A surge in growing income inequality?

Examination of a reported surge in income inequality in 1993 indicates that, despite changes in survey methodology, patterns of employment growth were consistent with greater income dispersion

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Last fall, the Census Bureau announced that in 1993 incomes had dropped and poverty had increased. The Agency also reported that income inequality had risen.[1] The latter piece of news received much attention, similarly to other reports in recent years that have focused on the growing dispersion in the distribution of household incomes.

Inequalities of various kinds in the United States have become a popular topic in the media. But growing income inequality is particularly worrisome because of its immediate implications for social conflict and tension. The economist Paul Krugman recently wrote: "The ultimate effect[s] of growing economic disparities on our social and political health may be hard to predict, but they are unlikely to be pleasant."[2] Krugman's statement is significant because the size of the 1992–93 increase in income inequality reported by the Census Bureau could be easily characterized as a surge. The Gini index, one of the tools the Agency uses to measure income inequality, rose from .434 in 1992 to .447 in 1993, the largest 1-year increase since the statistical series on household income inequality began in 1967.[3] (See chart 1.) But this apparent surge was qualified by the Census Bureau in its analysis of the data.

The Census Bureau cautioned that the size of the increase may have been an artifact of technical changes made in how the data on income were collected in the Current Population Survey (CPS).[4] In addition, other changes to the CPS could have affected the income data for 1993.

The increase in inequality nevertheless occurred at a time when an increase might have been anticipated. The recession of 1990–91 had an unusually strong impact on well-paid white-collar workers caught in the downsizing of much of corporate America. In the ensuing recovery between 1991 and 1993, many of these workers resumed their full-time careers. Not only was employment rising and unemployment falling, but according to the Bureau of Labor Statistics, when the data are stratified by occupation, most of the net increase in employment in the 1992–93 period occurred in jobs paying above-average wages.[5] The question therefore becomes, How much of the increase in income inequality between 1992 and 1993 was due to changes in the economy, and how much was due to technical changes in the CPS?

This article explores both aspects of this question in a descriptive way, to provide users with further evidence concerning the issue of rising income inequality between 1992 and 1993. First, CPS income data are discussed—in particular, changes that were made in the collection of the 1993 data. Then, long-run and short-run trends in household income inequality are reviewed. Next, the 1992–93 changes are examined, first from the standpoint of the technical changes in the CPS and then from the standpoint of the changes that took place in the economy. Finally, the conclusions of the analysis are presented.

CPS data and technical changes

The CPS, of course, is one of the primary sources of income data used by researchers for measuring and studying how the Nation's income (as well as earnings) distribution has changed. A

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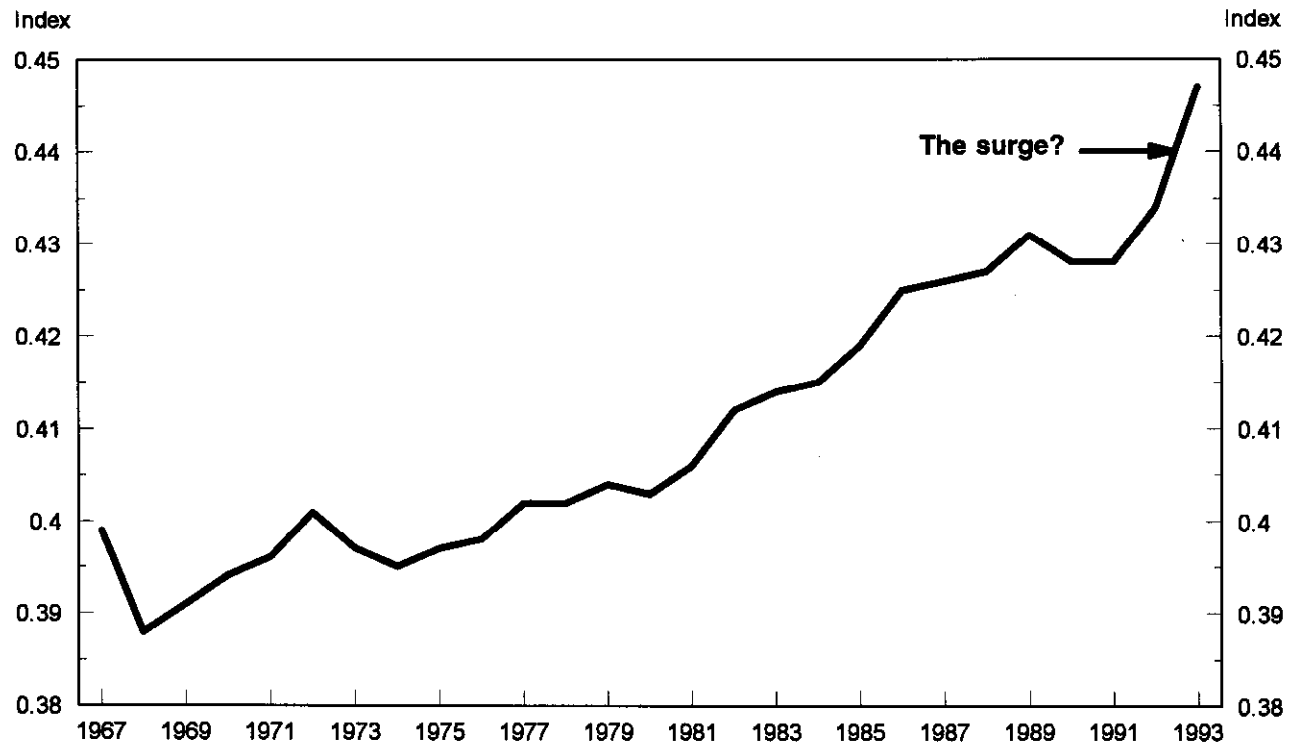
survey of some 60,000 households, the CPS is designed to measure employment and unemployment each month for the Bureau of Labor Statistics by means of a series of questions relating to current labor force activity. In March, an additional series of questions, called the Annual Demographic Supplement, is asked. These questions concern the work experience and the sources and amounts of income of survey members in the previous calendar year.

Concept and limitations. The CPS questions on income relate to *money* income only (that is, they exclude all noncash income items, such as food stamps and employer-provided health insurance, as well as any capital gains), *before* deductions for Federal, State, and local taxes are applied. Money income is broken down into labor market money income (wage and salary earnings, as well as farm and nonfarm self-employment income) and non-labor-market money income (for example, interest, dividends, and pensions).

The money income data collected in the CPS also contain certain limitations. Underreporting of income and truncation bias are two limitations that have particular significance for studying income inequality. Because the CPS is based on a probability sample of households, all the estimates derived from it are subject to sampling and nonsampling errors. The income estimates are known to be biased downward due to nonsampling error (relating, for example, to noninterviews, undercoverage, inaccurate responses, and missing data). For 1990, the CPS collected data on 88 percent of aggregate income derived from independent estimates. While it did quite well for wages and salaries (accounting for 97 percent of such income), it did poorly for dividend income (garnering information on only 33 percent of this source of income).[6] Obviously, underreporting of income can affect income inequality measurements, because both the receipt and the amounts of certain income items vary across the distribution.

Truncation bias occurs as a result of the suppression of income amounts above a certain upper limit. These amounts are suppressed in order to reduce the effects of interviewer error and to provide confidentiality to survey respondents. However, the limits, or top codes, can be problematic in the measurement of income inequality:[7] if the distribution is becoming more unequal as a result of rising incomes at the upper end, top codes will bias measurements of income inequality downward, because the high incomes will be suppressed. Constant nominal-dollar top codes have been used in the CPS questionnaire and are increased from time to time to accommodate rising incomes. While one-time adjustments

Chart 1. **Gini index, household income distribution, 1967–93**



reduce truncation bias, the top codes will eventually become problematic again.

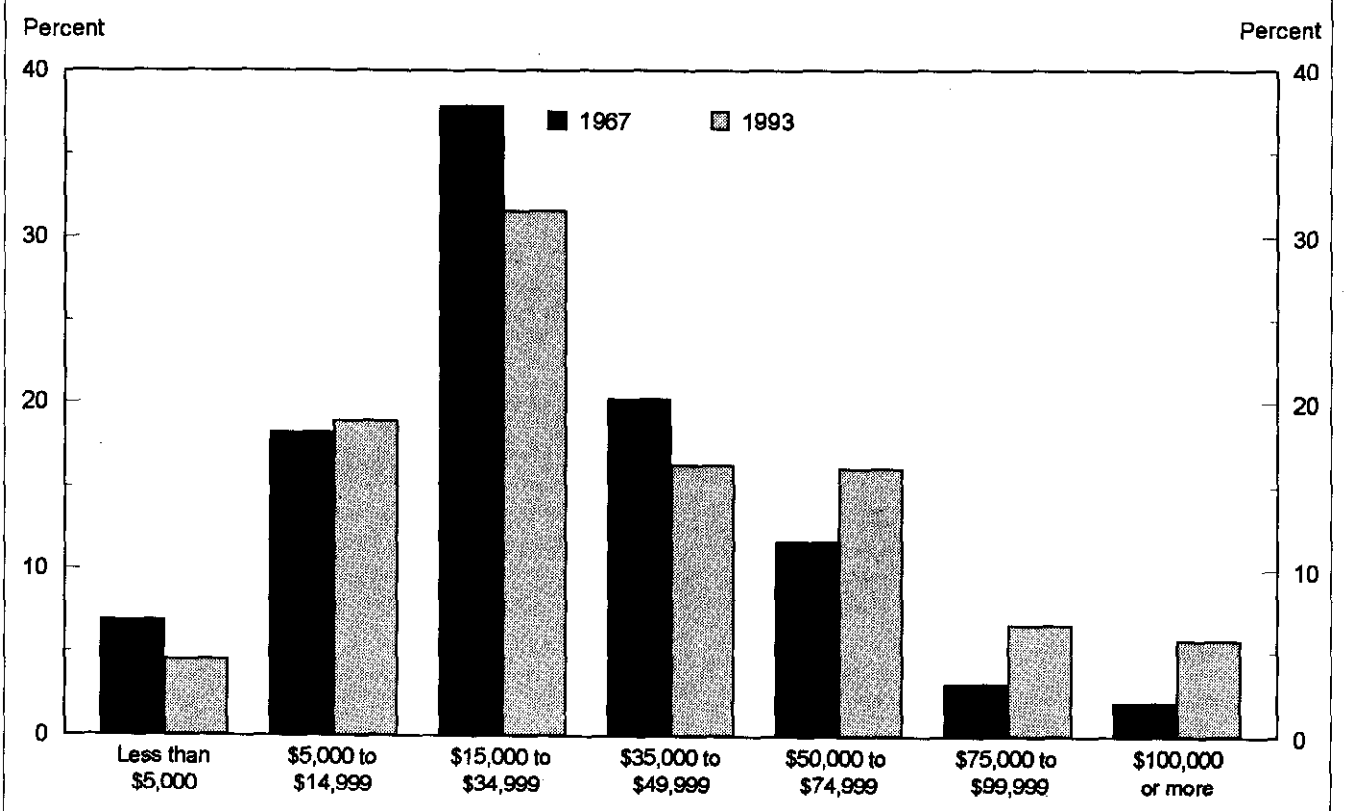
Technical changes. During the 1980's and early 1990's, the Bureau of Labor Statistics, with the assistance of the Census Bureau, was engaged in an effort to modernize the monthly CPS. In general, the focus of the modernization was on redesigning the monthly labor force questionnaire and introducing a system known as computer-assisted survey information collection (CASIC). Beginning in January of 1994, the new CPS was put into operation. The redesign had implications for the Annual Demographic Supplement conducted in March of that year. While the questions on work experience and income concerning calendar year 1993 were not changed from those of previous years, the new CASIC system was used.

The CASIC technology replaced the traditional paper-and-pencil interviewing procedure. In that procedure, two separate questionnaires—the Monthly Labor Force questionnaire and the Annual Demographic Supplement questionnaire—were filled out by the CPS enumerator in the course of the March interview. In the CASIC system, all the CPS questions are administered from a computer (either a laptop or a computer located in a centralized telephoning facility), as if only one questionnaire is in use. Unlike previous March CPS interviews, in which the interviewer had to physically shift from the labor force questionnaire to that on work experience and income, the mechanics of CASIC avoid any significant interruption of the interview process.

In addition to this change in mode of interview, two other technical changes occurred in the March 1994 CPS that could affect income data and the measurement of income inequality for 1993.[8] First, as occurs after every decennial census of the population, data from Census Bureau surveys are reweighted in accordance with estimates of the civilian noninstitutional population derived from the most recent decennial census. The CPS income data for 1993 reflect new weights derived from the 1990 census, and they have also been adjusted for the estimated census undercount.

The second change concerns top codes. As mentioned earlier, top codes used in the CPS are occasionally increased to reflect rising nominal incomes; such an increase occurred in the March 1994 CPS. The most important top code that was increased related to earnings from the longest job or business. It was increased from $299,999 to $999,999 be-

Chart 2. **Percent distribution of households by money income, 1967 and 1993**



NOTE: 1967 incomes are in constant 1993 dollars.

Table 1. Shares of aggregate household income received by each fifth and top 5 percent of households, 1967–93

[In percent]

Year	Lowest fifth	Second fifth	Third fifth	Fourth fifth	Highest fifth	Top 5 percent	Gini index
1967	4.0	10.8	17.3	24.2	43.8	17.5	0.399
1968	4.2	11.1	17.5	24.4	42.8	16.6	.388
1969	4.1	10.9	17.5	24.5	43.0	16.6	.391
1970	4.1	10.8	17.4	24.5	43.3	16.6	.394
1971[1]	4.1	10.6	17.3	24.5	43.5	16.7	.396
1972	4.1	10.5	17.1	24.5	43.9	17.0	.401
1973	4.2	10.5	17.1	24.6	43.6	16.6	.397
1974	4.3	10.6	17.0	24.6	43.5	16.5	.395
1975	4.3	10.4	17.0	24.7	43.6	16.6	.397
1976	4.3	10.3	17.0	24.7	43.7	16.6	.398
1977	4.2	10.2	16.9	24.7	44.0	16.8	.402
1978	4.2	10.2	16.9	24.7	44.1	16.8	.402
1979[2]	4.1	10.2	16.8	24.7	44.2	16.9	.404
1980	4.2	10.2	16.8	24.8	44.1	16.5	.403
1981	4.1	10.1	16.7	24.8	44.4	16.5	.406
1982	4.0	10.0	16.5	24.5	45.0	17.0	.412
1983	4.0	9.9	16.4	24.6	45.1	17.1	.414
1984	4.0	9.9	16.3	24.6	45.2	17.1	.415
1985[3]	3.9	9.8	16.2	24.4	45.6	17.6	.419
1986	3.8	9.7	16.2	24.3	46.1	18.0	.425
1987	3.8	9.6	16.1	24.3	46.2	18.2	.426
1988	3.8	9.6	16.0	24.3	46.3	18.3	.427
1989	3.8	9.5	15.8	24.0	46.8	18.9	.431
1990	3.9	9.6	15.9	24.0	46.6	18.6	.428
1991	3.8	9.6	15.9	24.2	46.5	18.1	.428
1992	3.8	9.4	15.8	24.2	46.9	18.6	.433
1992[4]	3.8	9.4	15.8	24.2	46.9	18.6	.434
1993[5]	3.6	9.1	15.3	23.8	48.2	20.0	.447
1993[6]	3.6	9.0	15.1	23.5	48.9	21.0	.454

[1] Implementation of weights derived from 1970 population census.

[2] Implementation of weights derived from 1980 population census.

[3] Upper limit for earnings from longest job or business raised to $299,999; upper limits for other income items also raised.

[4] Implementation of weights derived from 1990 population census.

[5] Upper limits in effect in 1992 applied to 1993 income data.

[6] Introduction of CASIC; upper limit for earnings from longest job or business raised to $999,999; upper limits for other income items also raised. (See footnote 9 in text.)

tween 1992 and 1993.[9] The last time a change was made on this top code was in March 1986, for the survey year 1985, when it was raised from $99,999 to $299,999.

Trends in inequality

Chart 2 depicts how the Nation's household income distribution changed between 1967 (in 1993 dollars) and 1993.[10] Clearly, there was a shift to the right, with greater proportions of households in 1993 having incomes above $50,000 than in 1967 (28.8 percent, compared with 16.8 percent), a much smaller proportion with incomes between $15,000 and $50,000 (31.0 percent, compared with 39.3 percent), and slightly fewer below $15,000 (23.4 percent, compared with 25.1 percent). Median household income grew from $28,434 in 1967 to $33,685 by 1989, but then declined to $31,241 in 1993, largely reflecting the recession of the early 1990's. Had the rate of growth in median household income occurred uniformly across the entire distribution from 1967 to 1993, there would have been no change in inequality.

In measuring inequality, the Census Bureau ranks household incomes from poorest to richest and then divides them into equal quantiles. From such a rearrangement, it becomes possible to observe how much of aggregate income is received by similar proportions of households and how these proportions have changed over time. Table 1 presents the shares of aggregate income received by each fifth, or quintile, of the household income distribution for the entire 1967–93 period. The Gini index of income concentration, a summary measure of income inequality, is also presented.[11]

Generally speaking, the table shows that from the end of the 1960's to the end of the 1980's, the share of income going to the households in the highest quintile increased, while the shares going to the lower quintiles declined or changed very little. The dividing line between the top of the fourth quintile and the bottom of the fifth increased from $47,136 (in 1993 dollars) in 1967 to $60,280 in 1993.

The Gini indexes indicate that the long-run trend toward greater income inequality did not occur smoothly over the 1967–93 period. Indeed, as shown in chart 1, the trend was very gradual from 1967 to 1979. Between 1979 and 1989, however, the index grew rapidly—from .404 to .431—after which it slowed, ending at .433 in 1992.[12]

The slowing growth of household income inequality was no doubt related to the winding down of the economic expansion of the 1980's and the ensuing recession in the early 1990's. This slowdown received little attention in the media and in the research community, but developments during the period can help one gain an understanding of the apparent surge in inequality between 1992 and 1993.

Table 2 presents real mean household incomes for each quintile (as well as households in the top ventile) of the income distribution for the years 1979, 1989, 1991, 1992, and 1993, as well as the annual rates of change between each succeeding pair of years. Chart 3 displays the annual rates of change. The statistical cause of the rise in inequality in the 1980's can be seen quite easily: mean household incomes for the richest 20 percent of households were increasing by 1.7 percent a year, compared with a 0.4-percent increase for the poorest 20 percent.

The situation in the 1989–91 period stands out in stark contrast to that in 1979–89. During 1989–91, mean household incomes plummeted, not only for the lowest quintile, but also for those quintiles in the middle and at the top of the distribution. The mean household income in the highest ventile slid by almost 5 percent a year. The impact of corporate downsizing and restructuring was particularly severe among white-collar workers.[13] Ironically, the collapse of incomes across the distribution in this period halted the rise in income inequality.[14] (See chart 1.)

By 1992, the economy was slowly beginning to recover from the recession. Mean household income remained virtually unchanged between 1991 and 1992, but not for all households in the distribution. In particular, mean incomes of households in the bottom three quintiles continued to decline, while those of the top 5 percent continued to grow (although the increase was not statistically significant). This difference in income growth, however, helped push the Gini index up from .428 to .433, and although it was not a statistically significant change, it perhaps was a signal of things to come.

The change in inequality in the 1992–93 period is considerably more difficult to interpret, because of the aforementioned technical changes in the CPS. Some of the effects of the changes, however, are quantifiable and are presented in table 1. With respect to the reweighting of estimates as a result of the 1990 decennial census, the impact on measuring inequality was minimal. As shown in the table, the 1992 income shares and Gini indexes have been calculated using both 1980 and 1990 population weights. Shares were unaffected in 1992, and the Gini index was only slightly different (rising from .433 to .434, but not a statistically significant change).

Increasing the upper limits, or top codes, in 1993, however, had a significant impact both on the Gini index and on the shares of aggregate income received by various quintiles of the distribution, as can be seen in the table. If the new top codes had been used, the Gini index for 1993 would have been .454 instead of .447—.020 point higher than the 1992 Gini, instead of .013 point higher. Using comparable top codes between 1992 and 1993, however, preserved some analytical comparability between years.

Table 2. Mean income of each fifth and top 5 percent of the household income distribution, 1979, 1989, 1991, 1992, and 1993

[In 1993 dollars]

Year	Lowest fifth	Second fifth	Third fifth	Fourth fifth	Highest fifth	Top 5 percent
1979	$7,823	$19,457	$32,079	$47,076	$84,484	$128,847
1989	8,182	20,278	33,707	50,986	99,669	161,030
1991	7,706	19,255	31,984	48,758	93,501	145,913
1992[1]	7,547	18,828	31,716	48,649	94,233	149,592
1992[2]	7,506	18,725	31,548	48,429	93,837	148,937
1993[3]	7,411	18,647	31,260	48,572	98,589	163,228
Annual rate of change (percent):[4]						
1979–89	0.4	0.4	0.5	0.8	1.7	2.2
1989–91	-3.0	-2.6	-2.6	-2.2	-3.2	-4.9
1991–92[5]	-2.1	-2.2	-.8	-.2	.8	2.5
1992–93	-1.3	-.4	-.9	.3	5.1	9.6

[1] Survey weights derived from 1980 population census.

[2] Survey weights derived from 1990 population census.

[3] Introduction of CASIC; upper limits in 1993 are the same as in 1992.

[4] Compounded.

[5] Change based on income data using 1980 weights.

Chart 3 and table 2 show the percent changes in mean household incomes across quintiles (and in the top ventile) for the 1992 and 1993 distributions, both of which are weighted according to 1990 population controls, and both of which use the upper income limits of 1992. Incomes in the top ventile rose from $149,000 to $163,000, or almost 10 percent. The highest quintile's mean income increased by 5.1 percent, from $94,000 to almost $99,000. In contrast to the further declines in mean incomes in the bottom and third quintiles, these very sizable increases pushed inequality up, as measured by Gini index, by the largest amount for 1 year since the statistical series on household income inequality began.

The question, of course, remains: even after controlling for changes in the weighting of the income data and for top coding between 1992 and 1993, how much of the increase was due to the new mode of data collection (CASIC), and how much was due to changes taking place in the economy?

Survey changes or economic changes?

Attempts to quantify or decompose the effects of various factors on changes in survey data are a common exercise among economists and other researchers. Several statistical procedures are available for estimating such effects. In the case of

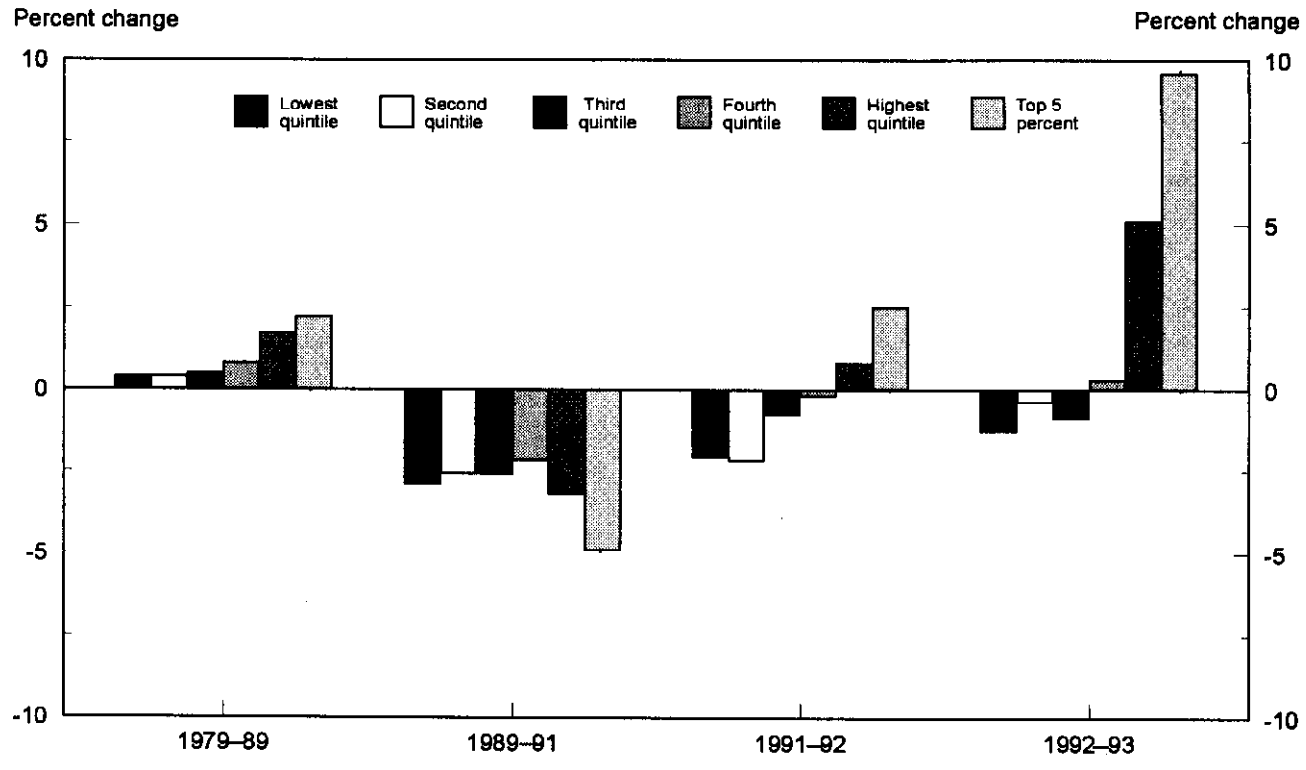
the apparent surge in income inequality between 1992 and 1993, however, the potential source of the change arises not only from factors outside the survey (that is, the economy), but also from factors inside the survey (for example, the data collection methodology). Untangling these potential effects, therefore, is even more challenging and, for the purposes of this article, will consist simply of drawing inferences from evidence relating to changes in the quality of the data and evidence relating to changes in the nature of job growth.

Changes in the quality of the data. Because the redesign of the monthly CPS was so extensive, the Census Bureau and the Bureau of Labor Statistics went to great lengths to assess the impact of the changes on the monthly estimates of employment and unemployment.[15] The results of their evaluation suggested that the national unemployment rate would be 0.5 percentage point higher in 1993 based on a parallel survey using the new questionnaire and technology than it actually was using the old questionnaire and collection methods.[16] Since that time, however, BLS has reexamined the effects of the changes and found them to be less (0.2 percentage point), but the Agency continues to warn data users about the possible effects of the changes on the estimates.[17] The assessment of CASIC's impact on the income data collected in the March 1994 CPS Annual Demographic Supplement, on the other hand, was much more limited, because only the mode of collection had been changed.[18] Basically, aspects of data quality were examined.

One of the most important reasons for computer-assisted interviewing is to simplify the job of the interviewer. The computer automatically brings the appropriate questions to the screen, it can be programmed to perform editing functions and identify inconsistent answers, and it has the ability to store and display data from earlier interviews. With these advantages, however, come certain disadvantages, such as a breakdown or malfunction of the computer, interviewer errors in recording responses, and, in those households in which a laptop computer was used in the home, the possible inhibiting influence on respondents of the computer's presence.

In reviewing the income data that were collected in March 1994, it was observed that certain income estimates were significantly lower than the previous year's estimates. Further review found that an unusually large number of subannual (that

Chart 3. **Annual rates of change in real mean household income, by quintiles and top 5 percent, 1979–89, 1989–91, 1991–92, and 1992–93**



NOTE: Annual rates of change for 1979–89 and 1989–91 are average annual rates; 1992–93 changes are based on 1990 weights.

is, weekly or monthly) income amounts were being recorded. Lack of familiarity with the new technology on the part of the interviewers was the suspected cause of the problem. To correct for those income recipients with unusually low amounts, reinterviews were conducted in August 1994, and the incorrect amounts were adjusted.[19] Other than this finding, the evidence with respect to the quality of the data was inconclusive. The Census Bureau, however, warned users that the data from the March 1994 CPS would "not [be] strictly comparable to [data from] earlier years."[20]

Another aspect of the quality of the data that has been examined involves the imputation of information on income that occurs because a response to a question about income was not forthcoming. Table 3 presents information on this issue. For persons with earnings (wages and salaries, or income from self-employment, or both) from their longest job or business in 1992 and 1993, the table shows the proportions that (1) actually reported their earnings from their longest job or business, or (2) had only their earnings from their longest job or business imputed, using the Census Bureau's "hot deck" procedure, or (3) had all information on them imputed in the Annual Demographic Supplement, including earnings from their longest job or business.[21] These proportions are displayed by broad earnings classes to see whether differential effects were evident.

For many households, of course, the earnings of persons from their longest jobs or businesses represents the largest part of household income and should be a fairly good indicator of the quality of the household income data. Table 3 shows that there was a slight overall decline from 1992 to 1993 in the proportion of individuals who actually reported their earnings to Census Bureau interviewers—from 79.6 percent to 77.7 percent. By earnings classes, changes in the proportions of persons who actually reported their earnings were statistically significant, with the lone exception of those with earnings of $75,000 or more.

A significant increase took place from 1992 to 1993 in the proportion of persons who had only their earnings from the longest job or business imputed—from 9.3 percent to 12.8 percent. However, all earnings classes experienced significant increases in imputations by item. High earners—those with earnings of $100,000 a year or more—had a higher rate of imputation by item than did any of the other earnings groups—17.4 percent.

The proportion of earners who had all their work experience and income information imputed declined from 11.1 percent in 1992 to 9.5 percent in 1993. The improvements were statistically significant in the earnings classes below $50,000 and between $75,000 and $99,999. The lowering of this rate is probably the result of the smoother transition between the monthly portion of the CPS and the supplemental questions as a result of CASIC.

Reaching any firm conclusion about the impact of CASIC on the quality of the income data after examining these estimates is difficult because the evidence is mixed: imputations by item increased, but overall imputations declined. In addition, the fact that there was no discernible pattern across earnings classes lends further support to the notion that CASIC's impact on the income data was inconclusive.

Changes in the nature of job growth. Research into the causes of rising inequality of incomes among households in recent years has generally focused on changes taking place in the Nation's economy—specifically, changes in the wage distribution. This is because labor market earnings represent such a large part of aggregate household income.

As has been well documented, the wage distribution has grown more unequal over time, just as the income distribution has. Shifts in labor demand toward more highly skilled and well-educated workers within industries and away from workers with relatively poorer skill endowments are thought to be responsible for this development.[22] Technological changes in the production of goods and services that are "skill biased" are thought to underlie these shifts.

The impact of this economic development on growing income inequality has been compounded by societal changes in living arrangements. The well-known rise in single-parent households over the last couple of decades has increased income dispersion because single-parent households tend to have much lower incomes than married-couple households do.[23] In addition, to the extent that growing proportions of men and women with similar skill profiles, and therefore

Table 3. Percent of persons with earnings from longest job or business whose earnings were actually reported, item imputed, or totally imputed, by earnings, 1992 and 1993

Earnings	Reported		Item imputed		Totally imputed	
	1992	1993	1992	1993	1992	1993
Total	79.6	77.7	9.3	12.8	11.1	9.5
Less than $25,000	79.5	77.0	9.2	13.3	11.3	9.7
$25,000 to $49,999	80.3	79.7	8.9	11.3	10.7	9.0
$50,000 to $74,999	79.6	78.1	10.0	12.3	10.4	9.6
$75,000 to $99,999	75.5	76.0	11.2	14.9	13.3	9.2
$100,000 or more	73.2	70.8	14.3	17.4	12.4	11.8

NOTE: Estimates are based on weighted counts of earners in 1992 and 1993; weights are derived from 1990 population census.

Table 4. Percent distribution of persons with work experience, by hourly earnings and household income, 1979 and 1993

Hourly earnings	Total	Less than $14,000	$14,000 to $27,999	$28,000 to $41,999	$42,000 to $55,999	$56,000 or more
1979 (in 1993 dollars)						
Total	100.0	7.2	17.7	22.0	19.8	33.2
Less than $7.00	31.0	5.6	7.6	6.3	4.5	7.0
$7.00 to $13.99	38.5	1.3	9.0	9.9	7.9	10.3
$14.00 to $20.99	18.7	.2	.7	5.2	5.2	7.4
$21.00 to $27.99	6.7	.1	.2	.3	1.9	4.2
$28.00 or more	5.1	.2	.2	.2	.3	4.4
1993						
Total	100.0	8.1	18.3	20.4	17.3	35.8
Less than $7.00	32.9	6.7	9.2	6.8	4.0	6.3
$7.00 to $13.99	36.7	1.1	8.3	9.3	7.6	10.0
$14.00 to $20.99	17.5	.2	.6	3.6	4.0	9.1
$21.00 to $27.99	6.8	.1	.1	.3	1.2	5.1
$28.00 or more	6.1	.1	.2	.3	.3	5.3

NOTE: Due to rounding, totals may not equal sums of individual items.

earnings, tend to marry and work, they also produce dispersion in the income distribution.[24] By themselves, however, changes in living arrangements occur only over long periods of time and were not likely to have any appreciable effect on the apparent surge in income inequality between 1992 and 1993.[25] Rather, most of the surge is likely to be related to changes in the nature of the employment growth that occurred during the period.

Some perspective on the nature of employment growth between 1992 and 1993 can be obtained by comparing that growth with what happened in the 1979–89 and 1989–92 periods. Table 4 shows the distribution of persons with some work experience in 1979 and 1993, cross-classified by their average hourly earnings and the annual income of the household in which they lived.[26] The table relates to *all* workers—from those who worked only a few weeks at part-time jobs to those who worked year round at full-time jobs. The data can be summarized by focusing on three broad groups accounting for approximately 75 percent of all persons with work experience in both years:

- Persons with hourly earnings of less than $7 and household incomes of less than $42,000 a year
- Persons with hourly earnings between $7 and $27.99 and annual household incomes between $14,000 and $56,000
- Persons with hourly earnings of more than $14 and yearly household incomes of $56,000 or more.

As is known, both earnings and income inequality rose between 1979 and 1993, and the changes in the proportions of persons in these groups help to explain why. Low-earning workers from households with incomes of less than $42,000 a year increased from 19.5 percent to 22.7 percent of all workers, those with midlevel earnings and income declined from 39.1 percent to 34.3 percent of the total, and those with hourly earnings from the middle to high range who lived in high-income households increased from 16.0 percent to 19.5 percent of all workers. In other words, the table shows the much-talked-about shift of middle-earnings employment away from middle-income households to low-income households and especially high-income households. (It is interesting to note that about 10 percent of all workers earned less than $7 an hour, but were from households with incomes of $42,000 a year or more.)

Table 5 presents the average annual changes that occurred in these broad earnings-income groups from 1979 to 1989, 1989 to 1992, and 1992 to 1993. The table shows that between 1979 and 1989 employment was growing rapidly—by 1.8 million persons a year. Much of the increase in average annual employment was taking place among persons with middle to high earnings who lived in high-income households. Employment in this earnings-income category was rising, on average, by about 921,000 persons a year during the 1980's. Employment was also growing, however, at the other end of the earnings-income distribution. The employment of workers with low hourly earnings who were from households with incomes of less than $42,000 a year increased by about 494,000 persons per year. But among workers with middle-level earnings who were from middle-income households, employment growth was meager at best—35,000 persons a year. The following tabulation presents Gini indexes for earnings alone for selected years from 1979 to 1993 (the figures in parentheses are the years of population censuses from which the survey weights for the given years are derived):

Year	*Gini index*
1979 (1980)	.385
1989 (1980)	.428
1992 (1980)	.414
1992 (1990)	.414
1993 (1990)	.449

Table 5. Annual average net change in persons with work experience, by hourly earnings and household income, 1979–89, 1989–92, and 1992–93

[In thousands]

Hourly earnings	Total	Less than $14,000	$14,000 to $27,999	$28,000 to $41,999	$42,000 to $55,999	$56,000 or more
1979–89						
Total	1,756	116	187	132	74	1,248
Less than $7.00	602	152	217	125	39	68
$7.00 to $13.99	361	–28	–9	58	82	258
$14.00 to $20.99	340	–6	–16	–46	–22	433
$21.00 to $27.99	201	0	–3	–2	–26	232
$28.00 or more	252	–3	–2	–1	1	256
1989–92						
Total	310	465	663	120	168	–1,106
Less than $7.00	603	381	296	140	71	–284
$7.00 to $13.99	366	56	291	77	182	–241
$14.00 to $20.99	–212	15	56	–113	4	–174
$21.00 to $27.99	–203	–2	2	9	–99	–112
$28.00 or more	–244	15	18	8	10	–295
1992–93						
Total	1,459	–21	290	545	–721	1,366
Less than $7.00	421	–189	380	120	–425	530
$7.00 to $13.99	510	86	–77	699	–85	–113
$14.00 to $20.99	–424	38	–45	–316	–299	199
$21.00 to $27.99	246	23	0	–25	25	222
$28.00 or more	706	16	33	66	63	528

NOTE: Data for 1992 and 1993 use survey weights from the 1990 population census. Due to rounding, totals may not equal sums of individual items.

During the 1979–89 period, the Gini index based on these workers' earnings distributions increased from .385 to .428, reflecting the foregoing annual average net changes in employment.

Table 5 also presents data for the recession that took place between 1989 and 1992. The annual average net change in employment during that period was much less than that of the previous period—only 310,000 persons a year—and there were noticeable differences in where employment was growing. Employment declined, on average, by 581,000 persons for those with middle to high earnings who were from high-income households. This decline reflected not only the loss of many high-paying blue-collar jobs as a result of the recession, but also a reduction in employment of high-paying white-collar jobs.

In contrast, employment gains were recorded among low-earning workers in low- to middle-income households (817,000 per year) and workers in the middle of the earnings and income distribution (342,000). These net changes actually produced a decline in earnings inequality: the Gini index was .428 in 1989 and .414 in 1992.

The 1992–93 period represented a return to the pattern of employment growth of the 1980's, but in a more extreme way. Table 5 shows that the employment growth of persons with middle to high earnings who were from high-income households rose by 949,000 during that period. At the same time, however, there was only modest employment growth among persons with low earnings who were from low- to middle-income households—about 317,000 persons. And, as in the 1980's, persons in the middle earnings and income group experienced no employment growth. (The group actually lost 53,000 workers.) The Gini index for these workers' earnings distributions shot up from .414 to .449 between 1992 and 1993, and although 1-year changes should obviously be viewed with caution, it is clear that this development was reflected in the apparent surge in income inequality.

According to these data, then, the pattern of employment growth in the 1992–93 period represented not only a return to the pattern seen in the 1980's, but an *exaggeration* of that pattern. While the ratio of employment growth at the top end of the distribution to that at the bottom end averaged about 1.86 to 1 in the 1980's, in the 1992–93 period it was 2.99 to 1. This development may have been the result of the combined effect of the return to the work force of many highly paid workers who were laid off in the early 1990's along with the resumption of the secular trend toward job creation at both ends of the wage distribution with little growth in the middle.

Conclusions

The result of efforts to improve the quality of economic data oftentimes is like a two-edged sword: on the one hand, the data are improved, but on the other, the comparability of the improved data with previously collected data comes into question. Such is the situation confronting those examining the change in income inequality between 1992 and 1993.

This article has discussed, in an inferential way, one possible interpretation of the change. It does appear that the reported surge in income inequality was driven by an unusually large increase in incomes in the highest quintile of the distribution—especially the top 5 percent of households.[27] An examination of the effects of the introduction of CASIC on the data showed that incomes of a certain number of households had been misrecorded, but that this misrecording affected only households in much lower income ranges. Imputation rates also were examined, especially at the high end of the distribution, but the changes there did not indicate any greater inclination on the part of high earners to report their earnings. For those who did report, however, it was apparent that considerably greater earnings were being reported, given the overall increase in incomes at the top end of the distribution. Whether or not the use of the computer in the survey process caused those who reported their earnings and incomes to be more forthcoming than usual is, unfortunately, a difficult hypothesis to test.

Evidence was shown that the increase in inequality could have been induced by changes taking place in the nature of employment growth as the economy moved out of the recession. Very strong employment gains were registered among persons with middle to high earnings who lived in high-income households. With the return to work at full capacity of many highly paid white-collar workers caught in the recession of the early 1990's, and with the resumption of the "two-tiered" employment growth characteristic of the 1980's, the forces for greater income inequality may have been particularly strong between 1992 and 1993. It remains for us to await the data from the March 1995 CPS to obtain more evidence on how to apportion the 1992–93 changes in household income inequality between changes in survey techniques and changes in the nature of employment growth. □

Footnotes

[1] See "Census Bureau Announces Number of Americans in Poverty Up for a Fourth Year although Poverty Rate Unchanged; Household Income and Health Care Coverage Drop," *United States Department of Commerce News*, CB94–159 (Bureau of the Census, Oct. 6, 1994). See also Daniel H. Weinberg, press briefing statement on the 1993 income and poverty estimates (Bureau of the Census, Oct. 6, 1994).

[2] See Paul Krugman, "Long-Term Riches, Short-Term Pain," *The New York Times*, Sept. 25, 1994, p. F9.

[3] The Gini index is a bounded measure of income inequality that ranges from 0 (all households receive the same share of aggregate income) to 1 (one household receives all income). There are many other measures of inequality, such as the ratio of incomes of households at the 90th percentile of the distribution to those of households at the 10th percentile, the variance of the logarithms of incomes, the coefficient of variation, the Theil index, and so on. While all of these measures are constructed differently and have different properties, each has indicated a growing dispersion in household income distribution in recent years.

[4] See Weinberg's press briefing statement, p. 5.

[5] See "Nature of Employment Growth Examined by BLS," NEWS, USDL 94–410 (Bureau of Labor Statistics, Aug. 24, 1994), p. 2.

[6] See "Money Income of Households, Families, and Persons in the United States: 1992," *Current Population Reports, Consumer Income*, Series P60–184 (Bureau of the Census, September 1993), p. C–12.

[7] See Rudy Fichtenbaum and Hushang Shahidi, "Truncation Bias and the Measurement of Income Inequality," *Journal of Business and Economic Statistics*, vol. 6, no. 3, July 1988, pp. 335–37.

[8] For a further discussion of these changes, see "Money Income of Households, Families, and Persons: 1993," *Current Population Reports, Consumer Income*, Series P60–188 (Bureau of the Census, forthcoming).

[9] Other top codes that were increased were earnings from all other jobs or businesses (from $99,999 to $999,999), income from Social Security (from $29,999 to $49,999), Supplemental Security Income (from $9,999 to $24,999), public assistance (from $19,999 to $24,999), and veteran's benefits (from $29,999 to $99,999). Top codes appearing in CPS public-use data files, however, were not changed and are lower than pre-1993 top codes. For example, the top code on the public-use file for earnings from the longest job or business is $99,999.

[10] All income data in this article have been adjusted for inflation using the BLS experimental consumer price index for all urban consumers, abbreviated CPI-U-X1.

[11] Two facts about the measurement of income inequality should be mentioned in this context. First, all measures of inequality have certain limitations embodied in them. The Gini index, which is a summary measure, can obscure the location in the income distribution where changes are occurring. A conceptually more difficult problem occurs when Lorenz curves, from which the Gini index is derived, cross. Lorenz curves show the relationship between the cumulative percentage of aggregate income and the cumulative percentage of recipients, and when the curves intersect for different years (or countries, groups, and so forth), a condition of Lorenz dominance prevails that makes it impossible to determine which distribution of income is more unequal.

Second, researchers who study income inequality and who focus more directly on the welfare implications of their findings customarily adjust the household or family income data for differences in the number of household or family members because of presumed economies of scale. No such adjustments were made to the data reported by the Census Bureau, nor were they made to the data used in this article; and even if they were made, they would not substantively change the findings presented.

[12] Actually, the slowdown began in 1987. The change in the Gini index between 1987 and 1989 was not statistically significant, nor was the change between 1989 and 1992. Changes in estimates are statistically significant unless otherwise stated.

[13] See Joseph Meisenheimer II, Earl Mellor, and Leo Rydzewski, "Job market slid in early 1991, then struggled to find footing," *Monthly Labor Review*, February 1992, pp. 3–17, especially p. 14; and Jennifer M. Gardner, "The 1990–91 recession: how bad was the labor market?" *Monthly Labor Review*, June 1994, pp. 3–11.

[14] Income growth patterns in the five quintiles during the 1987–88 and 1988–89 periods were also more uniform than in the 1979–87 period, and income inequality was virtually unchanged in the first two periods.

[15] For a discussion of the two Agencies' evaluation plan, see Chester E. Bowie, Lawrence S. Cahoon, and Elizabeth A. Martin, "Overhauling the Current Population Survey: Evaluating changes in the estimates," *Monthly Labor Review*, September 1993, pp. 29–33.

[16] See Sharon R. Cohany, Anne E. Polivka, and Jennifer M. Rothgeb, "Revisions in the Current Population Survey Effective January 1994," *Employment and Earnings* (Bureau of Labor Statistics, February 1994), pp. 13–37.

[17] See "Statement of Katharine G. Abraham, Commissioner, Bureau of Labor Statistics, before the Joint Economic Committee, United States Congress," Dec. 2, 1994, p. 4.

[18] "Money Income: 1993."

[19] A total 5,422 cases were targeted for reinterview, and 3,634 of those were completed. A proportion of the cases that were targeted but not reinterviewed had their income amounts adjusted on the basis of likelihood functions derived from completed reinterviews. See "Money Income: 1993."

[20] "Money Income: 1993."

[21] For a discussion of the "hot deck" method of imputation and recent changes to it, see Edward J. Welniak, Jr., "Effects of the March Current Population Survey's New Processing System on Estimates of Income and Poverty," paper presented before the 1990 meeting of the American Statistical Association, Anaheim, California, Aug. 2, 1990.

[22] See Lawrence F. Katz and Kevin M. Murphy, "Changes in Relative Wages, 1963–1987: Supply and Demand Factors," *Quarterly Journal of Economics*, February 1992, pp. 35–78; and John Bound and George Johnson, "Changes in the Structure of Wages in the 1980's: An Evaluation of Alternative Explanations," *American Economic Review*, June 1992, pp. 371–92.

[23] See, for example, Lynn Karoly, "The Trend in Inequality among Families, Individuals, and Workers in the United States: A Twenty-Five Year Perspective," in Sheldon Danziger and Peter Gottschalk, eds., *Uneven Tides: Rising Inequality in the 1980s* (New York, Russel Sage Foundation, 1993); and Paul Ryscavage, Gordon Green, and Edward Welniak, "The Impact of Demographic, Social, and Economic Changes on the Distribution of Income," in *Studies in the Distribution of Income, Current Population Reports, Consumer Income*, P60–183 (Bureau of the Census, October 1992).

[24] See Lynn A. Karoly and Gary Burtless, "The Effects of Rising Earnings Inequality on the Distribution of U.S. Income," Dec. 20, 1993 (mimeograph).

[25] It is interesting to note that, while the proportion of all *households* that were maintained by single parents was 15.7 percent in 1992 and 15.8 percent in 1993, the proportion of all *families* in which a wife was in the paid labor force increased from 46.0 percent to 47.0 percent.

[26] Average hourly earnings were obtained by dividing the annual earnings (wages and salaries, as well as self-employment income) of those workers by the product of the number of weeks and the usual number of hours per week they worked. Although this technique for estimating annual hours is crude because it involves usual, and not actual, hours worked (as well as having other problems), the resulting estimates are sufficiently reliable for the purpose of the intended comparison. The 1979 data are weighted according to 1980 weights, and the 1993 data are weighted according to 1990 weights.

[27] According to early estimates from the Internal Revenue Service for 1993, the number of tax returns with adjusted gross incomes of $100,000 or more was 3,557,000. This was 7.4 percent more than the figure for 1992 (3,312,000). The number of returns increased by 0.4 percent. (See *SOI Bulletin*, vol. 14, no. 2 (Internal Revenue Service, Fall 1994), p. 20; and *SOI Bulletin*, vol. 13, no. 2 (Internal Revenue Service, Fall 1993), p. 24.

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