to T$, the profile generated by R_M reflects changes in the distribution of income (stability). The choice of $I_\gamma(S)$ affects, of course, the computation of R_M. Inequality measures vary in their sensitivity to transfers in the distribution of income. In order to analyze this sensitivity, as well as the role of aggregation method, we use several inequality measures and aggregation methods.

The usefulness of additive decomposition property of Generalized Entropy measures in this context is discussed in Maasoumi-Zandvakili (1990). For example Theil's second measure of inequality can be decomposed to:

$$I_{-1} = I_{-1}(S.) + \sum_{r=1}^{R} P_r I_{-1}(S^r) \tag{4}$$

where P_r is the population share of the rth group, $r = 1 \ldots, R$. Note that S^r is the rth group's share vector and $S.$ is the vector of group means. The first term on the right is the "between-group" component of the measured inequality. The second term is a weighted average of "within-group" inequalities. This measure of stability can be decomposed also into the "between-group" and "average within-group" component such that $R_M = R_b + R_w$. Group specific stability profile can be computed as well from the following expression:

$$R^W = I_\gamma(S^W)/\Sigma_t \alpha_{tr} I_\gamma(Y_t^W) \tag{5}$$

where the income share of the ith household in the rth group at time t is Y_{tri} with the relative weights given as α_{tr}. Similarly $0 \leq R^W \leq 1$.

III. THE OVERALL PATTERNS

One of the basic structural changes in the U.S. labor market has been the rise in the labor force participation ratio of women in general and married women in particular. Consequently, inequality among households headed by men has to be studied in the context of the family. The data are derived from the 1776 families whose head is male in Panel Study on Income Dynamics (PSID) from 1969-81. Total Family Income includes head of household's earned income such as wages and salaries, business income, interest, and dividends; transfer payments such as unemployment workers compensation, aid to the families with dependent children, social security, and retirement benefits; other income such as child support and spouse's income. Real Total Family Income (TFI) is obtained using the current price index. The real Per Capita Family Incomes (PCFI) is the base for this study. Since households pool incomes, PCFI is a better indicator of the economic well-being of the family than Total Family Income, as established in Kakwani (1984) and Rosen (1984). Results based on TFI are available from the author, and they are used in making some comparisons in this paper. In order to compute aggregate income, three types of weights for annual incomes are used--Equal Income Weights (EIW), Principal Component Weights (PCW), and Mean of Income Weights (MIW). See Maasoumi and Zandvakili (1990) for details. The results are invariant generally with respect to the weights used. The results based on MIW are presented.

The overall results based on PCFI are presented in table 1, which reports short-run inequalities $I_\gamma(Y_t)$, long-run inequality $I_\gamma(S)$ and income stability R_M. As we move from 1969 to 1981, the number of periods over which $I_\gamma(S)$ and R_M are calculated is increasing from 1 to 13. The long-run measures in later years, of course, aggregate more observations than the earlier years. Four measures of short-run inequality are given in the top section of Table 1, denoted by $-\gamma = V = (2.0, 1.0, 0.5, 0.0)$. The choice of γ reflects a measure

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of the degree of sensitivity to transfers at each income level. As γ increases more weight is attached to the transfers at the lower end of the distribution and less to those at the top. With $\gamma = -2$ the short-run inequalities are most pronounced and become smaller as $\gamma \to 0$. An increasing trend in short-run inequality is observed over the 13 years. These results may be distorted, however, because of the existence of transitory components in income. Any judgment regarding the status of short-run inequality among households headed by males must be tentative. Most of the existing literature looks at these annual results and offers hypotheses to explain the rise in inequality among males. To explain the rising trend of inequality among males (in our case households headed by a male), however, measures of long-run inequality must be employed.

Long-run measures of inequality among households headed by males are presented in the mid-section of table 1. The results are uniformly smaller than the short-run observations with the exception of 1970 when $\gamma = -2$. This is the result of the smoothing of transitory components through aggregation and is invariant with respect to the type of aggregation function used. Long-run inequality among households headed by males decreases up to the mid-1970's and increases for the remainder of the period. A question that remains is why the initial fall in the long-run inequality was not sustained.

The entrance of married women into the labor force in the late 1960's and early 1970's may have caused the earnings of these households to approach the mean. Most married women entered the secondary labor market with low wages. The recession of 1974-75 also may have had a differential impact among families. The impact of business fluctuations is not uniform across all households. Those with low skills and seniority tend to get affected more severely. There is some evidence, however, suggesting the rate of male non and partial participation in the labor force increases across all ages and

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affects the distribution of income as suggested by Parson (1980). Changes in the rate of participation could be attributed also to factors such as age, education, race, and institutional changes in the welfare system.

Income stability measures appear at the bottom of tables 1. Recall the values of R_M range between zero and one. As $R_M \rightarrow 0$, the distribution of income moves toward equality. For $\gamma < -2$, some equalization takes place until the mid-1970's; however, there seems to be some permanent level of inequality below which it is difficult to move. For $\gamma = -2$, equalization continues in-to 1980's but it is sensitive to the definition of income (TFI vs PCFI). Comparing figures 1 and 2, it is evident that more equalization occurs using TFI as the measure of economic well being. Decomposition is necessary to better understand these patterns.

IV. THE LIFE CYCLE IMPLICATIONS

The measures of short and long-run inequality and income stability are decomposed over five groups, defined by the age of the male head of household in 1969. The "between-group," and "average within-group" components of the overall inequality, as well as group inequality and stability measures are determined. Due to our decomposition the number of observations in each group is not large. However, this should not cause concern since I am using actual household data and not grouped aggregated data. This approach uses far more observations (information) than the grouping approach: i.e. Cowell and Mehta (1982). The number of observations in my smallest group is far larger than the number of groups in most studies. The grouping approach is generally sensitive to the number of groups used, and the number of observations in each group. This suggests the cut-offs for each group play a very important role. The choice for cut-offs is normative and it influences the measured inequality. Furthermore, the grouping approach assumes the inequality to be zero within each group. Kakwani (1976) demonstrated that this leads to

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substantial underestimation of measured inequality.

The purpose of the decomposition and the grouping is to investigate inequality and changes in the distribution of income among and across age groups. The measures for each group are continuous for the thirteen years of the study. This permits drawing inferences as to life-cycle patterns. Given that the individuals in each age group are roughly at the same points in their life-cycle, inequality between groups reflects the influence of earning patterns over the life-cycle. Inferences are drawn, therefore, as to the influence of aspects of the life-cycle pattern such as returns on accumulated wealth and human capital of the older, more experienced groups. If inequality among groups is not the result of life-cycle patterns, there would have to be group (age) specific factors at work. The relative influence of inequality within age groups and between age groups on the overall level of inequality can be determined. Is the overall level of inequality the result of inequality among individuals in the same age group or in different age groups?

Decompositions by age of annual, short-run inequalities is provided in Table 2. For considerations of space, results are shown for only every other year (odd) in the tables in the rest of the paper. The following inferences can be drawn:

    (i)   The "average within-group" inequality is the dominant component of the overall inequality. It has a rising trend. This trend is observed regardless of the inequality measure used.

  (ii)   The "between-group" component also is rising in each of the 13 years. This rise is greatest with $\gamma < -2$.

(iii)   Short-run inequalities for each of the five age groups increased. The youngest age group generally has the least short-run inequality, and but increases generally as the age of the group increases. This

reflects different returns on deferred investment in human capital. It would appear that patterns in life-cycles are less important in influencing the overall level of inequality than the factors shaping the inequality among individuals within the groups. Age, per se is not a strong explanation of inequality.

Decomposition of long-run inequality by age is provided in Table 3. The following observations can be made:

(i)   Since the transitory components have been smoothed out, a rise in the "between group" inequality is observed.This is seen easily by comparing the short and long-run "between-group" components for 1981 in Tables 2 and 3. The "greater" the smoothing (aggregation), the larger the "between-group" inequality measure and its relative influence on the overall measure.

(ii) Inequality among households headed by males decreases as the early years of the period are aggregated until the mid-1970's. Further aggregation produces increases for the remainder of the periods. The measured long-run inequality for each of the age groups gets smaller as $\gamma \to 0$.

(iii) Inequality is smallest for the youngest age group and largest for two oldest age groups. The suggested reason was provided as we discussed the decompositions of short-run inequality.

(iv) The stability profiles in Table 4 indicate most equalization has occurred within age groups with minimal equalization among age groups.

The rise in long-run inequality is often attributed to a decline in male participation in the labor market. A rise in real wages, however, may have caused the age/earning profiles to shift upward with an income effect greater than the substitution effect, resulting in fewer work hours for some and early

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retirement for others. The growth in the coverage and benefits from Social Security and private pension plans may have contributed to a decline in the labor force participation rate by those in the oldest age group. Discussions in Blinder, Gorden, and Wise (1980), and Burtless and Moffitt (1984) are helpful on this point.

Smaller participation in the labor force by the youngest age group (18-29) is a life-cycle phenomenon. Greater investment in human capital by this group reduces labor force participation and increases the expectation of higher future earnings. This may be viewed as an optimal time to take on the investment so as to minimize the opportunity cost of time and maximize the duration in which higher returns are received. When the individuals who do invest in human capital enter the labor market, their increased earnings will cause overall and intra-group inequality to rise for their lifetime.

The observed dispersion in household earnings is believed by most researchers to arise from age differences among primary earners in the household. Our findings suggest strongly, however, that the degree of income inequality over the life cycle among households will be less than those indicated by cross-section data for a particular year. Thus, "within-group" inequality is the dominant factor.

V. HUMAN CAPITAL IMPLICATIONS

It is an accepted view that individuals invest in human capital anticipating higher future earnings. The level of education needs to be considered, therefore, in investigating inequality among households. The data base is decomposed into four education groups. Again, the overall inequality is divided into intra and inter-group components in both short and long-run measures. The highest level of education attained by the men who were heads of households in 1975 is the basis for the decomposition. The four educational groups are: (1) up to 11th grade, (2) a high school diploma or a

high school diploma plus non-academic training; (3) college with no degree or college with a BA but no advanced degree; and (4) college with an advanced or professional degree.

As was the case with the age decomposition, overall short-run inequalities have increased generally but with some variations over each of the 13 years. The decompositions of the overall short-run inequalities based on education are provided in Table 5. The following conclusions can be drawn:

    (i)   The "between-group" component contributes a larger proportion to the overall inequality than was found in the age decomposition. Also it has a rising trend. The "within-group" component, however, constitutes the larger proportion of the overall inequality. Note that the "between-group" component has increased from 15 percent in 1969 to 23 percent in 1981 of the total inequality when $\gamma = -.5$. This is a sizable rise although the comparable increase in the age decomposition was 1% in 1969 to 12% in 1981.

    (ii)   The level of short-run inequality among families whose head had the lowest level of education is significantly higher than for other groups and decreases with the level of education. This results from the sensitivity of the measures to many exceptionally low income levels associated with some low education levels.

This evidence suggests some of the existing inequality among households headed by men is the result of the differences in the level of education. A look at the household earnings in the long-run (table 6), where transitory variations are reduced, is useful in order to determine whether this result holds. The following general observations are made:

    (i)   The proportion of the overall inequality attributable to "between-group" inequality increases from short-run inequality to long-run inequality. Also it has a rising trend over the 13 years.

(ii) The overall inequality decreases through the mid-1970's because of aggregation. Further aggregation produces increases for the rest of the period. It is highest among those with the least amount of education.

The major source of inequality in the long-run is within educational groups, repeating the short-run results. This pattern is observed regardless of the aggregation function and weights. This suggests other factors such as choice of occupation within each education category may be a major source of earnings differential. For each education group, there is a fall in long-run inequality followed by a rise in the remaining periods. The timing of this pattern, however, differs among the education groups and is somewhat sensitive to the type of aggregation function used. Variations in earnings are large for those with low education levels some with very low incomes. Those with an advanced or professional degree tend to have the lowest level of long-run inequality. This is expected since variations in the earnings for specialized degrees are rather small (in relative terms).

The decomposition of the stability profile into "between-group" and "average within-group" components (Table 7) reveals the latter is a larger proportion of overall inequality and the stability decreases as the number of years aggregated increase. The former, however, has a rising trend for aggregation in the earlier years but becomes horizontal after the mid-1970's. This suggests equalization takes place within each educational group and between-group equalization is nonexistent.

It is evident the level of human capital attained is an important determinant of the distribution of earnings. Some variations in income, however, can be related to individual differences in post-school training, restrictions of entry into occupations, etc. The results of the age decomposition are replicated for educational groupings. The within-group

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inequality is the dominant component of overall inequality, but the between-group component is increasing.

VI. RACIAL AND ETHNICITY COMPONENTS

Sizable income differential among households has been attributed to race and ethnicity of the family. Decompositions based on the race or ethnicity of the male heads of households is fruitful in examining this proposition. The total population of 1776 households headed by a male are decomposed into white and non-white. The white category includes 74 percent of the total households.

The short-run results are provided in Table 8 from which the following generalizations may be made:

(i) The "within-group" inequality is the dominating factor in the overall level of inequality and it has a rising trend. The "between-group" component is stable and its share of total inequality has fallen over the years. For example for $\gamma < -2$, the "between-group" component was around 14 percent in 1969 and 8 percent in 1981. This compares with increases from 1 percent to 12 percent and 15 percent to 23 percent over the same period in the age and education decompositions respectively.

(ii) The "within" group inequalities show a rising trend for both types of households. The short-run inequality for each year is greater among non-white than white households.

There appears to be decrease in across-group inequality in the short-run. Since the proportion of total inequality accounted for by inequality between the groups has fallen, it is tempting to conclude non-white families gained ground in some sense, compared to white families. Unfortunately, the picture is not as encouraging if one would consider the position of these families in the long-run. Table 9 provides the long-run inequality results with the

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decompositions. It follows that:

(i) The "within-group" inequality still constitutes a larger proportion of the overall inequality but exhibits a decrease until the mid-1970's and an increase for the rest of the period. The "between-group" component is stable. Since short-run overall measure increases while the long-run decreases and then increases, the share of total inequality accounted for by "between-group" inequality is larger than observed in the short-run.

(ii) There is no clear trend on the direction of the "between-group" component. Its share and direction is sensitive to the choice of the aggregation function used.

(iii) The long-run inequality among non-whites is greater than those of white households.

There appears to be a new class of non-whites in the U.S. economy: Asian and to some extent Latino immigrants who are successful on the one hand and non-middle class black and other non-whites with decreasing prospects on the other. This contributes to the rise in inequality among non-white families in the long-run. Furthermore, most of the gains for the non-whites are transitory in nature. The stability profiles and their decompositions support this observation.

Most studies that have examined this issue have made observations based on single period data. For examples see Smith and Welch (1979) and Chiswick (1974). The results of this study suggest that a reexamination of policies to combat across race income inequality is in order. The current policies based on affirmative action programs have produced no discernible results. New innovative policies need to be put into place if we are serious about correcting the current crisis. Examination of such policies is beyond the scope of this paper. As shown in table 10, the equalization has been within

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groups while the cross-equalization has been minimal. One can speculate as to the reasons for such patterns. Of course, these results hold to the extent that PSID represents the population demographics of the U.S. economy.

VII. CONCLUSION

This paper has provided a better evaluation of the status of the inequality among male-headed households. Short-run inequalities, long-run inequality, and income stability for male headed households were presented. The upward bias of short-run inequalities due to transitory components are shown to be of importance. A framework to measure long-run inequality with decompositions which is free of such transitory components is employed to further enhance an understanding of these changes. This provided us with a better picture of inequality among male headed households.

It was shown that inequality among households headed by males has increased, after a brief decrease in the early 1970's. The decomposition of overall inequality and the stability profiles based on age, education, and race provided us with valuable insights. It was shown that the "average within-group" components are the major source of inequality regardless of the choice of decomposition, but the "between-group" components are significant especially in the long-run. Thus, life-cycle, education, and race are important sources of inequality in the long-run. The decompositions show the "between group" components based on education constitute a sizable portion of the overall inequality in the long-run. The stability profiles indicate there have been short-term transitory changes in inequality among male-headed households. There seems to be a permanent level of inequality which was revealed when the profiles became flat with $\gamma < -2$. Most of the equalizations are shown to occur within the groups. Equalization across groups has been minimal.

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TABLE 1

PER CAPITA FAMILY INCOME, MEN HEAD OF HOUSEHOLD 1969-81
BASED ON MEAN OF INCOME WEIGHTS

	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
Short-Run Inequalities													
$I_2(Y)$	.793	.687	.729	.629	.629	.725	.815	.901	.981	1.373	1.211	1.401	1.520
$I_1(Y)$	.340	.354	.375	.366	.362	.391	.422	.436	.467	.488	.498	.546	.578
$I_{.5}(Y)$	.306	.320	.341	.337	.331	.354	.380	.419	.422	.427	.471	.490
$I_{.0}(Y)$	.304	.320	.344	.341	.332	.355	.383	.391	.429	.418	.417	.474	.481

	$I(S_1)$	$I(S_2)$	$I(S_3)$	$I(S_4)$	$I(S_5)$	$I(S_6)$	$I(S_7)$	$I(S_8)$	$I(S_9)$	$I(S_{10})$	$I(S_{11})$	$I(S_{12})$	$I(S_{13})$
Long-Run Inequality													
$v=2.0$	.793	.695	.665	.624	.599	.590	.588	.594	.603	.640	.656	.674	.694
$v=1.0$	.340	.327	.325	.322	.317	.317	.319	.322	.327	.334	.339	.345	.354
$v=0.5$	.306	.295	.296	.294	.291	.291	.294	.297	.302	.307	.311	.316	.324
$v=0.0$	.304	.294	.296	.295	.292	.291	.295	.298	.306	.311	.313	.319	.327

	R_1	R_2	R_3	R_4	R_5	R_6	R_7	R_8	R_9	R_{10}	R_{11}	R_{12}	R_{13}
Income Stability													
$v=2.0$	1.000	.941	.907	.885	.873	.849	.822	.798	.773	.741	.721	.694	.669
$v=1.0$	1.000	.943	.912	.895	.882	.868	.851	.837	.824	.814	.804	.790	.780
$v=0.5$	1.000	.943	.917	.900	.890	.875	.862	.852	.842	.835	.828	.817	.813
$v=0.0$	1.000	.940	.915	.898	.888	.872	.861	.853	.847	.841	.833	.824	.822

FIGURE 1 MEASURE OF INCOME STABILITY TFI 1969-81, MEN HEAD OF HOUSEHOLD BASED ON MEAN OF INCOME WEIGHTS
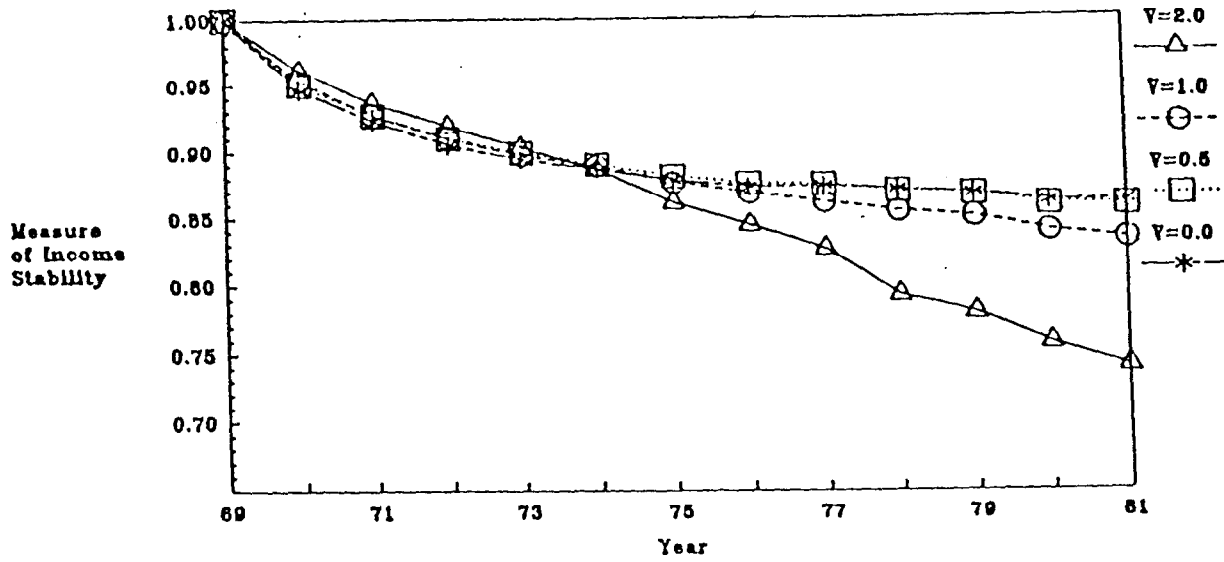

FIGURE 2 MEASURE OF INCOME STABILITY PCFI 1969-81, MEN HEAD OF HOUSEHOLD BASED ON MEAN OF INCOME WEIGHTS
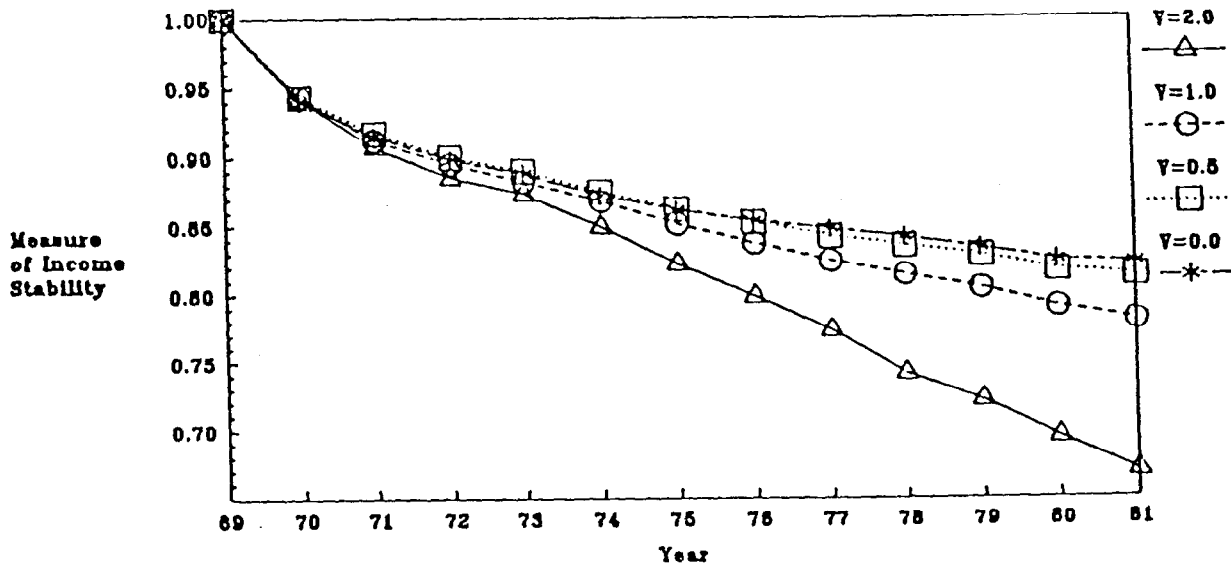
TABLE 4
1969-81 PER CAPITA FAMILY INCOME, MEN HEAD OF HOUSEHOLD (MIW)
INCOME STABILITY

	OVERALL	BETWEEN	WITHIN	18TO29	30TO39	40TO49	50TO59	60+
V= 2.0								
1969	1.000	0.005	0.995	1.000	1.000	1.000	1.000	1.000
1969-71	0.907	0.006	0.901	0.807	0.882	0.922	0.961	0.898
1969-73	0.873	0.007	0.865	0.778	0.850	0.890	0.945	0.821
1969-75	0.822	0.009	0.813	0.734	0.808	0.844	0.885	0.785
1969-77	0.773	0.011	0.761	0.695	0.763	0.802	0.828	0.733
1969-79	0.721	0.014	0.707	0.651	0.719	0.762	0.766	0.723
1969-81	0.669	0.019	0.651	0.641	0.673	0.715	0.698	0.704
V= 1.0								
1969	1.000	0.011	0.989	1.000	1.000	1.000	1.000	1.000
1969-71	0.912	0.012	0.901	0.823	0.891	0.926	0.951	0.921
1969-73	0.882	0.013	0.869	0.794	0.864	0.899	0.933	0.873
1969-75	0.851	0.016	0.835	0.760	0.833	0.873	0.898	0.847
1969-77	0.824	0.021	0.803	0.733	0.809	0.855	0.865	0.798
1969-79	0.804	0.030	0.774	0.713	0.794	0.841	0.828	0.802
1969-81	0.780	0.044	0.737	0.697	0.773	0.822	0.784	0.794
V= 0.5								
1969	1.000	0.012	0.988	1.000	1.000	1.000	1.000	1.000
1969-71	0.917	0.013	0.904	0.833	0.896	0.929	0.955	0.927
1969-73	0.890	0.014	0.877	0.808	0.875	0.904	0.939	0.887
1969-75	0.862	0.017	0.845	0.776	0.848	0.881	0.906	0.862
1969-77	0.842	0.022	0.820	0.761	0.831	0.872	0.877	0.817
1969-79	0.828	0.033	0.796	0.744	0.823	0.861	0.842	0.832
1969-81	0.813	0.050	0.763	0.746	0.803	0.848	0.804	0.830
V= 0.0								
1969	1.000	0.013	0.987	1.000	1.000	1.000	1.000	1.000
1969-71	0.915	0.013	0.902	0.836	0.896	0.925	0.953	0.921
1969-73	0.888	0.013	0.875	0.812	0.878	0.900	0.933	0.883
1969-75	0.861	0.017	0.845	0.782	0.855	0.879	0.899	0.856
1969-77	0.847	0.021	0.826	0.780	0.844	0.877	0.871	0.818
1969-79	0.833	0.031	0.802	0.765	0.838	0.863	0.833	0.836
1969-81	0.822	0.049	0.773	0.787	0.821	0.851	0.792	0.833
SS 1776				316	428	512	333	187

TABLE 5
1969-81 PER CAPITA FAMILY INCOME, MEN HEAD OF HOUSEHOLD
SHORT-RUN INEQUALITIES

	OVERALL	BETWEEN	WITHIN	0-11GR	12GR	COLLEGE	ADVDEG
V= 2.0							
1969	0.796	0.060	0.736	0.901	0.340	0.289	0.196
1971	0.730	0.080	0.650	0.638	0.494	0.379	0.278
1973	0.637	0.075	0.562	0.592	0.319	0.368	0.261
1975	0.817	0.092	0.725	0.687	0.531	0.464	0.251
1977	0.984	0.083	0.901	0.919	0.556	0.580	0.313
1979	1.212	0.088	1.124	1.104	0.758	0.722	0.402
1981	1.522	0.119	1.403	1.320	0.870	0.736	0.592
V= 1.0							
1969	0.340	0.058	0.283	0.367	0.222	0.224	0.168
1971	0.376	0.077	0.299	0.349	0.262	0.269	0.213
1973	0.363	0.072	0.290	0.351	0.239	0.261	0.195
1975	0.422	0.087	0.335	0.386	0.295	0.319	0.207
1977	0.467	0.080	0.387	0.488	0.294	0.341	0.256
1979	0.497	0.085	0.412	0.520	0.338	0.331	0.270
1981	0.578	0.113	0.464	0.579	0.381	0.378	0.334
V= 0.5							
1969	0.306	0.057	0.249	0.333	0.208	0.218	0.164
1971	0.341	0.076	0.265	0.315	0.248	0.257	0.201
1973	0.331	0.072	0.259	0.318	0.233	0.249	0.188
1975	0.380	0.086	0.293	0.344	0.272	0.303	0.204
1977	0.419	0.080	0.339	0.452	0.268	0.319	0.257
1979	0.426	0.085	0.341	0.453	0.300	0.299	0.251
1981	0.489	0.113	0.376	0.492	0.336	0.339	0.305
V= 0.0							
1969	0.305	0.057	0.247	0.335	0.210	0.226	0.166
1971	0.344	0.077	0.267	0.312	0.258	0.263	0.198
1973	0.333	0.072	0.260	0.313	0.244	0.253	0.189
1975	0.382	0.086	0.296	0.336	0.274	0.312	0.211
1977	0.429	0.081	0.348	0.486	0.268	0.328	0.276
1979	0.417	0.086	0.330	0.444	0.298	0.296	0.250
1981	0.480	0.115	0.365	0.472	0.334	0.337	0.307
SS 1770				776	492	392	110

TABLE 6
1969-81 PER CAPITA FAMILY INCOME, MEN HEAD OF HOUSEHOLD (MIW)
LONG-RUN INEQUALITY

	OVERALL	BETWEEN	WITHIN	0-11GR	12GR	COLLEGE	ADVDEG
V= 2.0							
1969	0.796	0.060	0.736	0.901	0.340	0.289	0.196
1969-71	0.667	0.072	0.595	0.655	0.350	0.279	0.198
1969-73	0.601	0.076	0.525	0.561	0.315	0.279	0.184
1969-75	0.590	0.083	0.507	0.520	0.324	0.279	0.183
1969-77	0.605	0.089	0.515	0.515	0.338	0.289	0.184
1969-79	0.657	0.095	0.562	0.553	0.375	0.308	0.198
1969-81	0.695	0.101	0.594	0.583	0.377	0.320	0.211
V= 1.0							
1969	0.340	0.058	0.283	0.367	0.222	0.224	0.168
1969-71	0.326	0.069	0.257	0.320	0.215	0.209	0.169
1969-73	0.317	0.072	0.246	0.301	0.206	0.211	0.157
1969-75	0.320	0.077	0.242	0.292	0.207	0.213	0.157
1969-77	0.328	0.082	0.246	0.294	0.209	0.219	0.163
1969-79	0.339	0.085	0.253	0.308	0.211	0.221	0.173
1969-81	0.353	0.091	0.262	0.327	0.210	0.221	0.182
V= 0.5							
1969	0.306	0.057	0.249	0.333	0.208	0.218	0.164
1969-71	0.296	0.068	0.228	0.290	0.206	0.203	0.167
1969-73	0.291	0.071	0.220	0.274	0.200	0.206	0.157
1969-75	0.294	0.076	0.217	0.267	0.198	0.209	0.157
1969-77	0.302	0.080	0.222	0.272	0.199	0.218	0.166
1969-79	0.311	0.083	0.228	0.285	0.201	0.218	0.176
1969-81	0.324	0.090	0.233	0.303	0.199	0.217	0.187
V= 0.0							
1969	0.305	0.057	0.247	0.335	0.210	0.226	0.166
1969-71	0.296	0.068	0.227	0.286	0.212	0.209	0.171
1969-73	0.292	0.071	0.221	0.269	0.207	0.212	0.160
1969-75	0.295	0.076	0.219	0.260	0.203	0.218	0.161
1969-77	0.306	0.078	0.228	0.275	0.203	0.228	0.176
1969-79	0.313	0.081	0.232	0.288	0.206	0.226	0.185
1969-81	0.327	0.090	0.237	0.303	0.203	0.227	0.199
SS 1770				776	492	392	110

TABLE 7
1969-81 PER CAPITA FAMILY INCOME, MEN HEAD OF HOUSEHOLD (MIW)
INCOME STABILITY

	OVERALL	BETWEEN	WITHIN	0-11GR	12GR	COLLEGE	ADVDEG
V= 2.0							
1969	1.000	0.075	0.925	1.000	1.000	1.000	1.000
1969-71	0.907	0.098	0.809	0.897	0.891	0.845	0.802
1969-73	0.873	0.110	0.762	0.854	0.853	0.791	0.756
1969-75	0.823	0.116	0.707	0.793	0.788	0.730	0.739
1969-77	0.773	0.114	0.658	0.719	0.744	0.681	0.711
1969-79	0.721	0.104	0.617	0.658	0.687	0.644	0.672
1969-81	0.670	0.097	0.573	0.618	0.628	0.593	0.609
V= 1.0							
1969	1.000	0.169	0.831	1.000	1.000	1.000	1.000
1969-71	0.912	0.192	0.720	0.902	0.899	0.865	0.839
1969-73	0.882	0.199	0.683	0.862	0.861	0.825	0.801
1969-75	0.851	0.205	0.646	0.817	0.812	0.784	0.790
1969-77	0.824	0.206	0.618	0.763	0.784	0.759	0.775
1969-79	0.804	0.203	0.601	0.736	0.749	0.738	0.765
1969-81	0.781	0.202	0.578	0.726	0.701	0.695	0.735
V= 0.5							
1969	1.000	0.187	0.813	1.000	1.000	1.000	1.000
1969-71	0.917	0.211	0.706	0.905	0.907	0.875	0.854
1969-73	0.891	0.218	0.673	0.867	0.873	0.840	0.818
1969-75	0.862	0.224	0.638	0.825	0.825	0.805	0.809
1969-77	0.842	0.223	0.619	0.778	0.803	0.791	0.806
1969-79	0.828	0.221	0.607	0.762	0.775	0.772	0.803
1969-81	0.813	0.227	0.586	0.762	0.733	0.730	0.790
V= 0.0							
1969	1.000	0.188	0.812	1.000	1.000	1.000	1.000
1969-71	0.915	0.212	0.703	0.900	0.910	0.877	0.860
1969-73	0.888	0.217	0.671	0.860	0.878	0.845	0.823
1969-75	0.861	0.222	0.639	0.817	0.830	0.814	0.816
1969-77	0.847	0.217	0.630	0.784	0.809	0.808	0.827
1969-79	0.833	0.216	0.618	0.770	0.782	0.786	0.824
1969-81	0.822	0.227	0.595	0.770	0.746	0.745	0.826
SS 1770				776	492	392	110

TABLE 2
1969-81 PER CAPITA FAMILY INCOME, MEN HEAD OF HOUSEHOLD
SHORT-RUN INEQUALITIES

	OVERALL	BETWEEN	WITHIN	18TO29	30TO39	40TO49	50TO59	60+
V= 2.0								
1969	0.793	0.004	0.790	0.312	0.424	0.702	2.005	0.811
1971	0.729	0.005	0.724	0.596	0.580	0.684	1.093	0.786
1973	0.636	0.011	0.626	0.330	0.418	0.757	0.963	0.633
1975	0.815	0.017	0.798	0.482	0.496	0.904	1.195	0.832
1977	0.981	0.021	0.960	0.490	0.632	1.088	1.347	0.972
1979	1.211	0.047	1.164	0.573	0.767	1.196	1.556	1.027
1981	1.520	0.084	1.436	0.636	1.022	1.475	1.592	1.072
V= 1.0								
1969	0.340	0.004	0.336	0.225	0.270	0.355	0.448	0.425
1971	0.375	0.005	0.370	0.274	0.306	0.369	0.497	0.460
1973	0.362	0.010	0.353	0.244	0.274	0.380	0.468	0.437
1975	0.422	0.014	0.407	0.292	0.317	0.417	0.537	0.550
1977	0.467	0.018	0.449	0.295	0.354	0.461	0.584	0.653
1979	0.498	0.039	0.459	0.303	0.348	0.447	0.649	0.671
1981	0.578	0.067	0.511	0.379	0.388	0.510	0.724	0.643
V= 0.5								
1969	0.306	0.004	0.302	0.214	0.250	0.314	0.383	0.378
1971	0.341	0.005	0.336	0.252	0.284	0.330	0.431	0.435
1973	0.331	0.009	0.321	0.234	0.257	0.338	0.407	0.428
1975	0.380	0.013	0.366	0.275	0.299	0.365	0.464	0.553
1977	0.419	0.017	0.402	0.283	0.329	0.401	0.507	0.692
1979	0.427	0.036	0.391	0.284	0.312	0.375	0.558	0.691
1981	0.490	0.061	0.429	0.366	0.335	0.422	0.648	0.633
V= 0.0								
1969	0.304	0.004	0.301	0.217	0.249	0.309	0.372	0.372
1971	0.344	0.005	0.339	0.254	0.291	0.324	0.424	0.457
1973	0.332	0.009	0.323	0.239	0.261	0.333	0.398	0.465
1975	0.383	0.013	0.370	0.283	0.309	0.358	0.457	0.636
1977	0.429	0.016	0.413	0.299	0.340	0.398	0.503	0.895
1979	0.417	0.034	0.384	0.294	0.312	0.357	0.550	0.834
1981	0.481	0.056	0.425	0.399	0.326	0.404	0.675	0.728
SS 1776				316	428	512	333	187

TABLE 3
1969-81 PER CAPITA FAMILY INCOME, MEN HEAD OF HOUSEHOLD   (MIW)
LONG-RUN INEQUALITY

	OVERALL	BETWEEN	WITHIN	18TO29	30TO39	40TO49	50TO59	60+
V= 2.0								
1969	0.793	0.004	0.790	0.312	0.424	0.702	2.005	0.811
1969-71	0.665	0.004	0.661	0.353	0.420	0.684	1.312	0.695
1969-73	0.599	0.005	0.594	0.315	0.390	0.646	1.121	0.586
1969-75	0.588	0.006	0.582	0.303	0.378	0.651	1.045	0.574
1969-77	0.603	0.009	0.595	0.306	0.389	0.670	1.016	0.580
1969-79	0.656	0.012	0.643	0.405	0.424	0.705	0.999	0.611
1969-81	0.694	0.019	0.674	0.386	0.453	0.750	0.965	0.628
V= 1.0								
1969	0.340	0.004	0.336	0.225	0.270	0.355	0.448	0.425
1969-71	0.325	0.004	0.321	0.209	0.250	0.333	0.451	0.408
1969-73	0.317	0.005	0.312	0.201	0.245	0.327	0.442	0.385
1969-75	0.319	0.006	0.313	0.198	0.244	0.329	0.441	0.394
1969-77	0.327	0.008	0.319	0.199	0.249	0.339	0.444	0.405
1969-79	0.339	0.012	0.326	0.200	0.254	0.345	0.450	0.433
1969-81	0.354	0.020	0.334	0.204	0.260	0.352	0.459	0.447
V= 0.5								
1969	0.306	0.004	0.302	0.214	0.250	0.314	0.383	0.378
1969-71	0.296	0.004	0.292	0.198	0.233	0.294	0.392	0.379
1969-73	0.291	0.004	0.287	0.193	0.232	0.291	0.387	0.371
1969-75	0.294	0.006	0.288	0.191	0.234	0.294	0.386	0.388
1969-77	0.302	0.008	0.294	0.195	0.239	0.304	0.390	0.411
1969-79	0.311	0.012	0.298	0.195	0.243	0.307	0.396	0.449
1969-81	0.324	0.020	0.304	0.207	0.248	0.312	0.410	0.467
V= 0.0								
1969	0.304	0.004	0.301	0.217	0.249	0.309	0.372	0.372
1969-71	0.296	0.004	0.291	0.201	0.234	0.286	0.384	0.387
1969-73	0.292	0.004	0.287	0.196	0.237	0.284	0.377	0.389
1969-75	0.295	0.006	0.289	0.195	0.241	0.287	0.376	0.418
1969-77	0.306	0.007	0.299	0.205	0.248	0.301	0.381	0.469
1969-79	0.313	0.012	0.301	0.206	0.253	0.301	0.385	0.521
1969-81	0.327	0.019	0.308	0.227	0.261	0.305	0.402	0.540
SS 1776				316	428	512	333	187

TABLE 8
1969-81 PER CAPITA FAMILY INCOME, MEN HEAD OF HOUSEHOLD
SHORT-RUN INEQUALITIES

	OVERALL	BETWEEN	WITHIN	WHITE	NWHITE
V= 2.0					
1969	0.793	0.054	0.740	0.465	0.936
1971	0.729	0.056	0.673	0.601	0.613
1973	0.636	0.044	0.592	0.444	0.686
1975	0.815	0.044	0.771	0.601	0.864
1977	0.981	0.041	0.940	0.725	1.076
1979	1.211	0.042	1.170	0.866	1.388
1981	1.520	0.052	1.468	1.041	1.722
V= 1.0					
1969	0.340	0.046	0.294	0.275	0.348
1971	0.375	0.047	0.328	0.320	0.352
1973	0.362	0.038	0.325	0.297	0.400
1975	0.422	0.038	0.384	0.362	0.444
1977	0.467	0.036	0.431	0.401	0.516
1979	0.498	0.036	0.462	0.423	0.567
1981	0.578	0.044	0.534	0.489	0.658
V= 0.5					
1969	0.306	0.042	0.264	0.254	0.319
1971	0.341	0.043	0.298	0.295	0.324
1973	0.331	0.035	0.295	0.280	0.366
1975	0.380	0.035	0.344	0.336	0.392
1977	0.419	0.034	0.386	0.370	0.461
1979	0.427	0.034	0.393	0.373	0.485
1981	0.490	0.041	0.449	0.428	0.553
V= 0.0					
1969	0.304	0.040	0.265	0.254	0.325
1971	0.344	0.041	0.303	0.299	0.329
1973	0.332	0.033	0.299	0.286	0.370
1975	0.383	0.033	0.349	0.343	0.383
1977	0.429	0.032	0.397	0.383	0.472
1979	0.417	0.032	0.385	0.367	0.479
1981	0.481	0.038	0.443	0.425	0.542
SS 1776				1301	475

TABLE 9
1969-81 PER CAPITA FAMILY INCOME, MEN HEAD OF HOUSEHOLD (MIW)
LONG-RUN INEQUALITY

	OVERALL	BETWEEN	WITHIN	WHITE	NWHITE
V= 2.0					
1969	0.793	0.054	0.740	0.465	0.936
1969-71	0.665	0.056	0.609	0.460	0.665
1969-73	0.599	0.054	0.545	0.418	0.592
1969-75	0.588	0.052	0.537	0.411	0.587
1969-77	0.603	0.051	0.553	0.423	0.608
1969-79	0.656	0.053	0.603	0.443	0.682
1969-81	0.694	0.052	0.642	0.464	0.737
V= 1.0					
1969	0.340	0.046	0.294	0.275	0.348
1969-71	0.325	0.046	0.279	0.265	0.318
1969-73	0.317	0.044	0.273	0.257	0.317
1969-75	0.319	0.042	0.277	0.260	0.325
1969-77	0.327	0.041	0.286	0.268	0.338
1969-79	0.339	0.041	0.297	0.277	0.353
1969-81	0.354	0.042	0.312	0.287	0.380
V= 0.5					
1969	0.306	0.042	0.264	0.254	0.319
1969-71	0.296	0.043	0.253	0.247	0.292
1969-73	0.291	0.041	0.250	0.242	0.294
1969-75	0.294	0.039	0.255	0.246	0.300
1969-77	0.302	0.037	0.265	0.255	0.314
1969-79	0.311	0.037	0.274	0.263	0.327
1969-81	0.324	0.038	0.286	0.273	0.349
V= 0.0					
1969	0.304	0.040	0.265	0.254	0.325
1969-71	0.296	0.040	0.256	0.249	0.294
1969-73	0.292	0.038	0.254	0.246	0.297
1969-75	0.295	0.036	0.259	0.251	0.299
1969-77	0.306	0.034	0.272	0.263	0.322
1969-79	0.313	0.034	0.279	0.269	0.334
1969-81	0.327	0.035	0.292	0.281	0.352
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TABLE 10
1969-81 PER CAPITA FAMILY INCOME, MEN HEAD OF HOUSEHOLD (MIW)
INCOME STABILITY

	OVERALL	BETWEEN	WITHIN	WHITE	NWHITE
V= 2.0					
1969	1.000	0.068	0.932	1.000	1.000
1969-71	0.907	0.076	0.831	0.885	0.901
1969-73	0.873	0.078	0.794	0.848	0.860
1969-75	0.822	0.072	0.750	0.794	0.803
1969-77	0.773	0.065	0.707	0.743	0.743
1969-79	0.721	0.058	0.663	0.699	0.670
1969-81	0.669	0.050	0.619	0.642	0.638
V= 1.0					
1969	1.000	0.134	0.866	1.000	1.000
1969-71	0.912	0.129	0.783	0.897	0.901
1969-73	0.882	0.123	0.759	0.862	0.871
1969-75	0.851	0.112	0.739	0.826	0.841
1969-77	0.824	0.103	0.721	0.798	0.808
1969-79	0.804	0.098	0.706	0.779	0.777
1969-81	0.780	0.092	0.689	0.748	0.773
V= 0.5					
1969	1.000	0.138	0.862	1.000	1.000
1969-71	0.917	0.132	0.785	0.902	0.907
1969-73	0.890	0.125	0.766	0.872	0.883
1969-75	0.862	0.114	0.748	0.841	0.856
1969-77	0.842	0.104	0.738	0.821	0.833
1969-79	0.828	0.099	0.729	0.807	0.812
1969-81	0.813	0.096	0.718	0.785	0.815
V= 0.0					
1969	1.000	0.130	0.870	1.000	1.000
1969-71	0.915	0.123	0.792	0.902	0.905
1969-73	0.888	0.115	0.773	0.872	0.884
1060-75	0.861	0.105	0.756	0.844	0.856
1969-77	0.847	0.095	0.752	0.830	0.844
1969-79	0.833	0.090	0.744	0.816	0.827
1969-81	0.822	0.089	0.733	0.799	0.828

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