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ABSTRACT

It is not clear whether income inequality has increased or remained stationary during the post-World War II period. The relationship between the business cycle and inequality is also open to question. This note reviews the recent literature on the secular trend and cyclical behavior of income inequality and discusses several problems related to the measurement and interpretation of the data.

INCOME INEQUALITY: PROBLEMS OF MEASUREMENT AND INTERPRETATION

This note reviews the recent literature on the secular trend and cyclical behavior of income inequality in the post-World War II period, a literature that has confused rather than clarified the record. Several studies have concluded that the secular trend of inequality has been increasing (Brittain, 1972; Gastwirth, 1972; Henle, 1972; Schultz, 1972) while others have indicated that it is stationary (Budd, 1970; Reynolds and Smolensky, 1975; Thurow, 1970). There has also been no agreement as to the course of income inequality over the cycle. The conventional wisdom that inequality increases during recessions and declines during periods of prosperity has been both confirmed (Metcalf, 1972; Mirer, 1973b; Schultz, 1969; Thurow, 1970) and challenged (Mierer, 1973a; Tuckman and Brosch, 1975). The confusion stems from inconsistencies among the studies in data, computational procedures, time period of study, and conjectural interpretations about the empirical results. By and large, economic theory, statistical theory, or explicit ideology have not contributed to the muddle. We present and analyze the secular trend in Section I and the cyclical pattern in Section II.

I. Secular Trends and Measurement Problems

Any analysis of the degree of inequality in the size distribution of income is sensitive to the choice of demographic unit of analysis, income concept, and method of computation. Any evaluation of trend is also sensitive to the choice of time period. Table 1 presents four time series on inequality; the Gini coefficient is the summary measure used in each series. Columns 1 and 2 are based on Internal Revenue Service (IRS) data (U.S. Department of the Treasury, 1975) and measure inequality in adjusted gross incomes for all tax returns filed. Columns 3 and 4 are based on Current Population Survey (CPS) data (U.S. Bureau of the Census, 1975) and measure inequality in Census money income for families and unrelated individuals. Adjusted gross income excludes transfer income, which is not taxable, but includes realized capital gains and losses; Census money income includes transfers but excludes capital gains. In addition, there is not a one-to-one correspondence between income tax filing units and the Census Bureau's definition of families and unrelated individuals. Because of the manner in which the data are published, IRS Gini coefficients are computed using actual class means for all income intervals while CPS Gini coefficients use class midpoints and a Pareto-estimate for the open-ended interval. (See Gastwirth for a complete discussion of the measurement problem posed by this reporting difference.)

TABLE 1: COMPARISON OF TIME SERIES ON
INEQUALITY IN THE POST-WORLD WAR II PERIOD

	(1) IRS Gini Coefficient (Gastwirth)	(2) IRS Gini Coefficient	(3) CPS Gini Coefficient (Budd)	(4) CPS Gini Coefficient
1947		.4177	.430	.4150
48		.4283	.424	.4072
49		.4260	.428	.4145
50		.4321	.431	.4145
51		.4284	.416	.4017
52		.4261	.416	.4153
53		.4248	n.a.	.4089
54		.4309	.429	.4193
55	.4372	.4335	.420	.4145
56	.4361	.4325	.415	.4067
57	.4366	.4327	.418	.4031
58	.4418	.4383	.416	.4051
59	.4486	.4457	.422	.4091
60	.4450	.4416	.423	.4152
61	.4515	.4462	.432	.4241
62	.4503	.4469	.421	.4129
63	.4534	.4496	.418	.4103
64	.4574	.4530	.419	.4106
65	.4630	.4583	.417	.4082
66	.4670	.4626	.413	.4073
67	.4705	.4652	.416	.4044
68	.4748	.4733	.406	.3988
69	.4732	.4669		.4046
70		.4525		.4094
71		.4542		.4127
72				.4173
73				.4163
Mean	.4538	.4427	.420	.4106
(Std. Dev.)	(.0134)	(.0152)	(.0067)	(.0058)

Notes:

- Columns 1 and 2: Internal Revenue Service Data (IRS)
Adjusted Gross Income (excludes transfers, includes capital gains)
All filing tax returns
Actual class means for all intervals
Column 1 is data presented by Gastwirth (p. 312).
Column 2 is computed by the authors.
- Columns 3 and 4: Current Population Survey Data (CPS)
Census Money Income (includes transfers, excludes capital gains)
Families and unrelated individuals
Class midpoints and a Pareto estimate for the open-ended interval
Column 3 is data presented by Budd (p. 255).
Column 4 is computed by the authors.

Column 1 reproduces the data presented by Gastwirth (p. 312) while column 2 was computed by the authors for the entire post-war period for which data is available. These two series are highly correlated for the 1955-1969 period, the years in which the series overlap: the simple correlation coefficient is .996. Column 3 reproduces the data presented by Budd (p. 255) while column 4 was computed by the authors from the same underlying data series. For the 21 years, 1947-1952 and 1954-1968, where the two CPS series overlap, the simple correlation coefficient is only .797. This emphasizes the sensitivity of inequality measures to estimation procedures. Budd did not compute Gini coefficients using the standard procedure and "since they have been computed from smooth curves rather than linear segments, they exceed somewhat values computed by others" (Budd, p. 252).

Table 2 displays several simple regressions that reveal the conflicting secular trends that can be calculated for the period, when different end points or different income concepts are used. Each regression takes the form of

$$\text{Gini} = \alpha_1 + \alpha_2 \text{ Time.}$$

Lines 1 and 2 show that for the 1955-1969 period the time trend for the IRS data (Table 1, column 1) was positive and highly significant, while for nearly the same period (1955-1968), the trend in the CPS data (Table 1, column 3) was negative although significant at only about the 15 percent level. Line 3 shows that the trend for the IRS data for the longer period (Table 1, column 2) was positive and significant, but smaller than the trend for the shorter period. However, the trend in the CPS data (Table 1, column 4) for the longer period is not significantly different from zero. The CPS Gini coefficient reached a maximum in 1961 and a

TABLE 2: THE TREND OF INEQUALITY IN THE POST-WORLD
WAR II PERIOD

Dependent Variable	Constant	Time Trend (t-statistic)	R ²
1. IRS DATA, 1955-69 (Gastwirth)	.4302	.00294 (18.6)	.964
2. CPS DATA, 1955-68 (Budd)	.4224	-.00055 (1.50)	.158
3. IRS DATA, 1947-71 (Computed by the authors)	.4179	.00191 (11.6)	.853
4. CPS DATA, 1947-73 (Computed by the authors)	.4115	-.00006 (0.44)	.008
5. Male, full-year wage & salary workers, 1958-69 (Henle)	.2550	.00192 (4.65)	.684
6. Earnings of the Social Security population, 1951-69 (Brittain)	.4630	.00121 (4.40)	.533

minimum in 1968. Analysis of the 1947-1960 or the 1947-1973 period (Table 1, column 4) reveals no trend, while the 1947-1961 period shows an increase and the 1947-1968 period shows a decrease in inequality.

The differences in income concept and reporting unit that distinguish the IRS and CPS series suggest several explanatory hypotheses for their opposite secular trends. It has been suggested, for example, that the distribution of market earnings has shown a trend toward increased inequality because of a younger and increasingly female labor force (Kuznets, 1972, 1974; Blinder, 1975). Thurow (forthcoming) hypothesizes that government transfers and the increase in the number of families with more than one earner have countered the trend in earnings of individuals, resulting in a constant (or slightly declining) trend in inequality among households. Lines 5 and 6 of Table 2 show that two of the available series on earnings inequality among individuals (Henle, Brittain) do show a trend toward greater inequality. Since the IRS distribution is a pretax, pretransfer distribution or income among filers, while the CPS is a pretax, posttransfer distribution for households, it may be that the difference between the IRS results and those from the individual earnings series on the one and the CPS series on the other is due to the inclusion of transfers and the definition of reporting unit in the latter.

While the qualitative effects of these differences are clear, strong quantitative judgments have been made (Rivlin) but not validated.

One might well ask why they [income transfers] have not had a visible equalizing effect on the distribution of family income.

The answer appears to be that the preponderance of federal transfers has gone to retired persons and a small part to women heading families; that the recipients, especially old people, are better off, both absolutely and relatively than they used to be; but that the equalizing effect of all this on the income distribution is offset by a combination of two

other factors. One is early retirement. . . . The other is the increased tendency of adults at all ages to head their own households. (1975, p.5.)

In a recent study, Danziger and Plotnick (1975) used microeconomic data from the CPS (available only since 1965) to account for the distributional impact of changes in demographic composition and of increases in cash transfers between 1965 and 1972. They found that during this period the pretransfer and posttransfer distributions became more unequal for the entire population and for most of the demographic subgroups. The government cash transfer system dramatically reduces inequality for certain subgroups, especially the aged, but has only a modest effect on the aggregate degree of inequality. However, they found little difference in the impact of the transfer system between 1965 and 1972, despite the rapid rise in transfers. This coincides with the findings of Reynolds and Smolensky (1974 and 1975) that the fisc is not significantly more important in reducing inequality now than was the case in 1950.

Danziger and Plotnick also found that about one-half of the increase in the aggregate index of inequality cannot be accounted for by demographic change. Thus we are left with several series on inequality showing conflicting secular trends that have not been satisfactorily explained.

II. Cyclical Trends and Interpretation Problems

Empirical work on the cyclical pattern of inequality has also produced conflicting results. Metcalf and Thurow (1970) find that when unemployment falls or when wages increase as a share of personal income,

the distribution of income becomes more equal. Schultz (1969) also emphasizes that a rise in labor's share improves income distribution as long as total income does not fall. Tuckman and Brosch have challenged this result. They claim that in the 1947-1969 period, decreases in family money-income inequality were due to an increase in the share of social insurance transfers and to a decrease in the share of proprietors' income, not to an increase in the labor share.

Part of the confusion may result from thinking too simplistically about labor and profit shares when "labor" has become increasingly heterogeneous. Mirer (1973a) found that for the recession of 1970 better-paying occupations (professional and technical, and managerial workers) suffered a greater loss of potential income than did lower-paying occupations (service workers, general laborers). Gramlich (1974) suggests that during the recession of 1970, workers in lower-paying occupations suffered relatively smaller losses in expected income because a greater proportion of their loss was recouped by transfers. Conceivably, therefore, inequality may actually decrease during a recession. Mirer cautions, however, that these results may be peculiar to the end of the Vietnam War and the resulting heavy unemployment in the high-technology industries.

Table 3 displays some simple regressions on the cyclical pattern of income inequality for two time periods in the postwar period. Table 4 defines the variables. The regressions are similar to those presented by Schultz (1969) and Thurow (1970). Schultz's results were generally inconclusive, while Thurow's use of the Beta distribution prevents a close comparison with these results. One point is striking: the results for the 1955-1969 time period diverge widely from those of the

TABLE 3: THE CYCLICAL PATTERN OF INCOME INEQUALITY FOR
SELECTED TIME PERIODS

Independent Variable	CPS Gini, 1955-1969	CPS Gini, 1947-1973
CONSTANT	-.674	.3614
FEMLFP	.0376 (1.86)*	-.0014 (0.92)
UNEM	.0070 (2.15)*	.0028 (2.14)*
RTGNP	.0020 (2.06)*	.0001 (0.29)
TRAN (\$00's)	-.0130 (1.86)*	.0029 (1.35)
WAGE	.0007 (0.17)	.0011 (0.66)
WPRICE	-.0026 (1.87)*	-.0001 (0.27)
TIME	-.0103 (1.56)	-.0006 (0.55)
R ²	.775	.402
Durbin-Watson	1.58	1.44
No. of observations	14	27

Notes: The dependent variable is presented in Column 4 of Table 1.

*Denotes significance at the 10 percent level. Regressions are ordinary least squares.

TABLE 4: VARIABLE DEFINITIONS

FEMLFP	--	Percent of labor force female
UNEM	--	Civilian labor force unemployment rate
RTGNP	--	Rate of growth of real Gross National Product
TRAN	--	Real transfers per household (\$00's)
WAGE	--	Wages as a percent of personal income
WPRICE	--	Rate of change of wholesale prices
TIME	--	A time trend

Source: Economic Report of the President.

1947-1973 period, reemphasizing a divergence noted in the previous section. The results for 1955-1969 show that increases in the female labor force participation rate, the unemployment rate, and the rate of growth of GNP all increase inequality, while increases in transfers per household and the rate of change of wholesale prices reduce inequality. It is surprising that economic growth, RTGNP, holding constant the wage share and the unemployment rate, should increase inequality. The wage share of personal income is not significantly related to inequality. The results for the 1947-1973 period are generally inconclusive. Only the coefficient on the unemployment rate is significant.

The results of Table 3 are too crude to serve as the basis of a comprehensive analysis of the cyclical pattern, and they are reported only to point up the problem.

III. Summary

The different findings with regard to trend and cycle stem from the fact that the income distribution has been quite stable so that the sign on trend and cycle variable are affected by what may seem to be small differences in definitions and measurement procedures. Even small differences in the method of calculating a standard inequality measure can alter the sign on trend (for example, using class midpoints rather than class means in calculating the Gini coefficient, even with a very large number of income classes; Gastwirth, p. 312). It can be reasonably argued that too much emphasis is being placed on the sign of the secular trend if it is subject to instability from minor factors. The issue, however, carries an enormous emotional and ideological charge, and for that reason there needs to be available a consistent and accurate record of the past, with all the qualifications quantified. This paper has

suggested several problems related to the measurement and interpretation of income inequality. Future research will concentrate on resolving these problems.

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