INSTITUTE FOR RESEARCH ON POVERTY DISCUSSION PAPERS

136-72

THE DISTRIBUTIONAL IMPACT OF THE 1970 RECESSION

THAD W. MIRER

UNIVERSITY OF WISCONSIN - MADISON

THE DISTRIBUTIONAL IMPACT OF THE 1970 RECESSION

Thad W. Mirer

The research reported here was supported by funds granted to the Institute for Research on Poverty at the University of Wisconsin by the Office of Economic Opportunity pursuant to the provisions of the Economic Opportunity Act of 1964. The author, a research associate at the Institute, thanks Geoffrey Carliner, W. Lee Hansen, Robert Haveman, and Irene Lurie for helpful comments, and retains responsibility for all views herein.

July 1972

ABSTRACT

This study analyzes the incidence of the 1970 recession on the distribution of family income. Utilizing the Panel Study of Income Dynamics, families' incomes in 1970 are compared to what they would have been if the macroeconomic conditions of the previous three years had continued to prevail. As measured by proportional income loss, the burden of the recession increased with family income up to $15,000 or $20,000, and then decreased slightly for families with incomes up to $25,000. Above that level the data reveal no generalizable pattern. This pattern of incidence persists when families headed by young or old persons are excluded from the sample, and is supported by evidence on the behavior of aggregate factor incomes.

The analysis indicates that, on average, families with low incomes improved their income positions relative to the rest of the population--despite the fact that 1970 witnessed an increase in the poverty population. In no way does this suggest that the recession was "good for the poor"; even small income losses for some poor families may cause great hardship. In addition, the deleterious effects of the recession may be more lingering than the temporary losses of factor income, for the poor as well as others.

THE DISTRIBUTIONAL IMPACT OF THE 1970 RECESSION

Thad W. Mirer

The loss of aggregate income due to the 1970 recession in the United States is widely recognized and much decried. How the loss has been distributed in society is not so well known and not extensively researched. This paper is concerned with measuring and describing the incidence of the recession on families by income level.

Historical trends in the size distribution of income have been analyzed by Budd [1] and Lampman [3], and its cyclical variability has been studied by Schultz [6], Metcalf [4], Thurow [7], and Mirer [5]. Most of their results suggest that macroeconomic downturns increase income inequality or otherwise bear heavily on the poor and near-poor. This analysis examines micro data from a panel survey to measure the pattern of incidence of the loss of aggregate income in 1970, and finds it to be different from the effects found for past recessions.

Toward the end of the 1960's, the economy was experiencing high employment along with increasing inflation. Restrictive monetary and fiscal policies along with changes in the structure of government expenditure brought about a worsening of economic conditions. In February 1969 the civilian unemployment rate stood at 3.3 percent; it rose above 3.5 percent in September and above 4.0 percent in February 1970. By December 1970 the unemployment rate was 6.1 percent. In 1970 real output declined 0.4 percent from the 1969 level.

In describing the distributional effects of these changes in macroeconomic conditions, it is essential to compare what actually occurred to

what would have occurred under some specified set of alternative conditions. The analytical framework of this study is a comparative statics model in which families' incomes in 1970 are compared to what their incomes would have been then if the aggregate conditions of 1967-1969 had continued. This approach is particularly relevant for policy purposes because it allows one to judge the distributional costs of the restrictive anti-inflationary policies of recent years.

This study focuses on proportional changes in families' incomes. Because it is the distribution of welfare with which one is ultimately concerned, any single measure of income change is essentially arbitrary as a welfare indicator. An examination of proportional income changes preserves all the information available and permits the observer to fashion his own interpretation of welfare effects.

I. ANALYTICAL FRAMEWORK

The distributional impact of dynamic changes in aggregate conditions can be analyzed in a comparative statics framework, albeit with some sacrifice of reality. Consider an economy experiencing steady state growth in which each family's income grows at some constant rate, g_i, over a sequence of m time periods; each family's income experience is completely described by

$$y_i(t) = x_i \cdot (1 + g_i)^t, \; t = t_{k-m}, \; \ldots \; , \; t_{k-1} \qquad (1)$$

where x_i is an income base. In period t_k the economy is jolted from its steady state (a "recession" occurs) and each family's actual income is some $y_i(t_k)$. The impact of this recession on the family can be summarized

in the "realization ratio"

$$r_i \equiv y_i(t_k)/y_i^*(t_k) \qquad (2)$$

where $y_i^*(t_k)$ is the family's "potential income"--the income it would have received if the recession had not occurred, defined by equation (1) with $t = t_k$. This ratio measures the proportion of the family's potential income which it realizes in period t_k.

The "incidence" (or distributional impact) of the recession is summarized by the relation between r and y^* for all families. If r is the same for all families then the inequality of income (say, as measured by the Gini coefficient) actually prevailing in period t_k is the same as would have prevailed during period t_k if the recession had not occurred; if r is a strictly decreasing function of y^*, then the recession will have caused a decrease in the inequality of incomes, in the same sense. Of course, the relation between r and y^* may resemble a stochastic one, in which case an interpretation in terms of changes in inequality is made much more difficult.

Why should r be related to y^*? Roughly speaking, how a family fares during a recession depends on the sources of its income and the way in which each of those types of income varies cyclically. Various studies and data sources show that the composition of family income is related to the level of income: low income families get a great proportion of their income from transfer payments, high income families receive much of their income from dividends and interest, etc. Macroeconomic studies have measured and explained the differential cyclical variability of factor income types. Given these differentials, r should be related to y^* because income composition is related to y^*. Of course, in any income range there

is much variation in family income composition, and hence in examining the incidence of the recession it is expected that there will be a great deal of variation around any smooth pattern which may emerge.

This framework will be used to analyze the incidence of the recession from the Panel Study of Income Dynamics, a data set collected by the Survey Research Center of the University of Michigan under contract with the U.S. Office of Economic Opportunity. This ongoing study has been collecting income and related data from a panel of families since 1967, and contains continuous information for a sample of 4,840 families for the years 1967-1970. In sampling, families with low incomes have been over-represented, leaving data for high-income families relatively thin.

The unit described as the family consists of one or more persons, and corresponds roughly to the Census designation "family or unrelated individual." To isolate the effects of the recession, those families in which the head or the head's spouse changed over the course of the sample period are excluded here. This is done in order to measure income changes of units with relatively continuous income-earning capacity.

The income concept used here is pre-tax total money income, which includes all family members' earnings, transfer payments, and income from capital. Capital gains and losses, which present a different set of conceptual and practical problems, are not included. All income observations are adjusted to "1970 real income," using the GNP deflator. This index is appropriate for adjusting incomes earned throughout the economy, but is not intended to indicate the cost of living.

Three problems arise in implementing the model, concerning: (a) the prediction of families' potential incomes; (b) the relation of this

static model to reality; and (c) the calculation of income growth rates (the g_i in equation (1)).

(a) If incomes were generated by the non-stochastic process described by equation (1), and if $y_i(t_{k-1})$ and g_i were known, then y_i^* could be computed directly. Suppose, however, that steady-state observed incomes contain a random component ε_t,

$$y_i(t) = x_i \cdot (1 + g_i)^t + \varepsilon_t, \quad t = t_{k-m}, \ldots t_{k-1}. \tag{3}$$

In this case, a family's potential income would be defined as its expected income in period t_k if the steady growth state continued,

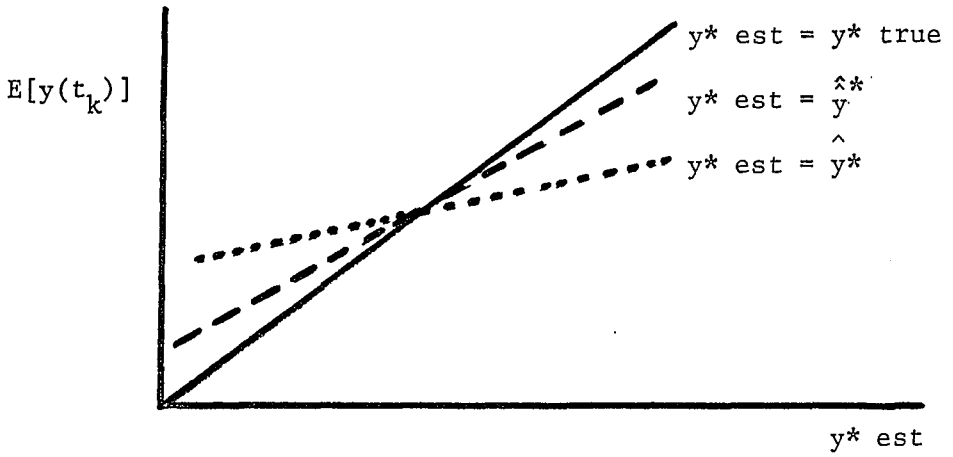
$$y_i^*(t_k) \equiv E[y_i(t_k)]. \tag{4}$$

Its realization ratio,

$$r_i = y_i(t_k)/y_i^*(t_k), \tag{5}$$

would be a random variable, and the incidence of the recession occurring in period t_k would be described by the relation between r and $y^*(t_k)$.

Estimates of $y_i^*(t_k)$ based only on past observations of $y_i(t)$ lead to misinterpretation of the true incidence pattern in this stochastic model. To understand this, suppose there were no recession in period t_k and that incomes continued to be generated according to equation (3) (with the random term being independent of the non-stochastic term). If one knew the value of the non-stochastic term and the distribution of the random term, $y_i^*(t_k)$ would be known by the definition in equation (4). With no recession, $E(r_i) = 1$ for each family, so the population regression functions of $y(t_k)$ on $y^*(t_k)$ and of r on $y^*(t_k)$ would be 45-degree and horizontal lines, respectively, as shown in Figure 1. The second regression yields the interpretation that there is equal (in this case, zero) "incidence" of "no recession."



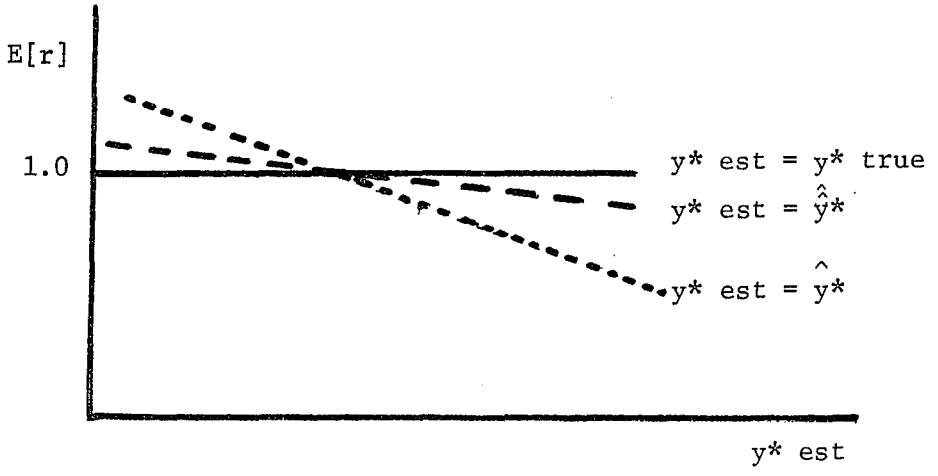


Figure 1. Income and Incidence Patterns in Period t_k with No Recession.

If y_i^* were not known, but estimated using the previous year's income

$$\hat{y}_i^* = y_i(t_{k-1}) \cdot (1 + g_i), \qquad (6)$$

then $\hat{y}_i^*$ would be a biased estimator of y_i^*, in the following sense: for families with $y_i(t_{k-1})$ below the mean, $\hat{y}_i^* < y_i^*$ on average, and vice versa for those above the mean.[1] Thus, the population regression function of y on $\hat{y}_i^*$ would have a slope less than that of the 45-degree line, and the regression of r on $\hat{y}^*$ would have a negative slope, as illustrated in Figure 1. Clearly, an interpretation of the relation between r and $\hat{y}^*$ as a statement about the relation between r and true y^* is biased in a known manner: the former relation suggests that there is "unequal incidence" of "no recession"--which is not possible under the stated definitions.

If, instead, y_i^* were estimated using several previous years' observed incomes

$$\hat{\hat{y}}_i^*(t_k) = \frac{1}{n} \sum_{j=1}^{n} y_i(t_{k-j}) \cdot (1 + g_i)^j, \quad 1 < n \leq m, \qquad (7)$$

The spuriousness of an interpretation given to the relation between r and estimated y^* as a statement about the true incidence pattern would be attenuated. The more observations used in this estimation, the less would be the problem of biased interpretation: $\hat{\hat{y}}_i^*$ is a better predictor of y_i^* than is $\hat{y}_i^*$.

In this study, each family's potential income, y_i^*, will be estimated using three years' observations, and the relation between r and $\hat{\hat{y}}^*$ will be interpreted as the true pattern of incidence--i.e., as the relation between r and true y^*. The reduction in bias achieved by using three observations rather than one to estimate y_i^* can be expected to be substantial, though not complete.[2]

(b) To predict a family's potential income (y_i^*) if the economy had remained on its growth path through 1970, the economic conditions of 1967, 1968, and 1969 are assumed to characterize this steady-state growth. In fact, 1969 marked a transition between full employment and recession. By including 1969, calculation of y_i^* according to equation (7) tends to underestimate the y_i^* that would be predicted from the events of 1967-68. This causes the estimates of r_i to be overestimates.

Rather than adjust the 1969 observations, or omit them, the results will be presented with the understanding that r_i tends to be overestimated.

(c) The growth ratios (g_i) to be used in these calculations are determined somewhat arbitrarily. At one extreme, it would be possible to estimate the implicit growth rate in each family's income assuming a model such as (3); at the other, a common growth rate might be assumed to hold for all families.

Life-cycle concepts of income-earning behavior suggest that growth rates in real income vary by age because of changes in labor productivity and asset accumulation; in general, one expects the growth rate of families' total incomes to vary inversely with age. It is assumed here that the growth rate of each family's income depends only on the age of its head, and that families in the same age class have a common rate.

To determine these rates, the income aggregates from the micro data sample are totaled for each age class, for each year, and the implicit growth rates are calculated and presented in Table 1. Examining the ratios between income aggregates of 1968 and 1967 (column 1), the rates are found to decline with age, as expected; for 1968-69 the rates also decline with age, with one exception. The implicit income growth rates for all age classes decline from 1967-68 to 1968-69, reflecting the transitional nature of 1969 between full employment and recession states.

Table 1

Growth Rates for Real Family Income (percent)

Age Class	(1) 1967-68	(2) 1968-69	(3) 1969-70 [a]
under 25	16.22	8.62	12.36
25-34	10.39	4.82	7.57
35-44	8.99	6.48	7.73
45-54	5.68	2.79	4.22
55-64	2.21	2.70	2.46
65 and over	1.28	0.30	0.79
All	6.29	3.91	5.09

[a]The potential growth rate for 1969-70 is calculated as the geometric mean of the two previous corresponding growth rates.

In a slight departure from the model leading to equation (7), the actual growth rates for 1967-68 and 1968-69 along with the potential growth rates for 1969-70 (calculated as the geometric mean of the previous two rates) are used to calculate each family's potential income in 1970, y_i^*. In the context of equation (7), each age-specific growth rate, g_i, is considered to vary over time. The family's estimated potential income represents the expected value of its income if the conditions prevailing in 1967-69 had continued.

In summary, for each family in the micro sample the 1970 income realization ratio defined in equation (5) is estimated according to the procedures described above. The impact of the recession,[3] or its "incidence," will be analyzed by examining the relation between r and y^*.

II. RESULTS

A. The Incidence Pattern

The impact of the recession on each family, as measured by its 1970 income realization ratio, is calculated by the procedure described in the previous section. Two methods of analyzing the resulting family data are used here in order to describe the incidence of the recession: calculating class means and fitting descriptive regressions.

Table 2 shows the sample sizes, the mean income ratios, and their standard deviations for selected income classes of the entire family sample. The striking result of these figures is that the mean realization ratios decline as incomes increase up to $20,000. In the range $20,000-$25,000 the income ratios are higher than for slightly lower incomes, while above $25,000 the sample density becomes much lower, and the mean ratios become highly erratic. The standard deviations of the distribution of

Table 2

Family Income Realization Ratios (entire sample)

Potential Income, y^* (in $ thousands)	Sample Size	Mean r_i	S.D. of r_i
less than 1	27	1.278	.696
1 - 2	189	1.068	.442
2 - 3	248	1.048	.493
3 - 4	298	1.050	.542
4 - 5	276	1.025	.369
5 - 6	253	1.054	.378
6 - 7	209	1.037	.347
7 - 8	241	.988	.343
8 - 9	219	.964	.364
9 - 10	214	.971	.259
10 - 11	172	1.005	.333
11 - 12	162	.935	.286
12 - 13	166	.945	.251
13 - 14	121	.919	.240
14 - 15	124	.934	.223
15 - 16	84	.929	.163
16 - 17	93	.952	.285
17 - 18	77	.919	.183
18 - 19	61	.941	.281
19 - 20	51	.912	.176
20 - 21	30	.913	.246
21 - 22	36	1.027	.269
22 - 23	26	.961	.184
23 - 24	26	.977	.249
24 - 25	23	.974	.178
25 - 27.5	31	.856	.184
27.5- 30	29	.830	.231
30 - 32.5	15	.985	.241
32.5- 35	9	1.178	.373
35 - 37.5	8	1.017	.326
37.5- 40	7	.663	.254
40 - 45	4	1.209	.173
45 - 50	3	.867	.158
50 - 60	5	.892	.452
60 - 70	3	.911	.247
70 - 80	1	.582	.000
80 - 90	2	.415	.058
90 - 100	1	1.081	.000
more than 100	0		
Total	3,544		

the income ratios in each age class are quite large, indicating the great variation around this pattern of means.

The incidence of the recession can also be analyzed by fitting a descriptive regression to the family data, an approach which is especially useful for comparative purposes. In order to increase precision of the fits in the range of incomes where the sample is most dense, families with potential incomes above $25,000 are excluded from this description. The results of fitting r as a third-degree polynomial in y^* are given in the first row of Table 3. The predicted regression line is graphed in Figure 2, along with the class means for the included income intervals (from Table 2). The broken line shows the realization ratio for aggregate family income, (including that of families with incomes above $25,000).[4]

Both approaches to describing the family data yield the same interpretation. For families with potential incomes below $25,000, the recession leaves poor families better off than average, and possibly better off absolutely.[5] Middle income families ($10,000-$20,000) bear a heavier than average burden. An upper-middle class group of families ($20,000-$25,000) appear to be somewhat better off than average, although the data become thin in this range. As a description of the incidence of the recession, this pattern must be accepted with the understanding that there is considerable variation around it.

For families with potential incomes above $25,000, no clear pattern emerges, possibly because of the low sample density. Grouping the classes of Table 2 makes each class larger, but mixes together families which are hypothesized to bear unequal burdens. Together, all the families above $25,000 have a realization ratio of .897 which is lower than any of the classes with incomes below $25,000. Separating the well-off into two

Table 3

Descriptive Regressions (Third degree polynomial)

Base	Ages	Const.	y^*	$(y^*)^2$	$(y^*)^3$	R^2	F	Sample Size
Three year	18 and over	1.111 (.029)	-.01680 (.01049)	.00007383 (.00102808)	.00001684 (.00002879)	.018	21.4	3426
Three year	18 - 65	1.154 (.035)	-.02583 (.01204)	.0007064 (.0011439)	.000002939 (.000031377)	.023	22.5	2933
Three year	25 - 65	1.130 (.035)	-.02206 (.01179)	.0005395 (.0011165)	.000004972 (.000030558)	.019	18.6	2842
One year[3]	18 and over	1.311 (.033)	-.07445 (.01164)	.004786 (.001137)	-.0001008 (.0000318)	.048	56.7	3360

NOTES: (1) Parentheses contain standard errors; y^* is in $ thousands.

(2) All samples are for families with potential incomes less than $25,000.

(3) For the one year base, families with potential incomes less than $1,000 are excluded.

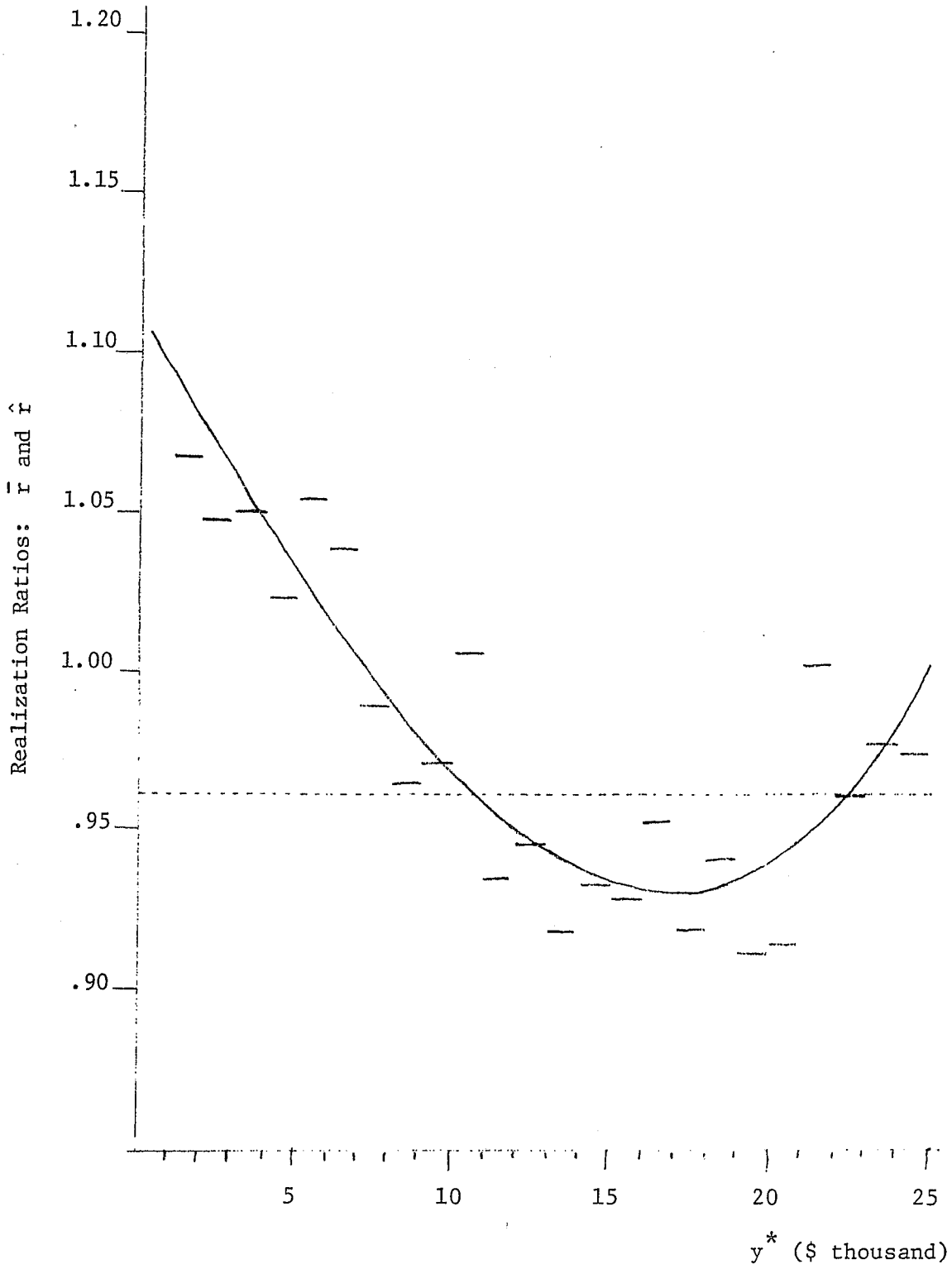


Figure 2. Family Income Realization Ratios
Ages 18 and over
Class means and Fitted relation

classes, $\bar{r}$ = .907 for incomes of \$25,000-\$50,000 and $\bar{r}$ = .807 in the range above \$50,000, suggesting that r is a declining function of y^* above \$25,000. However, no definite conclusion for the rich is warranted from these data because of small sample sizes. Also, the concept of income used in this study is not well-suited for the rich, because their economic well-being is very dependent on wealth effects (capital gains and losses).

The conventional wisdom about the impact of recessions is that the poor and the lower-middle classes are hurt relatively more than others. Compared to this, the incidence pattern shown in the data here is surprising. Some further checks on the validity of this finding are made below, and corroborating evidence from aggregate data is presented in Section III.

B. Extensions

(1) Families with very young or very old heads are likely to experience major income changes which are not caused by macroeconomic conditions: young persons may leave school and enter the labor force, and old persons may retire. To see if this behavior has influenced the pattern of incidence which has been attributed to the recession, the pattern of realization ratios was examined for subsamples of the population. Among families whose potential incomes are less than \$25,000, Figure 3 and Table 3 compare the third-degree polynomial fits for families with heads aged 18 and over, 18-65, and 25-65, respectively. There is little difference between the fits, indicating that the overall pattern is not strongly influenced by any differential labor force entry and exit rates between income classes.

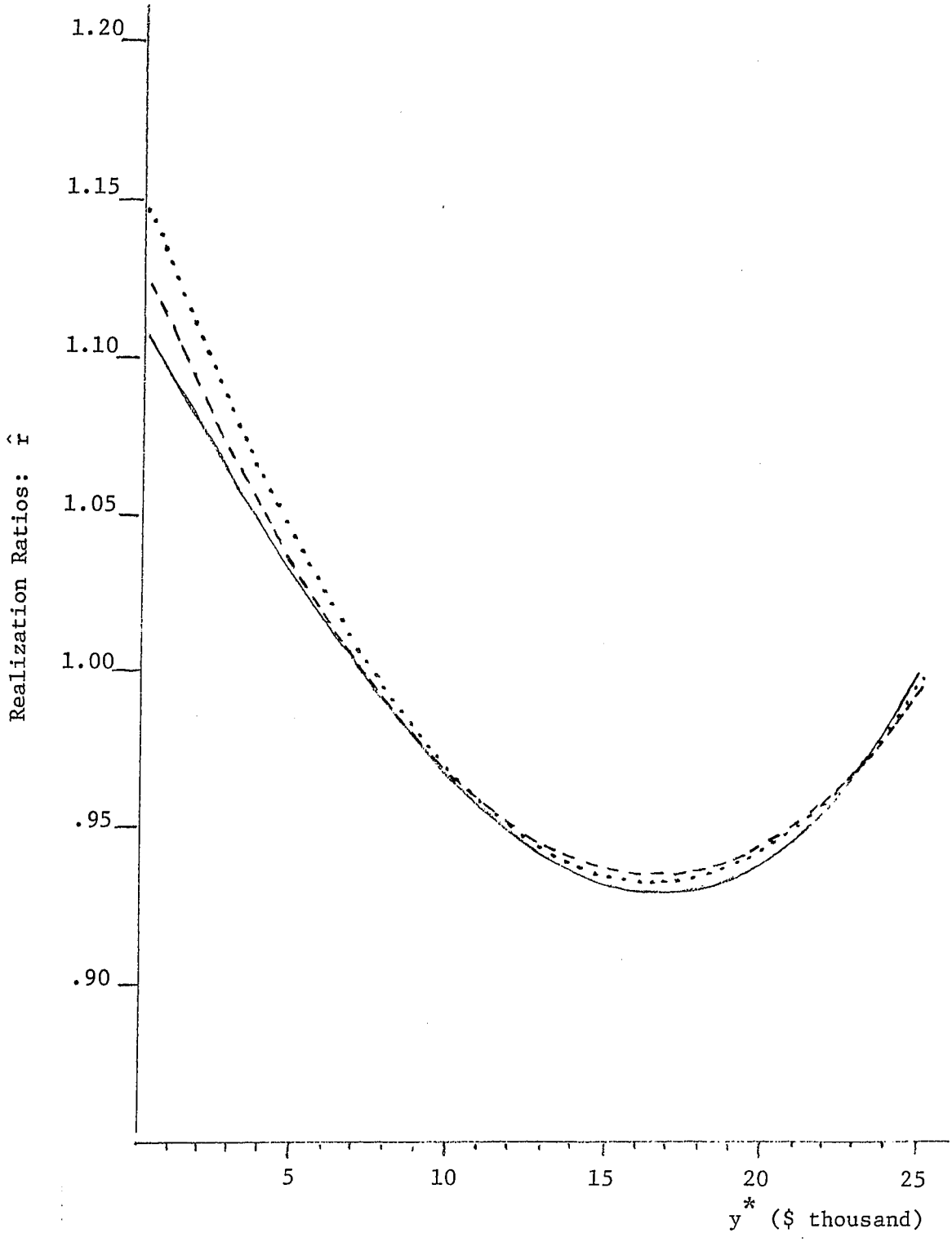


Figure 3. Family Income Realization Ratios

——— Ages 18 and over
. . . Ages 18-65
- - - Ages 25-65
Fitted Relations

(2) The method of using a three-year average to estimate each y_i^* (equation (7)) was adopted in order to attenuate a possible bias in the interpretation of the incidence pattern when potential income is estimated from past income observations. It is curious that the negative relation actually found between r and $\hat{y}^*$ for incomes up to \$15,000 or \$20,000 resembles the pattern which would be expected from that bias. Are the findings here based on the spurious regression-to-the-mean phenomenon?

For comparison, the realization ratios were recalculated using only a one-year base (1969 observed income) for predicting potential income (equation (6)), with the potential 1969-70 growth rates given in Table 1. The third-degree fit to the resulting realization ratios[6] is shown in Figure 4, along with the fit for the three-year base already presented in Figure 1. As expected, for low incomes the ratios are higher with the one-year base than with the three-year base, and vice versa for higher incomes. Since it is expected that most of the distortion has been eliminated in using the three-year base, and since both fits are similarly downward sloped in the range of incomes under \$10,000, it seems clear that the incidence pattern resulting from unbiased estimates of each potential income would also display this downward sloping pattern.

(3) The Current Population Surveys estimate that the proportion of the population definable as poor increased from 1969 to 1970--for persons, families and most demographic subgroups [8, cf. #76 and 81]. Is the incidence pattern found here consistent with these facts?

Two approaches to examining the data yield paradoxically different conclusions. The indirect approach is to consider the incidence pattern ($r = g(y^*)$) as defining a transformation of y^* into y--i.e., $y = f(y^*)$.

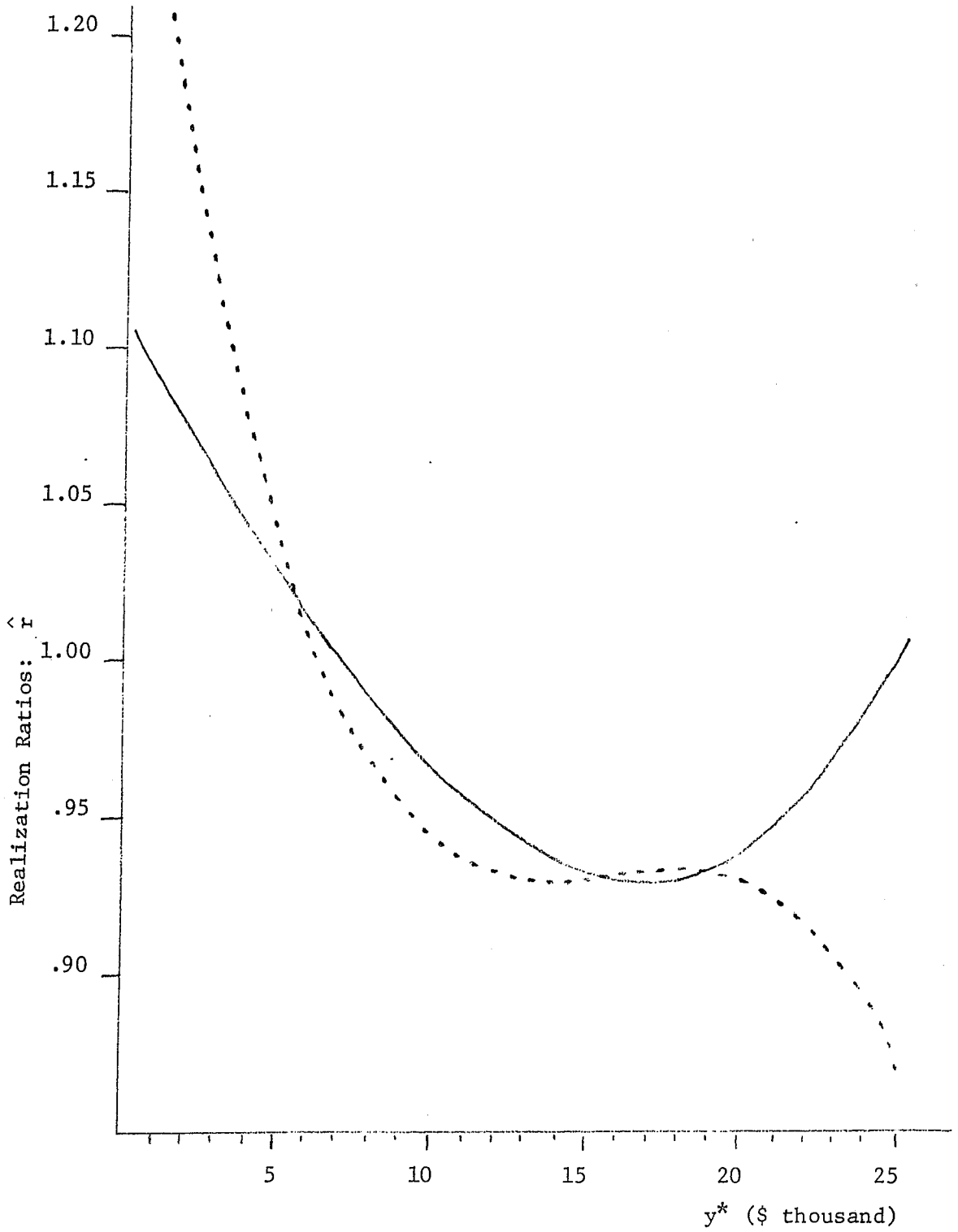


Figure 4. Family Income Realization Ratios

Ages 18 and over
——— Three-year base
- - - One-year base
Fitted Relations

From the fitted relation between r and y* shown in Figure 2, y is found to be a steadily increasing function of y* and at a level nearly $200 greater than y* in the range of the poverty line. From this, one might predict that the number of families in poverty would decrease as a result of the recession!

The direct approach is to count the number of families definable as poor.[7] Only 12.0 percent of families classified by their potential (non-recession) incomes are poor, while 14.6 percent are poor according to their actual (recession) incomes. When looked at directly, the data show that the effect of the recession is to increase the number of families in poverty. (Also, when measured by actual incomes, the number in poverty increased from 14.5 percent in 1969 to 14.6 percent in 1970.)

An explanation for the paradoxical difference between the interpretations given to the incidence pattern and to the poverty count rests on the concepts of permanent and transitory income. The method used to estimate each family's potential income (equation (7)) can be considered to estimate its "permanent" income. If there there were no recession in 1970, a greater proportion of the population would be poor according to their observed incomes than would be poor according to their potential incomes. (This depends on the poverty line being fixed at less than the mean income and rests on the fact that the variance among families' observed incomes would be greater than that among their potential (i.e., permanent) incomes because of the addition of a transitory component.) Thus, even if the incidence pattern of the 1970 recession made the "potentially" poor somewhat better-off than average (like the pattern found here) there could still be more families actually poor than potentially poor.

Relating actual to potential (or "permanent") incomes is a conceptually valid approach to determine the incidence of the recession. It remains difficult, however, to use this interpretation of incidence for making predictions or statements about observed distributional income, and the number of families below any poverty line.

III. THE BEHAVIOR OF INCOME AGGREGATES

Differences in family income realization ratios depend, in large part, on differences in the sources of income received by families. Therefore, a partial explanation for the incidence pattern in the micro data can be derived from an examination of changes in income aggregates. While a fully specified macroeconomic model would be needed to explain these changes, the comparative statics framework developed in Section I can be used to measure them.

Assuming the economy is growing in a steady state fashion, each income type, Y_j, will be growing at some rate B_j:

$$Y_j = A_j \cdot (1 + B_j)^t. \tag{8}$$

This income growth path can be estimated by fitting the regression

$$\log Y_j = \alpha_j + \log(1 + B_j) \cdot t + \varepsilon_j \tag{9}$$

to data for the period assumed to be characterized by constant growth. From this growth path the potential income, Y_j^*, of each type in period t_k can be calculated. The realization ratio

$$R_j(t_k) = Y_j(t_k)/Y_j^*(t_k) \tag{10}$$

measures the impact of the recession on the jth income type in period t_k.

This simple measurement model is applied first to quarterly data for the major components of Personal Income [9]. Table 4 lists these income

types. Twelve quarterly observations 1967-69 are used to estimate the full employment growth paths, and the realization ratios for the fourth quarter and the whole of 1970 are computed (see Table 4). The increase in transfer payments, which is partially a response to losses of earned income due to unemployment, was a force to support the incomes of the poor. The considerable decline of dividends income from its potential level suggests that many rich people (about whom the micro data reveal little information) suffered a considerable income loss.[8]

More insight into the proximate causes of the incidence of the recession is gained by disaggregating Labor Income, which amounts to nearly seventy percent of Personal Income. In the terms of production theory, it is hypothesized that the labor services performed by persons in different occupations are separate factors of production and not perfect substitutes. The aggregate income accruing to each of these factors varies differently over the cycle.

Data on income by occupation can be constructed on a yearly basis from component data reported by the Current Population Survey [8], and here are blown up to the labor income control totals of the Personal Income series.[9] Equation (9) is fit using three data points (1967-69), and the recession's impact on each labor type is measured as in (10). Table 5 presents these results, as well as mean male earnings and the distribution of persons with earnings by occupation in 1970.

The best paying occupations (professional-technical, and managerial classifications) suffered a greater loss of potential income than did some low-paying ones (service workers, general non-farm laborers, and farm workers). This evidence makes more credible the incidence findings in Section I.

Table 4

Income Realization Ratios for Income Aggregates

Income Type	(1) Pct. Share 1970	(2) R_j 1970	(3) R_j (1970 IV)
Transfers	9.55	1.057	1.075
Rent	2.80	.999	1.000
Interest	7.77	.983	.973
Business and Professional Proprietary	6.13	.970	.964
Labor Income[a]	68.81	.958	.932
Dividends	3.00	.941	.915
Farm Proprietary	1.90	.899	.792
Total (Personal Income)	100.	.969	.948

[a]Sum of "Wages and Salaries" and "Other Labor Income" in the national accounts.

Table 5

Labor Income Realization Ratios by Occupation

	(1) Percent of Employed Persons 1970	(2) R_j (1970)	(3) Mean 1970 Male Earnings
Service Workers (exc. pvt. hshld.)	12.6	1.176	$ 4,643
Laborers (exc. farm and mine)	5.9	1.081	3,629
Private Household Workers	2.9	1.074	1,787
Farm managers	2.1	1.054	4,433
Farm laborers	2.2	1.030	1,644
Sales workers	6.5	.984	7,989
Managers	9.6	.980	12,001
Clerical workers	16.9	.951	6,872
Professional and technical workers	13.2	.929	11,955
Craftsmen	11.6	.924	8,212
Operatives	16.5	.876	6,246

One might hypothesize that the impact of the recession on different occupations changes over time in such a way as to make the low income occupations bear a heavier burden as time passes: this would be the normal working-out of multiplier effects. A cursory examination of employment data does not support this hypothesis during 1970. Further, one might hypothesize that 1971 is more aptly described as a steady state recession period than is 1970. While this probably is true, the micro data for such an incidence analysis are not yet available, and aggregate earnings data by occupation after December 1970 are not comparable to those for the preceding period because of major changes in classifications.

IV. CONCLUSION

The panel survey data examined in this study indicate that the income loss due to the recession in 1970 varied systematically by income level. The burden (measured as proportional income loss) increased with family income up to $15,000 or $20,000, and then decreased slightly for families with incomes up to $25,000. Above this level the data reveal no generalizable pattern.

This pattern of incidence persists when families headed by young or old persons are excluded from the sample, and is found not to be a spurious result caused by regression-to-the-mean phenomena. Corroborating evidence for the pattern is found in the behavior of aggregate factor incomes.

The analysis indicates that on average, families who could expect to have low incomes temporarily improved their income positions relative to the rest of the population, despite the fact that 1970 witnessed an increase in the poverty population. In no way does this suggest that the recession was "good for the poor"; even small income losses for poor families cause

great hardship. For the poor as well as others, the deleterious effects of the recession may be more lingering than the temporary losses of factor income: the recession led to a general belt-tightening in the public and private and public sectors of the economy, leading to a diminution of programs and services aimed at developing human capital and promoting individuals' welfare.

FOOTNOTES

[1]The problem of analyzing incomes which are hypothesized to be generated according to a stochastic model is an application of the classical errors-in-variables problem in regression analysis, which results in the so-called regression-to-the-mean phenomenon. Milton Friedman [2] has made this problem familiar to economists. The crux of the matter is that, among any period's observations, observed income is positively correlated with "transitory income": let $y = x + u$; if x and u are independent and if u has non-zero variance, then y and u are positively correlated; thus for an observation y_i which happens to be less than $\bar{y}$ in value, the transitory component (u) will be negative, on average. In Friedman's terms, this year's actual income is a biased predictor of the family's permanent income, and hence a biased predictor of next year's income.

[2]Burt Barnow and others corrected an error in my thinking on this point.

[3]It is implicitly assumed here that all income changes in 1970 (relative to what is predicted from previous income history) are caused by what economists might agree to call the "recession." Any family income changes which are truly exogenous are incorrectly attributed. Only if these exogenous changes are related to family income levels would there be a problem of misinterpreting the incidence of the recession.

[4]While the regression accounts for little of the overall variation in the sample r's, the incidence pattern is signficant (at less than the .0001 level) as judged by the F ratio. The second degree fit is essentially the same as this, and has all coefficients statistically significant; the third degree is reported to allow a fuller description of the pattern inherent in the data, and for later comparisons.

[5]As noted on p.8, the estimates of r_i are considered to be over-estimates--all in the same proportion, to a first approximation.

[6]For this fit, families with potential incomes below $1,000 were excluded in order to reduce the distortion of fit: the mean realization ratio for these excluded families is 2.20.

[7]For this, the Survey Research Center's definitions of poverty (which differ from the official ones) were used.

[8]Undistributed corporate profits, which affect mainly the rich by increasing the value of stocks, achieve a realization ratio of .879 for 1970 (.807 for 1970 IV).

[9]The CPS data actually are for total money earnings, and include self-employment income--which is not included in the National Income accounts as Labor Income. This difference is negligible for the use to which these data are put.

REFERENCES

[1] E.C. Budd. "Postwar Changes in the Size Distribution of Income in the U.S." American Economic Review 60 (May 1970).

[2] M. Friedman. A Theory of the Consumption Function. Princeton: Princeton University Press, 1957 (NBER, General Series, #63).

[3] R.J. Lampman. Ends and Means of Reducing Income Poverty. Chicago: Markham Publishing Co. (Institute for Research on Poverty Monograph Series), 1971.

[4] C.E. Metcalf. "The Size Distribution of Personal Income During the Business Cycle." American Economic Review 59 (September 1969).

[5] T.W. Mirer. "The Effects of Macroeconomic Fluctuations on the Distribution of Income." Institute for Research on Poverty Discussion Paper 110-72, January 1972.

[6] T.P. Schultz. "Secular Trends and Cyclical Behavior of Income Distribution in the United States: 1944-1965." In L. Soltow, ed., Six Papers on the Size Distribution of Wealth and Income (NBER Studies in Income and Wealth #33). New York: NBER, 1969.

[7] L.C. Thurow. "Analyzing the American Income Distribution." American Economic Review 60 (May 1970).

[8] U.S. Bureau of the Census. Current Population Reports. Series P-60, "Consumer Income," various issues.

[9] U.S. Office of Business Economics. Survey of Current Business. Various issues.