Using the P90/P10 Ratio to Measure Inequality Trends with the Current Population Survey: A View from Inside the Census Bureau Vaults

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Abstract

Using public use and internal March Current Population Survey (CPS) data, we show that even using a P90/P10 ratio with public use CPS data does not completely avoid time-inconsistency problems, especially for those interested in trends in household income inequality. Using internal CPS data, we create consistent cell mean values for all top-coded public use CPS values that when used with public use data closely track inequality trends in labor earnings and household income using internal CPS data. However we also show that estimates of long-term inequality trends with these corrected data are not robust across alternative measures of inequality.

Introduction

The vast majority of research on trends in United States labor earnings and income inequality since the 1970s has been based on public use files of the March Current Population Survey (CPS). Yet time-inconsistency problems related to top coding in these data have led many researchers to use the ratio of the 90th and 10th percentile of these distributions (P90/P10) rather than a more traditional summary measure of inequality such as the Gini index, Theil index, or coefficient of variation, each of which uses information about all income values, rather than only two. In the United States labor economics literature the P90/P10 ratio is the most commonly used measure of wage or labor earnings dispersion: see e.g. Juhn, Murphy and Pierce (1993), Danziger and Gottschalk (1993), DiNardo, Fortin, and Lemieux (1996), Gottschalk and Smeeding (1997), Gottschalk and Joyce (1998), Katz and Autor (1999), Autor, Katz and Kearney (2005), Blau and Kahn (2005), Lemieux (2006) and Pencavel (2006). In the United States income inequality literature, the P90/P10 ratio of individual's size-adjusted family or household income is also a standard measure of income inequality: see e.g. Danziger and Gottschalk (1993), Gottschalk and Smeeding (1997), Gottschalk and Danziger (2005), and Daly and Valletta (2006).

Other things being equal, any of the traditional summary measures of inequality are likely to be better measures of inequality of the entire distribution, and hence of its trends over time, than the P90/P10 measure which only captures two points in that distribution. But other things are often not equal. The public use March CPS is the best source of annual information on trends in the labor earnings and income of United States households available to the research community. However, all sources of income in the public use CPS are top coded, which makes accurate calculations of traditional summary measures of the distribution impossible and comparisons of these values over time difficult (Levy and Murnane, 1992; Gottschalk and Smeeding, 1997). Moreover, even the internal CPS data, which are not subject to top coding, have been censored to various degrees over time (Welniak, 2003).

Past research has documented the impact of censoring on Gini coefficients estimated with both the public use and internal CPS data (Burkhauser et al. 2004; Feng et al. 2006). But no similar scrutiny has been given to the impact of censoring on percentile ratios such as the P90/P10. Researchers have implicitly assumed that the P90/P10 ratio is not affected by censoring, since the number of cases of censoring of total wages and salaries, labor earnings or income is less than 10 percent. While this is true, in the CPS data, censoring takes place at the level of each income source not at these total levels, so some values of those below the 90^{th} percentile of total labor earnings and especially the 90^{th} income percentile are censored. As a result, even what appear to be modest amounts of censoring in the data may cause P90/P10 ratios to be affected.

After undergoing a process established by the U.S. Census Bureau, two of us became Special Sworn Status researchers of the U.S. Census Bureau at the New York Census Research Data Center at Cornell in 2005. By agreeing to the terms of this process we have been able, for the first time, to gain access to some of the internal March CPS data for the purpose of examining the severity of censoring in both the internal and public use CPS data and to make suggestions to the Census Bureau with respect to overcoming such problems.

We do so here for income years 1975–2000. We examine three sources of income evaluated in the labor and income inequality literatures: wages and salaries for full-time, full-year workers; total earnings for full-time, full-year workers (wage and salaries plus farm and non-farm self-employment earnings); and household income. Table 1 provides the exact

Census Bureau file names and definitions of these three sources of income and how they have changed over time.

We show that using a P90/P10 ratio with public use CPS data, even when Census Bureau cell means are used for top coded values, does not completely avoid the problem of time-inconsistency, especially for those interested in trends in the inequality of household income. However because we had access to the internal CPS data, we were able to create consistent cell mean values for all top-coded values in all years of internal CPS data made available to us—1975–2000—that, when integrated into the public use CPS data, offer a plausible correction for time inconsistency problems in the public use CPS data. However, when we estimate long term inequality trends from our P90/P10 and Gini estimates using our adjusted public use CPS data, we show that the trends in the two measures are significantly different. Hence, researchers should be cautious in making inference about trends in the inequality of an entire distribution based on changes in the relative position of only two points in that distribution for all three of the income distributions we track over the last quarter of the 20th Century.

Data censoring problems in the Current Population Survey

The Current Population Survey (CPS), a large representative sample of the United States population, interviews about 57,000 households each month. Each March, the CPS collects detailed information on each source of income in the previous year for every household member. However, to protect the confidentiality of its households, top codes are imposed on all sources of income above a certain value. Less well known to the research community is the fact that even the internal data the Census Bureau uses to calculate various official statistics, including inequality measures, are also subject to censoring. In earlier years this was primarily because of tape space restrictions. Although substantially relaxed, CPS internal income data are still censored for various Census Bureau considerations, including minimizing the possible impact of recording (keying) errors, helping to maintain respondents' confidentiality, and preventing volatility and distortion of annual statistics (Welniak, 2003, Feng et al. 2006).

As can be seen in Table 1, for income years 1975–1986, the Census Bureau reported three sources of labor earnings and eight other sources of income. Since then, they have reported four sources of labor earnings and twenty other sources of income, reflecting a finer categorization of income. For all components, both the internal and public use CPS censoring points have changed over time. Appendix Table 1 provides public use CPS censoring points for income years 1975-1986 and Appendix Table 2 does so for 1987–2004. Corresponding internal CPS censoring points for these two periods are provided in Appendix Tables 3 and 4.[1]

Because censored values start at different points in the distribution each year, unadjusted inequality measures are time-inconsistent, including those published by the Census Bureau using internal CPS data. Past researchers have recognized this problem and, for the most part, used some rule of thumb adjustment procedures to control for it (e.g. Juhn et al., 1993 and Trejo, 1997). More recently, Burkhauser et al. (2004) consistently top coded values at the same point in the distribution (the highest common point in the distribution available for all years) and estimated Gini coefficients that while lower in level, captured the long-term trends in inequality relatively well. Feng et al. (2006) took a parametric approach and fitted a Generalized Beta of the Second Kind (GB2) model to the distribution of labor earnings of U.S. full-time, full-year workers. They argue that their estimated Gini values from the public use

[1] We only provide internal CPS censoring points to income year 2000 because at the time this paper was written, we did not have access to later years of data.

CPS better capture long-term trends in labor earnings for this population than even Census Bureau values based on uncorrected internal CPS data.

Below we examine the degree to which censoring remains a problem for those who use P90/P10 values estimated from the public use CPS data to capture trends in wage and salaries, labor earnings and size-adjusted household income inequality.

Methods

Let the true income distribution be denoted by the random variable x, which has a cumulative distribution function $F(x)$. The pth population income quantile ξ_p is defined by

$$p = F(\xi_p) = \Pr(x \leq \xi_p),\ 0 \leq p \leq 1. \tag{1}$$

Suppose we have a random sample s comprising N income units, with the distribution of their incomes described by the vector $\boldsymbol{x} = \{x_1, x_2, x_3, \ldots, x_N\}$. The sample estimate of the pth quantile of the distribution is

$$\hat{\xi}_p = \sup\{\, x_i \in s \mid \hat{F}(x_i) \leq p \,\}, \tag{2}$$

derived by solving the equation $p = \hat{F}(\xi_p)$, where the sample estimate of the cumulative distribution function for $\boldsymbol{x}$ is:

$$\hat{F}(x) = \Sigma_s\, w_i\, I(x_i \leq x) / \hat{N},\ \text{with}\ \hat{N} = \Sigma_s\, w_i. \tag{3}$$

$I(.)$ is the indicator function and the sample weight for unit $\boldsymbol{i}$ is w_i.

The problem for researchers is that $\boldsymbol{x}$ is not fully observed. Top coding (or right censoring in general) means that some incomes at the top of the income distribution are not observed. Instead, two other vectors are observed in the sample by researchers: censored incomes $\boldsymbol{y} = \{y_1, y_2, y_3, \ldots, y_N\}$ and censoring indicators $\boldsymbol{c} = \{c_1, c_2, c_3, \ldots, c_N\}$, with $y_i = x_i$ if $c_i = 0$ and $y_i < x_i$ if $c_i = 1$, for each $\boldsymbol{i} = 1, \ldots, N$. In addition, because we are trying to model incomes that are aggregates of several income sources, but censoring occurs at each individual income source level, some lower valued incomes might be censored while higher valued ones are not censored.

The sample estimate of the proportion of censored observations is $\hat{\theta}$ where:

$$\hat{\theta} = \Sigma_s w_i I(c_i = 1) / \hat{N} . \tag{4}$$

Lower and upper bound estimates

Although incomes values may be censored, we can place lower and upper bounds on the quantiles that we are trying to estimate. The lower bound is derived from distribution $\boldsymbol{y}$, assuming that the true (unobserved) value of each censored observation is equal to the observed censored value. The upper bound is derived by assuming that the true income value of each censored observation is equal to positive infinity, i.e. estimated from a distribution $\boldsymbol{z} = \{z_1, z_2, z_3, \ldots, z_N\}$, with $z_i = x_i$ if $c_i = 0$ and $z_i = +\infty$ if $c_i = 1$, for each $i = 1, \ldots, N$. In general, the ranking by income of units differs between distributions $\boldsymbol{y}$ and $\boldsymbol{z}$ and hence lower and upper bound estimates of the quantiles of the true distribution differ.

More formally, the estimate of the lower bound is.

$$\hat{\xi}_p^L = \sup\{ y_i \in s \mid \hat{F}_y(y_i) \le p \}, \tag{5}$$

where the empirical CDF of the censored distribution $\boldsymbol{y}$ is:

$$\hat{F}_y(y) = \Sigma_s w_i I(y_i \le y) / \hat{N} . \tag{6}$$

The estimate of the upper bound is

$$\hat{\xi}_p^U = \sup\{ z_i \in s \mid \hat{F}_z(z_i) \le p \}. \tag{7}$$

where the empirical CDF of the distribution $\boldsymbol{z}$ is:

$$\hat{F}_z(z) = \Sigma_s w_i I(z_i \le z) / \hat{N} . \tag{8}$$

It is straightforward to show that $\hat{\xi}_p^L \le \hat{\xi}_p \le \hat{\xi}_p^U$ for $0 \le p \le 1$, because $y_i \le x_i \le z_i$ for each $i = 1, \ldots, N$. Moreover, when $p \le 1 - \hat{\theta}$, both upper and lower bounds are informative. If, instead, $p > 1 - \hat{\theta}$, censoring bites: the *p*th quantile lies within the censored income range. In this case, the lower bound estimate of the *p*th quantile derived from $\mathbf{y}$ remains well-defined, but the upper bound estimate is uninformative — it is infinity.

To illustrate how the upper and lower bounds of order statistics such as quantiles are derived, we give a simple numerical example. Suppose the observed incomes are {2000, 1000, 4000, 5000} and the first of these is censored. Suppose the aim is to estimate the income corresponding to the second highest earner. Only one income is censored and so we have the case corresponding to $p \le 1 - \theta$. The lower bound estimate of the second highest income is 4000, and the upper bound estimate is 5000. Now suppose that income 4000 is also censored. This takes us to the case $p > 1 - \theta$. The lower bound estimate of the second highest income is again 4000, but the upper bound estimate is uninformative.

If the income for any unit is an aggregate of incomes across individuals belonging to the same unit (e.g. a household), the same estimation methods apply.

Using this method we calculate upper and lower bound P90/P10 ratios based on public CPS data files, which we will call the *Public-Upper* and *Public-Lower* CPS series respectively. Moreover, because we have access to the internal CPS data files, we are also able to calculate *Internal-Upper* and *Internal-Lower* CPS series of P90/P10 ratios from the internal CPS data in a similar way. Because internal CPS data contain more information than public use CPS data (i.e., the internal censoring point is greater than or equal to the public use censoring point), the Public-Upper CPS values will be higher than or equal to the Internal-

Upper CPS values and Public-Lower CPS values will be lower than or equal to the Internal-Lower CPS values.

We also calculate three other P90/P10 ratio series from the CPS for comparison purposes. The first, ***Public***, is calculated from public use CPS files using the top coded value assigned by the Census Bureau to the individuals' sources of income for all years. This series will be the same as ***Public-Lower*** values before income year 1995, but will be higher thereafter because beginning in income year 1995 the Census Bureau assigned an estimated cell mean to each top coded value based on the person's characteristics rather then the top code cutoff value. For these years, because the ***Public*** series provides a more accurate distribution of source values than the top coded cutoff value, they should yield P90/P10 values that are closer to the internal values.

The second, ***Cell-Mean***, assigns a cell-mean that we consistently calculate over all the years of internal CPS data available to us (1975-2000) for each person top coded. Because we were given permission to use the internal CPS data, we were able to construct a data file similar to the one discussed below that the Census Bureau has, since 1995, used to assign cell means to top coded values in the public use CPS. For the same reasons discussed above the P90/P10 values in this series should more closely track the internal CPS values in all years.

In income year 1995 the Census Bureau began providing cell mean values rather than the top coded cutoff value for wages and salaries, self-employment earnings, and farm earnings from sex/race/work experience cells. That is, rather than reporting the top code cutoff value, the public use CPS file reports the average value for those with the same sex/race/work experience characteristics with values above the top code cutoff point. In income year 1998, the Census Bureau extended its provision of cell means to other non-governmental sources of income. However, to date the Census Bureau has not provided cell means based on this methodology for earlier years. Hence for reasons of consistency, researchers interested in comparing trends in labor earnings or income before 1995 with those since 1995 are not able to take advantage of the cell mean option available in the public use CPS data. However, using our access to the internal CPS data, we were able to create a consistent set of cell mean values for each income source for every person for income years 1975-2000 in the public use CPS.[2]

The third, ***Rule of Thumb***, assigns a value of 150 percent of the top code cutoff value to all top coded values. This popular rule of thumb approach to assigning top code values has been used in the labor economics literature by Katz and Murphy (1992), Autor, Katz and Kearney (2005) and Lemieux (2006).

Trends in labor earnings inequality for full-time full-year workers

Table 2 reports P90/P10 ratio trends for the wages and salaries of full-time, full-year workers, the most typical category of workers and labor earnings used to trace labor earnings inequality in the labor literature, for our seven CPS data series discussed above. The first five columns are alternative measures of public use CPS data; although Column 5 is based on our cell means series that is not yet available to the public. The last two columns come from the internal CPS data. As we will see, while censoring is a potential problem in estimating trends in wage and salary income of this population, it is not a very important one, both because

[2] That is, for every income source we calculate a single mean value for all top coded values. But we do not provide cell-means for subcomponents of the population—i.e. sex, race, experience. In contrast, the Census Bureau provides cell means based on sex/race/work experience cells for labor earnings but only single cell means for non-governmental sources of non-labor incomes and they do not provide cell means at all for governmental sources of non-labor income. In addition, our series provides consistent cell-mean values for earlier years, something the Census Bureau has not provided to the research community yet.

there is no censoring problem in the internal data and only a small potential problem in the public use data.

Prior to income year 1987, wages and salaries income came from only one source (INCWAG): see Table 1. Hence top coding was not a problem since none of the workers with wage and salary top codes in these years were below the 90th percentile of wage and salary workers. Since then, at least in principle, the 90th percentile value could be affected by top coding since the Census Bureau began reporting wage and salary income from two sources, one primary (INCER) and one secondary (INCWG1). Hence it is possible that workers below the 90th percentile in the sum of these two categories could be top coded in one of them. As Columns 1 and 2 of Table 2 show, top coding is not a problem in any year prior to 1987 and is only a potential problem in five years since then,—1995, 1997, 1999, 2000 and 2002—where ***Public-Upper*** does not equal ***Public-Lower***. And in none of these years is the difference between these two values very great.

Columns 6 and 7 of Table 2 show that the internal CPS data provide accurate P90/P10 ratios for all years since the ***Internal Upper*** (column 6) values equal ***Internal-Lower*** values (Column 7) in all years. And as can be seen Columns 1 and 2 and 6 and 7 all have identical values in all the years prior to 1995 and in most years thereafter. Hence with respect to wage and salaries, the P90/P10 ratio values are relatively free of top coding problems. This is even more the case if one compares the internal values with the ***Public*** series values (column 3) which assigns cell means values to all top coded cutoff values beginning in 1995. Of the years where we can compare internal values with the ***Public*** series there are differences only in 1995 and 1997. But in these two, our ***Cell-Mean*** series (Column 5), if made available to public use CPS users, would match exactly the P90/P10 internal values. But as can be seen in

Column 4, the *Rule of Thumb* series, already available to the public, yields virtually the same P90/P10 ratio results as the internal series in these two years.

Table 3 reports P90/P10 ratio trends for individual earnings of full-time, full-year workers. Prior to income year 1987, the Census Bureau reported income from three different sources for this category: wages and salaries (INCWAG), self-employment earnings (INCSE), and farm earnings (INCFRM). Since then, four sources are reported: primary earnings (INCER), second wages and salaries (INCWG1), secondary self-employment earnings (INCSE1), and secondary farm earnings (INCFR1). As was the case in Table 2, censoring does not matter in any year prior to 1987 in the public use data (Columns 1 and 2) and for only a few years thereafter—1996, 1998, 1999, 2001, 2003, and 2004. And once again even in these years the possible range of difference is quite small. In the years that we have access to the internal files, censoring has not been a problem, with *Internal-Upper* equaling *Internal-Lower* in all years (Columns 6 and 7). As can be seen in Column 3 when Census Bureau provided cell means are used in the years where we have internal data, those values match the internal values except in 1998 and 1999. However, both the *Rule of Thumb* and our *Cell-Mean* series exactly match the internal values in all years.

Trends in household income inequality

Table 4 reports P90/P10 ratio trends in household size-adjusted income.[3] Because there are far more sources of household income than was the case for labor earnings, and because a household's income is the sum of the incomes of all of its members, we expected

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[3] To capture the economies of scale in terms of consumption for households, we adopt a commonly used procedure in the household income inequality literature to adjust for the size of the household, deflating incomes by a 'square root' equivalence scale. We suppose that $Y = X/M^{0.5}$, where X is unadjusted total household income, M is the number of individuals in the household, and Y is the adjusted household income. See Karoly and Burtless (1995) and Burkhauser et al. (2003-2004).

censoring to be a more serious problem in this literature than was the case for labor earnings. Prior to 1987, eleven sources of income were reported, and the number has increased to 24 since then (see Table 1). As Table 4 shows, the P90/P10 ratio in the public CPS files is affected by top coding problems, although prior to the 1990s, the gap between ***Public-Upper*** and ***Public-Lower*** is small. But the gap between these two values has risen steadily since then and especially since 1998. (See Figure 1 for a pictorial view of the trends in ***Public-Upper*** and ***Public-Lower***.)

Figure 2 provides a clue to the underlying source of the divergence between ***Public-Upper*** and ***Public-Lower***. It shows the percentages of households affected by top coding by income year. The top line of Figure 2 shows that the percentages of all households that were affected by top codes increased steadily in the early 1990s, declined a little in the middle 1990s, and then rose sharply after 1996. This is not a problem in itself as long as censoring only occurs for households above the 90th percentile. Thus in Figure 2 we investigate the percentage of individuals whose household size-adjusted income is affected by top coding below the 95th, 90th and 85th percentiles. As Figure 2 shows, households below the 90th percentile began to be affected by top coding in the early 1990s and have been more sharply impacted since 1998. Note that reducing the ratio to P85/P10 would reduce this problem somewhat but would not resolve it.

Figure 3 focuses on the post-1987 period and shows the percentage of top coded values by income source: primary labor earnings, other labor earnings, and all other income. As Figure 3 shows, the jump in the gap between ***Public-Upper*** and ***Public-Lower*** was primarily driven by the sharp increase in top coding of non-labor earnings, which rose from 0.1 percent in 1997 to 1.6 percent in 1998 and had increased to 2.4 percent by 2004. As can be seen in Appendix Table 2, in income year 1998 (corresponding to CPS survey year 1999), the CPS started to top code all non-governmental sources of non-labor income items, which resulted in substantial lowering of the censoring points in the public use files. For example, the censoring point for interest income was $99,999 in 1997, but only $35,000 in 1998.

Hence unlike the P90/P10 ratios from the internal use CPS, the public use CPS P90/P10 ratios have been substantially impacted by censoring problems and this is especially the case in recent years. But as Table 4 also shows, censoring problems are not confined to the public use CPS. As can be seen in Columns 6 and 7, *Internal-Upper* and *Internal-Lower* values are not the same in all years, although in most cases the difference is relatively small. Hence as can be best seen in Figure 1, when compared to the top coding problems in the public use CPS, the differences between *Internal-Upper* and *Internal-Lower* are quite small and practically negligible, relative to the differences between the *Public-Upper* and *Public-Lower* public use CPS values.

As Column 3 shows, the use of Census Bureau provided cell means does not solve the problems associated with censoring in the public use CPS. While these values fall within the range of the *Public-Upper* and *Public-Lower* values, they consistently fall above the range of the *Internal-Upper* and *Internal-Lower* values and of course are not provided for all years of the data. The *Rule of Thumb* also falls within the range of the *Public-Upper* and *Public-Lower* values but consistently falls below the range of the *Internal-Upper* and *Internal-Lower* values. The *Cell-Mean* values also fall within the range of the *Public-Upper* and *Public-Lower* values but always fall in the range of the *Internal-Upper* and *Internal-Lower* values. Hence it offers the best alternative for tracking the internal trends.

Comparing long-term trends in inequality using P90/P10 and Gini values

Researchers in the labor and income inequality literature frequently capture trends in inequality with the public use CPS data using P90/P10 ratios rather than with more traditional summary measures of inequality such as the Gini or Theil indices, or coefficient of variation, because of concerns about censoring in these data. We have shown that P90/P10 ratios are themselves subject to censoring problems, especially when used to measure income inequality. But we have also shown that by using a consistent set of cell means created from the internal CPS data one can estimate a P90/P10 ratio series that is quite close to the P90/P10 ratio series estimated with internal CPS data. The additional issue that we turn to now is whether the P90/P10 ratio provides a picture of inequality trends that is robust. Does it provide the same picture as a measure that uses information about all the incomes in the distribution rather than only two?

In this section we compare trends in inequality (of wage and salary income, labor earnings, and household size-adjusted income) derived from our ***Cell-Mean*** P90/P10 ratio series with trends derived from a Gini coefficient series based on public use CPS data. We use our ***Cell-Mean*** series for the P90/P10 both because it more closely replicates the internal series than any other data currently available to the general research community and because in principle it could be made available to the public. Feng et al. (2006) compare the GB2-estimated Gini for total earnings of full-time, full-year workers from public use CPS data with other alternatives, including the Census Bureau Gini coefficients based on uncorrected internal CPS data, and argue that the GB2 series best captures the long term inequality trend. Again we use this series because it both controls for censoring and is available to the general research community. This is the first time that series for the P90/P10 ratio and Gini inequality measures have been compared with both corrected for the problems of censoring.

To estimate the GB2 Gini series, we assume, following Feng et al. (2006), that incomes have a finite mixture distribution with a mass point at zero, and follow the GB2 distribution for positive income values.[4] Income is zero with probability h and greater than zero with probability 1–h. The Gini coefficient for the overall distribution is: $G = h + (1 - h)g$, where g is the Gini coefficient for positive incomes calculated from the GB2 parameters. The GB2 probability density function is (McDonald 1984):

$$f(x) = a x^{ap-1} \Big/ \left(b^{ap} B(p,q)(1 + (x/b)^a)^{p+q} \right), \; x > 0, \tag{8}$$

where $B(p, q)$ is the beta function. The formula for the Gini is

$$g = 2\int_0^{\infty} x[F(x) - 0.5]dF(x) \Big/ \int_0^{\infty} x dF(x), \tag{9}$$

The expression for the CDF in the GB2 case is given by McDonald (1984). Estimates of the GB2 parameters were derived by maximum likelihood, noting that the sample likelihood contribution, L_i, for each sample observation i with a positive income, is:

$$L_i = c_i \ln[\, 1 - F(x_i)\,] + (1 - c_i) \ln f(x_i). \tag{10}$$

We are interested in comparing the rates of increase for the two measures, and so both series are normalized using year 1975 as the base. Figure 4 depicts normalized Gini and P90/P10 ratio estimates for wages and salaries among full-time, full-year workers from 1975 to 2000. The two series differ substantially. Our Gini coefficients show a steady upward trend over the period while our P90/P10 ratios exhibit a much greater year to year fluctuation around a somewhat downward trend with a lower value in 2000 than in 1975. Taking the

[4] We follow the Census convention and convert negative values to zeros in our calculations.

P90/P10 ratio based trend at face value would imply that wage inequality didn't change much over this period. While it may be the case that the trends in these two percentiles did not change much over the period, inferring that this was necessarily the case for inequality as a whole would be inconsistent with our finding using Gini coefficient values that show the opposite to be the case.

Figure 5 follows the same methods as discussed in Figure 4 but does so for the total labor earnings of full-time, full-year workers. In this case, however, both series increase modestly between 1975 and 2000, although the P90/P10 ratio series suggests a slightly higher rate of increase and greater year to year fluctuations.

Figure 6 follows the same methods but does so for size-adjusted household income. Once again the P90/P10 ratio values suggest a higher increase in inequality, especially in the 1980s and early 1990s and much greater year to year fluctuations.

To more formally test differences in linear trends, we use a regression technique similar to Burkhauser et al. (2004) and Feng et al. (2006). In our equation below, the dependent variable (*y*) is the normalized inequality measure: Gini coefficient or P90/P10 ratio. There are six explanatory variables: a constant, which is the level of the P90/P10 ratio; a time trend *t* (= 1, 2, ... 26), the trend in the P90/P10 ratio; a source variable (***d*** = 1 if the dependent variable is the Gini, and 0 otherwise), which controls for the difference between levels in Gini and P90/P10; ***dt*** (***d*** and *t* interacted), which controls for the difference between the trends in the two inequality measures; a dummy variable that controls for whether the observation refer to the post-1992 period of not (***u*** = 1 if post-1992, and 0 otherwise) that we include to account for substantial changes in CPS collection procedures in that year (Feng et al., 2006); ***du*** (***d*** and *u* interacted) to control for differences in the post-1992 levels. The numbers in parentheses are *t*-values based on robust standard errors.

We first report results for wages and salaries of full-time full-year workers. The estimated equation is as follows:

Index =	0.993	– 0.0003 *t*	+ 0.027 *d*	+ 0.005 *dt*	– 0.040 *u*	+ 0.041 *du*
	(40)	(0.17)	(1.03)	(2.15)	(1.18)	(1.18)

The insignificant coefficient for *t* suggests that there is no overall trend in the P90/P10 ratio during the period 1975–2000. In contrast, the Gini coefficient shows a significantly different trend, as suggested by the interaction of *d* and *t*. There is no change in levels for either the Gini or P90/P10 ratio in the post-1992 period.

For total earnings of full-time full-year workers, the estimated equation is:

Index =	0.998	– 0.011 *t*	+ 0.011 *d*	+ 0.005 *dt*	– 0.003 *u*	+ 0.041 *du*
	(57)	(7.7)	(0.61)	(3.79)	(0.11)	(1.68)

For the whole period 1975–2000, the P90/P10 ratio shows a positive and significant linear trend, as suggested by the coefficient on *t*. Again, the Gini shows a different trend, suggested by the significance of *dt*, with a slower rate of increase. Nevertheless, there is still a positive trend for the Gini, as the F-test of the hypothesis that $t + dt = 0$ is rejected at the 1 percent level. Again, there is no change in levels for either the Gini or P90/P10 ratio for the post-1992 period.

For Index =	1.00	+ 0.018 *t*	– 0.018 *d*	– 0.012 *dt*	– 0.085 *u*	+ 0.102
	(42)	(9.15)	(0.71)	(5.95)	(2.17)	(2.56)

For the whole period, the P90/P10 ratio shows a positive and significant trend, as suggested by the coefficient of *t*. Again, the Gini values show a different trend, suggested by the significance of *dt*, with a slower rate of increase. Nevertheless, there is still a positive trend for the Gini, as the F-test of the hypothesis that $t + dt = 0$ is rejected at the 1 percent level. In terms of the post-1992 changes, the P90/P10 ratio shows a significant drop, as suggested by the coefficient on *u*, whereas for the Gini there appears to be a modest increase in inequality.

In all regressions, the Gini and P90/P10 ratio values show different time trends. Thus, researchers should be cautioned about using the relative position of two points in the U.S. distributions of wages and salaries, labor earnings or income to draw conclusions about how overall inequality of each of these income sources changed over the last quarter of the 20th Century. The choice of measure matters.

Conclusion

We investigate how P90/P10 ratios are affected by censoring when used to measure inequality in the distribution of wages and salaries, labor earnings and household income. We do so both with public use and internal CPS data. Top coding is less of a problem for wages and salaries and for labor earnings than for household income. In all cases, we found that the P90/P10 ratio values using top coded data with consistent cell means provides the best alternative to those calculated with internal CPS data which are not accessible to the public. We urge the Census Bureau to provide our cell mean series to the general research community or to develop and provide an alternative cell mean series for all years of the public use CPS data.

The P90/P10 ratio is only one measure of inequality. Our comparisons of corrected P90/P10 series and Gini coefficient series yield significantly different long term trends in wages and salaries, labor income, and household size-adjusted income for the period 1975–

2000. Hence researchers should be cautious about inferring long term trends in the inequality of these distributions on the basis of a single inequality measure.

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Table 1. Income Items Reported in the Current Population Survey

Name	Name in Public Files	Name in Internal Files	Definition
			1975–1986
Labor Earnings			
INCWAG	I51A	WSAL_VAL	Wages and Salaries
INCSE	I51B	SEMP_VAL	Self employment income
INCFRM	I51C	FRSE_VAL	Farm income
Other Sources			
INCSS	I52A	I52A_VAL	Income from Social Security and/or Railroad Retirement
INCSEC	I52B	SSI_VAL	Supplemental Security Income
INCPA	I53A	PAW_VAL	Public Assistance
INCINT	I53B	INT_VAL	Interest
INCDIV	I53C	I53C_VAL	Dividends, Rentals, Trust Income
INCOMP	I53D	I53D_VAL	Veteran's, unemployment, worker's compensation
INCRET	I53E	I53E_VAL	Pension Income
INCALC	I53F	I53F_VAL	Alimony, Child Support, Other income
			1987–2004
Labor Earnings			
INCER	ERN_VAL	ERN_VAL	Primary Earnings
INCWG1	WS_VAL	WS_VAL	Wages and Salaries-Second Source
INCSE1	SE_VAL	SE_VAL	Self employment income -Second Source
INCFR1	FRM_VAL	FRM_VAL	Farm income -Second Source
Other Sources			
INCSS	SS_VAL	SS_VAL	Social Security Income
INCSEC	SSI_VAL	SSI_VAL	Supplemental Security Income
INCPA	PAW_VAL	PAW_VAL	Public Assistance & Welfare Income
INCINT	INT_VAL	INT_VAL	Interest
INCDV2	DIV_VAL	DIV_VAL	Dividends
INCRNT	RNT_VAL	RNT_VAL	Rental income
INCALM	ALM_VAL	ALM_VAL	Alimony income
INCHLD	CSP_VAL	CSP_VAL	Child Support Income
INCUC	UC_VAL	UC_VAL	Unemployment income
INCWCP	WC_VAL	WC_VAL	Worker's compensation income
INCVET	VET_VAL	VET_VAL	Veteran's Benefits
INCRT1	RET_VAL1	RET_VAL1	Retirement income - source 1
INCRT2	RET_VAL2	RET_VAL2	Retirement income - source 2
INCSI1	SUR_VAL1	SUR_VAL1	Survivor's income - source 1
INCSI2	SUR_VAL2	SUR_VAL2	Survivor's income - source 2
INCDS1	DIS_VAL1	DIS_VAL1	Disability income - source 1
INCDS2	DIS_VAL2	DIS_VAL2	Disability income - source 2
INCED	ED_VAL	ED_VAL	Education assistance
INCONT	FIN_VAL	FIN_VAL	Financial Assistance
INCOTH	OI_VAL	OI_VAL	Other income

Table 2. P90/P10 Ratio Values for Wages and Salaries of Full-time, Full-year Workers

Income Year	Public-Upper	Public-Lower	Public	Rule of Thumb	Cell-Mean	Internal-Upper	Internal-Lower
1975	6.81	6.81	6.81	6.81	6.81	6.81	6.81
1976	6.89	6.89	6.89	6.89	6.89	6.89	6.89
1977	7.19	7.19	7.19	7.19	7.19	7.19	7.19
1978	6.25	6.25	6.25	6.25	6.25	6.25	6.25
1979	7.07	7.07	7.07	7.07	7.07	7.07	7.07
1980	6.21	6.21	6.21	6.21	6.21	6.21	6.21
1981	6.20	6.20	6.20	6.20	6.20	6.20	6.20
1982	6.80	6.80	6.80	6.80	6.80	6.80	6.80
1983	7.00	7.00	7.00	7.00	7.00	7.00	7.00
1984	6.91	6.91	6.91	6.91	6.91	6.91	6.91
1985	6.67	6.67	6.67	6.67	6.67	6.67	6.67
1986	6.83	6.83	6.83	6.83	6.83	6.83	6.83
1987	7.12	7.12	7.12	7.12	7.12	7.12	7.12
1988	6.82	6.82	6.82	6.82	6.82	6.82	6.82
1989	6.71	6.71	6.71	6.71	6.71	6.71	6.71
1990	7.00	7.00	7.00	7.00	7.00	7.00	7.00
1991	6.28	6.28	6.28	6.28	6.28	6.28	6.28
1992	6.50	6.50	6.50	6.50	6.50	6.50	6.50
1993	6.75	6.75	6.75	6.75	6.75	6.75	6.75
1994	6.63	6.63	6.63	6.63	6.63	6.63	6.63
1995	5.98	5.80	5.94	5.85	5.86	5.86	5.86
1996	6.00	6.00	6.00	6.00	6.00	6.00	6.00
1997	6.30	6.20	6.24	6.20	6.20	6.20	6.20
1998	6.50	6.50	6.50	6.50	6.50	6.50	6.50
1999	7.00	6.90	7.00	7.00	7.00	7.00	7.00
2000	6.71	6.44	6.55	6.55	6.55	6.55	6.55
2001	6.25	6.25	6.25	6.25	n.a.	n.a.	n.a.
2002	6.50	6.35	6.50	6.42	n.a.	n.a.	n.a.
2003	6.67	6.67	6.67	6.67	n.a.	n.a.	n.a.
2004	6.67	6.67	6.67	6.67	n.a.	n.a.	n.a.

Notes. n.a.: not available. The definitions of the series are provided in the main text.

Table 3. P90/P10 Ratio Values for Total Earnings of Full-time, Full-year Workers

Income Year	Public-Upper	Public-Lower	Public	Rule of Thumb	Cell-Mean	Internal Upper	Internal Lower
1975	4.27	4.27	4.27	4.27	4.27	4.27	4.27
1976	4.40	4.40	4.40	4.40	4.40	4.40	4.40
1977	4.63	4.63	4.63	4.63	4.63	4.63	4.63
1978	4.18	4.18	4.18	4.18	4.18	4.18	4.18
1979	4.45	4.45	4.45	4.45	4.45	4.45	4.45
1980	4.29	4.29	4.29	4.29	4.29	4.29	4.29
1981	4.58	4.58	4.58	4.58	4.58	4.58	4.58
1982	4.61	4.61	4.61	4.61	4.61	4.61	4.61
1983	4.66	4.66	4.66	4.66	4.66	4.66	4.66
1984	5.00	5.00	5.00	5.00	5.00	5.00	5.00
1985	4.72	4.72	4.72	4.72	4.72	4.72	4.72
1986	4.86	4.86	4.86	4.86	4.86	4.86	4.86
1987	5.00	5.00	5.00	5.00	5.00	5.00	5.00
1988	4.84	4.84	4.84	4.84	4.84	4.84	4.84
1989	5.00	5.00	5.00	5.00	5.00	5.00	5.00
1990	5.00	5.00	5.00	5.00	5.00	5.00	5.00
1991	5.00	5.00	5.00	5.00	5.00	5.00	5.00
1992	4.92	4.92	4.92	4.92	4.92	4.92	4.92
1993	5.09	5.09	5.09	5.09	5.09	5.09	5.09
1994	5.45	5.45	5.45	5.45	5.45	5.45	5.45
1995	5.00	5.00	5.00	5.00	5.00	5.00	5.00
1996	5.19	5.17	5.17	5.17	5.17	5.17	5.17
1997	5.33	5.33	5.33	5.33	5.33	5.33	5.33
1998	5.38	5.20	5.31	5.23	5.23	5.23	5.23
1999	5.54	5.38	5.54	5.46	5.46	5.46	5.46
2000	5.36	5.36	5.36	5.36	5.36	5.36	5.36
2001	5.31	5.04	5.24	5.11	n.a.	n.a.	n.a.
2002	5.33	5.33	5.33	5.33	n.a.	n.a.	n.a.
2003	5.53	5.47	5.52	5.47	n.a.	n.a.	n.a.
2004	5.67	5.55	5.67	5.60	n.a.	n.a.	n.a.

Notes. As for Table 2.

Table 4. P90/P10 Ratio Values for Size-adjusted Household Income

Income Year	Public-Upper	Public-Lower	Public	Rule of Thumb	Cell-Mean	Internal-Upper	Internal-Lower
1975	6.15	6.15	6.15	6.15	6.15	6.15	6.15
1976	6.11	6.11	6.11	6.11	6.11	6.11	6.11
1977	6.24	6.23	6.23	6.23	6.23	6.24	6.23
1978	6.35	6.32	6.32	6.34	6.33	6.34	6.33
1979	6.44	6.38	6.38	6.42	6.41	6.41	6.41
1980	6.71	6.61	6.61	6.71	6.66	6.66	6.66
1981	6.85	6.84	6.84	6.85	6.85	6.85	6.85
1982	7.53	7.52	7.52	7.53	7.52	7.52	7.52
1983	7.63	7.63	7.63	7.63	7.63	7.63	7.63
1984	7.62	7.62	7.62	7.62	7.62	7.62	7.62
1985	7.67	7.67	7.67	7.67	7.67	7.68	7.67
1986	7.85	7.84	7.84	7.85	7.85	7.85	7.85
1987	7.88	7.87	7.87	7.87	7.87	7.88	7.87
1988	7.91	7.91	7.91	7.91	7.91	7.92	7.91
1989	7.75	7.70	7.70	7.74	7.73	7.75	7.73
1990	7.80	7.76	7.76	7.79	7.78	7.78	7.78
1991	8.01	7.95	7.95	8.00	7.99	8.00	7.99
1992	8.25	8.15	8.15	8.24	8.21	8.22	8.21
1993	8.69	8.55	8.55	8.66	8.62	8.62	8.62
1994	8.53	8.26	8.26	8.48	8.41	8.44	8.41
1995	8.21	8.01	8.10	8.07	8.06	8.09	8.06
1996	8.28	8.10	8.17	8.15	8.16	8.19	8.16
1997	8.48	8.23	8.32	8.28	8.29	8.31	8.29
1998	8.75	7.98	8.26	8.15	8.19	8.22	8.18
1999	8.68	7.74	8.05	7.92	7.96	7.98	7.96
2000	8.59	7.67	7.96	7.87	7.91	7.93	7.91
2001	8.80	7.78	8.07	7.96	n.a.	n.a.	n.a.
2002	8.62	7.96	8.12	8.08	n.a.	n.a.	n.a.
2003	9.05	8.26	8.49	8.40	n.a.	n.a.	n.a.
2004	9.14	8.24	8.43	8.35	n.a.	n.a.	n.a.

Notes: As for Table 2. Also, for year 1983, interest incomes are reported differently in the public and internal data files. The results reported here use numbers from the internal data file.

Figure 1: P90/P10 Ratio Values for Size-adjusted Household Income

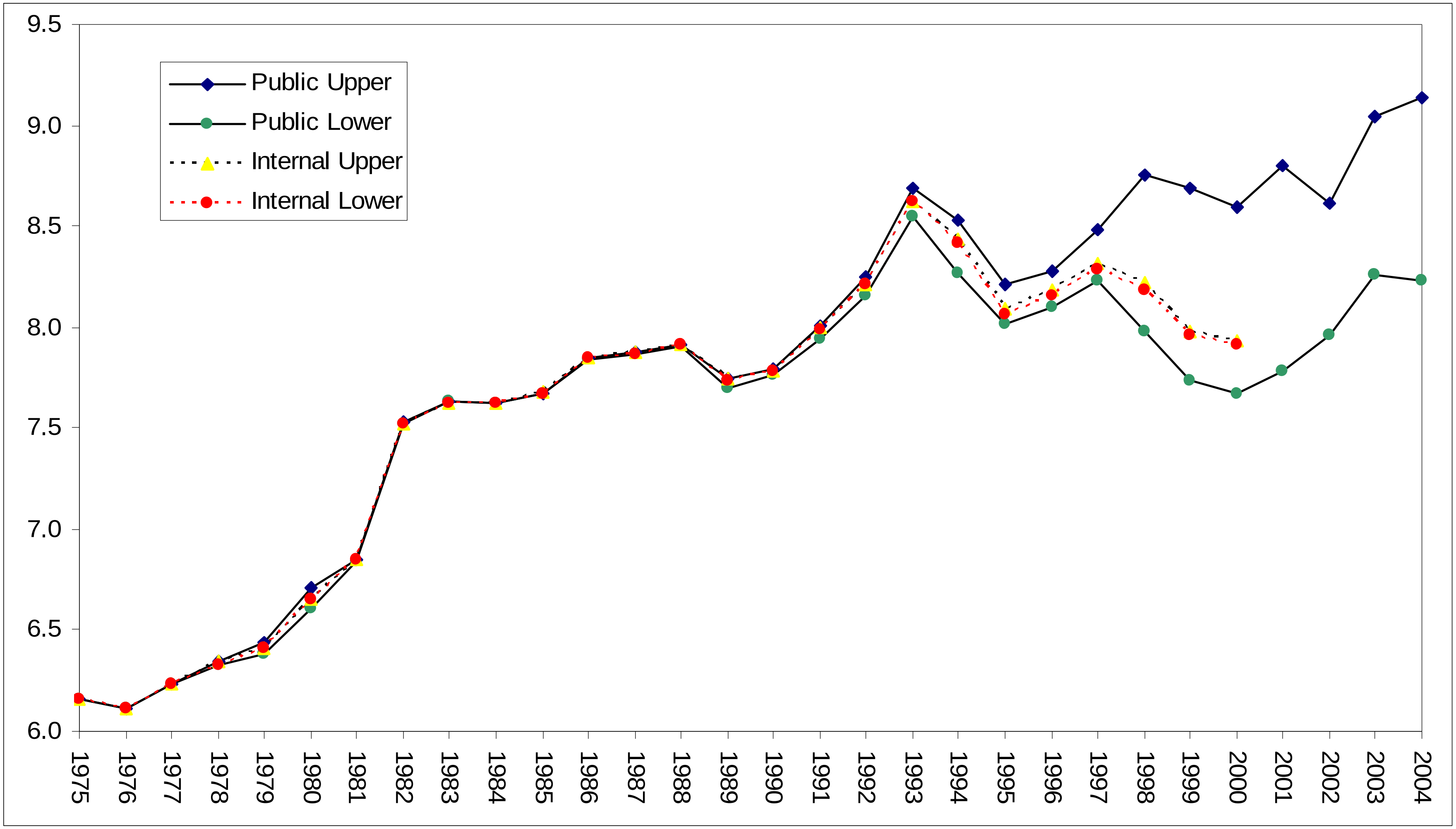


Figure 2. Percentage of Individuals with Size-adjusted Household Income Censored in the Public Use CPS File

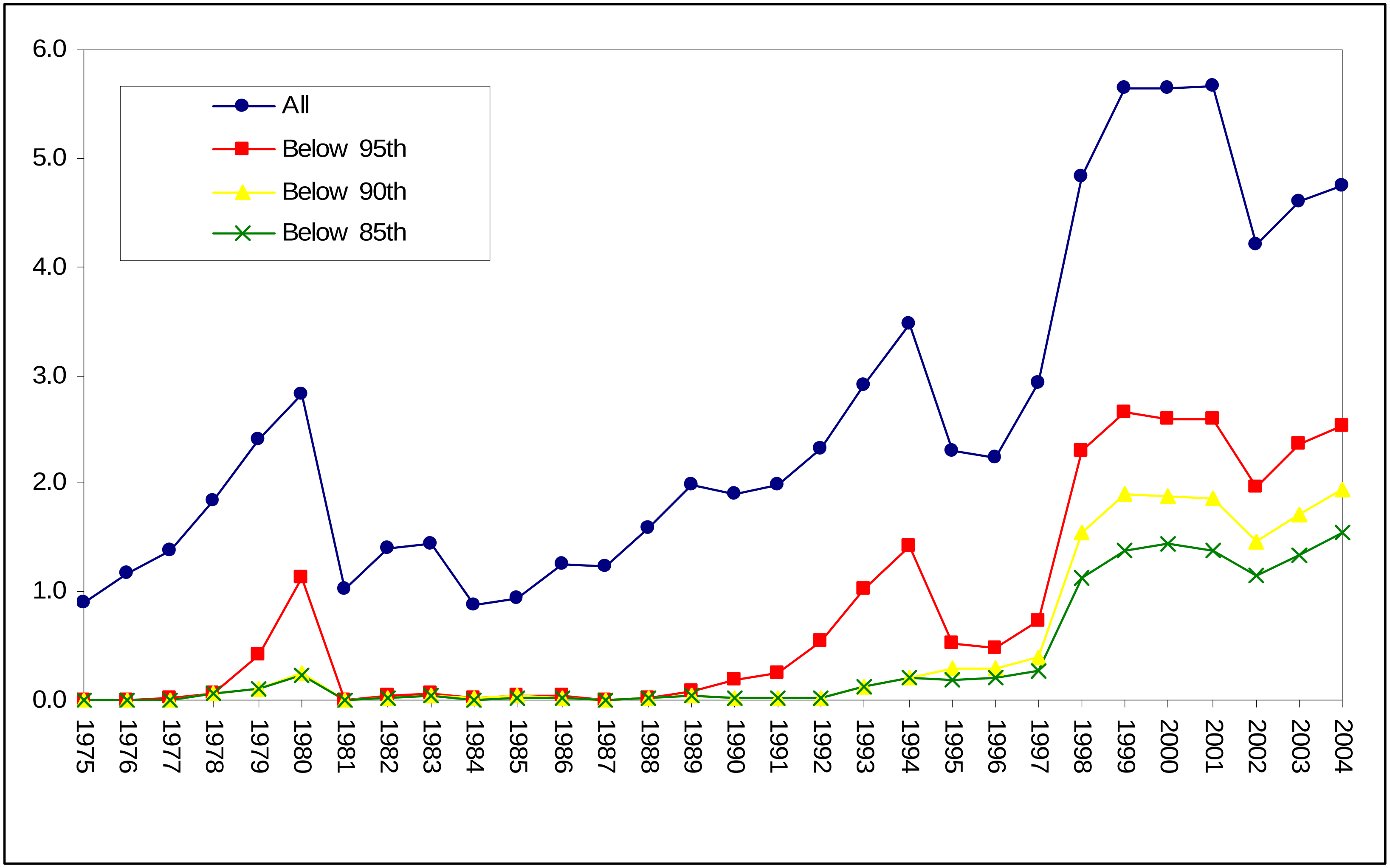


Figure 3. Percentage of Individuals with Censored Size-adjusted Household Income Below the 90th Percentile by Income Source

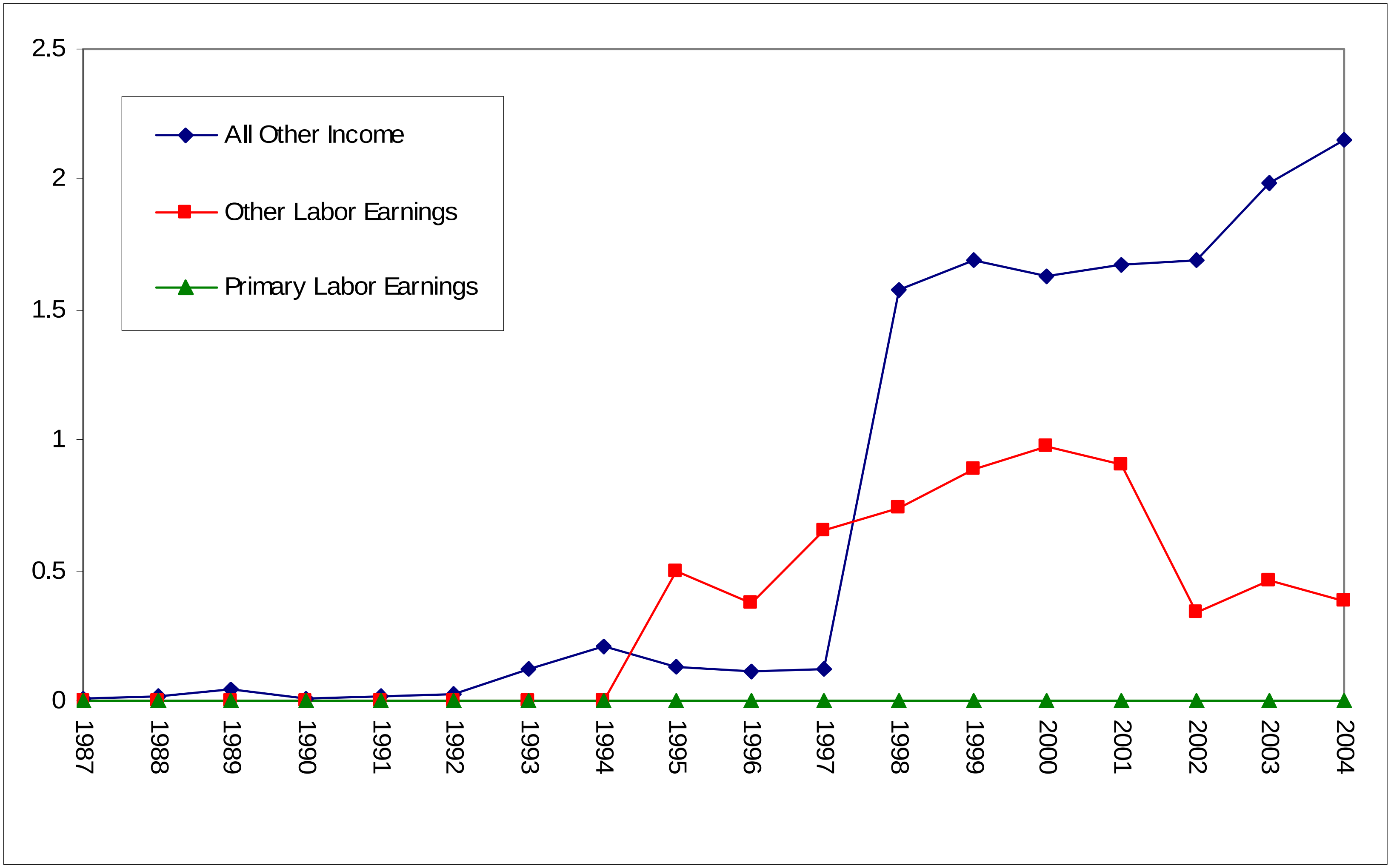
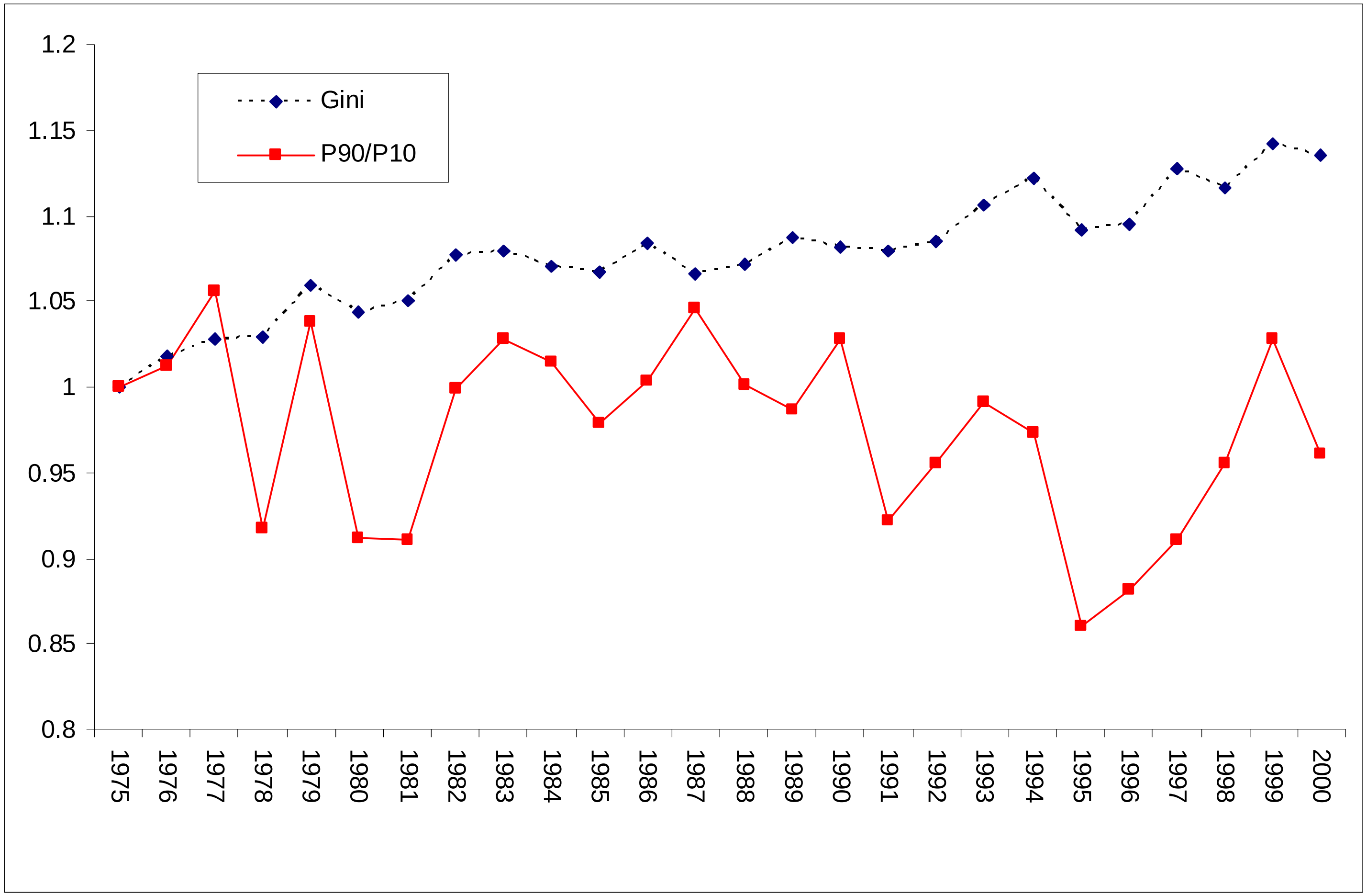
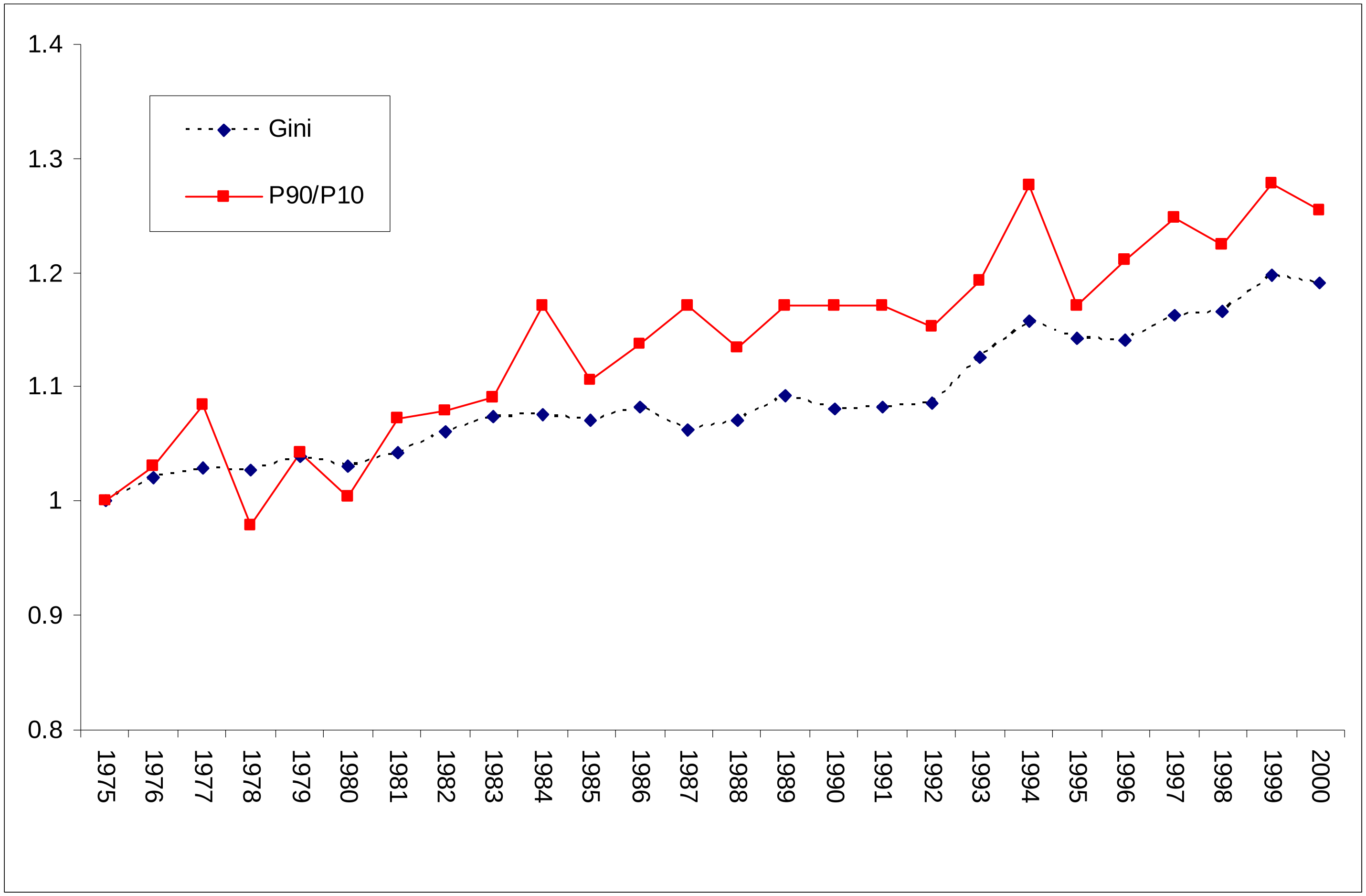


Figure 4. Trends in Gini and P90/P10 Ratios for Wage and Salary Income of Full-time, Full-year Workers



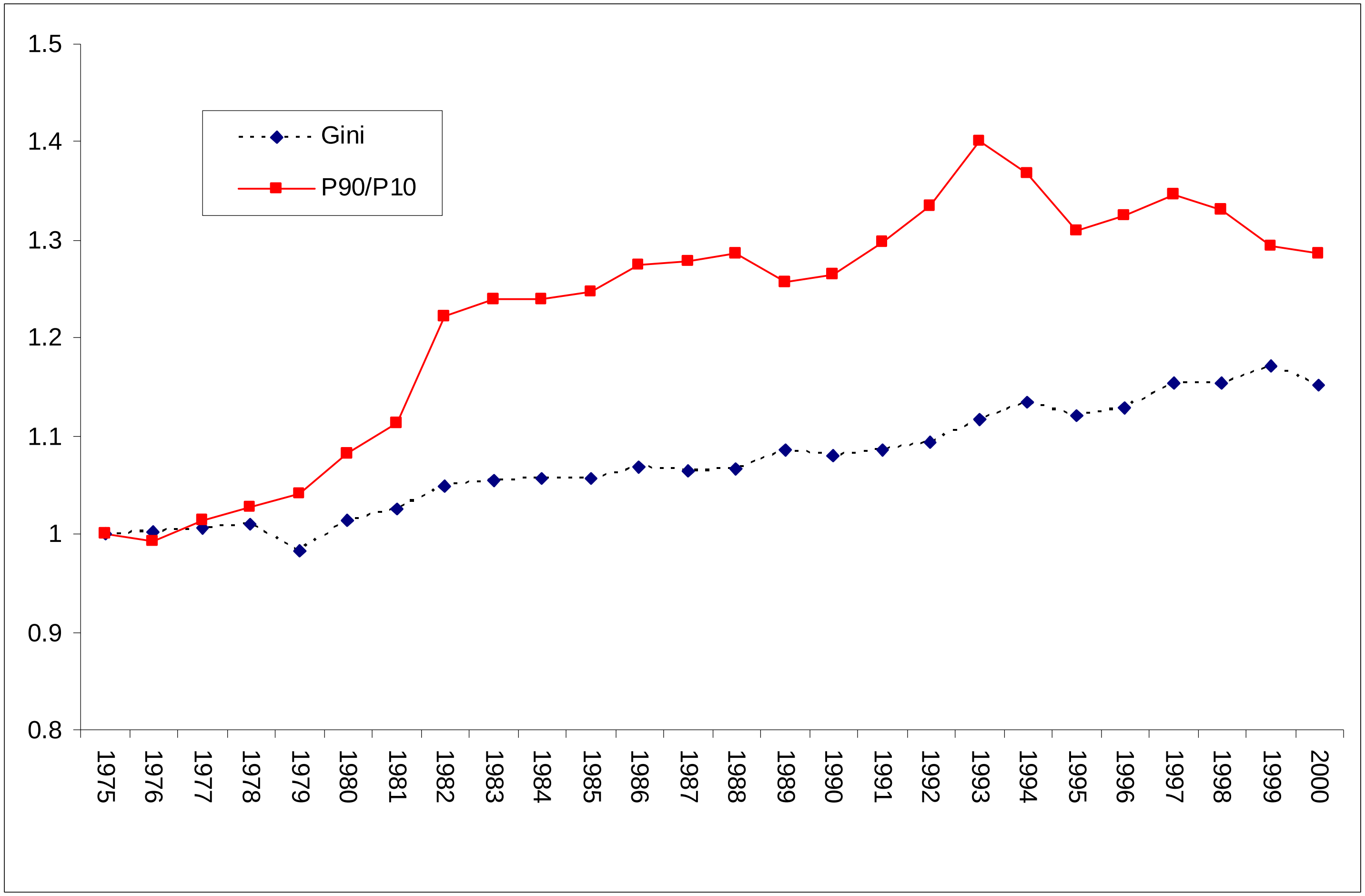
Note: Both the Gini and P90/P10 ratio series are normalized, with the 1975 values equal to 1.

Figure 5. Trends in Gini and P90/P10 Ratio for Total Earnings of Full-time, Full-year Workers



Note: Author's Calculations. Both the Gini and P90/P10 ratio series are normalized, with the 1975 values equal to 1.

Figure 6. Trends in Gini and P90/P10 Ratios for Size-adjusted Household Income



Note: Both the Gini and P90/P10 ratio series are normalized, with the 1975 values equal to 1.

Appendix Table 1. Public Use CPS Censoring Points for each Income Source in Dollars (1975–1986)

	INCWAG	INCSE	INCFRM	INCSS	INCSEC	INCPA	INCINT	INCDIV	INCALC	INCOMP	INCRET
1975	50,000	50,000	50,000	9,999	5,999	19,999	50,000	50,000	50,000	29,999	50,000
1976	50,000	50,000	50,000	9,999	5,999	19,999	50,000	50,000	50,000	29,999	50,000
1977	50,000	50,000	50,000	9,999	5,999	19,999	50,000	50,000	50,000	29,999	50,000
1978	50,000	50,000	50,000	9,999	5,999	19,999	50,000	50,000	50,000	29,999	50,000
1979	50,000	50,000	50,000	9,999	5,999	19,999	50,000	50,000	50,000	29,999	50,000
1980	50,000	50,000	50,000	9,999	5,999	19,999	50,000	50,000	50,000	29,999	50,000
1981	75,000	75,000	75,000	19,999	5,999	19,999	75,000	75,000	75,000	29,999	75,000
1982	75,000	75,000	75,000	19,999	5,999	19,999	75,000	75,000	75,000	29,999	75,000
1983	75,000	75,000	75,000	19,999	5,999	19,999	75,000	75,000	75,000	29,999	75,000
1984	99,999	99,999	99,999	19,999	9,999	19,999	99,999	99,999	99,999	29,999	99,999
1985	99,999	99,999	99,999	19,999	9,999	19,999	99,999	99,999	99,999	29,999	99,999
1986	99,999	99,999	99,999	19,999	9,999	19,999	99,999	99,999	99,999	29,999	99,999

Note: In the 1985 March CPS (income year 1984), six values for INCOMP exceeded $29,999 but were not top coded. In the calculations we did for this paper we corrected this error and top coded these values at $29,999.

Appendix Table 2. Public Use CPS Censoring Points for each Income Source in Dollars (1987–2004)

	INCER	INCWG1	INCSE1	INCFR1	INCSS	INCSEC	INCPA	INCINT	INCDV2	INCRNT	INCALM	INCHLD
1987	99,999	99,999	99,999	99,999	29,999	9,999	19,999	99,999	99,999	99,999	99,999	99,999
1988	99,999	99,999	99,999	99,999	29,999	9,999	19,999	99,999	99,999	99,999	99,999	99,999
1989	99,999	99,999	99,999	99,999	29,999	9,999	19,999	99,999	99,999	99,999	99,999	99,999
1990	99,999	99,999	99,999	99,999	29,999	9,999	19,999	99,999	99,999	99,999	99,999	99,999
1991	99,999	99,999	99,999	99,999	29,999	9,999	19,999	99,999	99,999	99,999	99,999	99,999
1992	99,999	99,999	99,999	99,999	29,999	9,999	19,999	99,999	99,999	99,999	99,999	99,999
1993	99,999	99,999	99,999	99,999	49,999	9,999	24,999	99,999	99,999	99,999	99,999	99,999
1994	99,999	99,999	99,999	99,999	49,999	9,999	24,999	99,999	99,999	99,999	99,999	99,999
1995	150,000	25,000	40,000	25,000	49,999	25,000	24,999	99,999	99,999	99,999	99,999	99,999
1996	150,000	25,000	40,000	25,000	49,999	25,000	24,999	99,999	99,999	99,999	99,999	99,999
1997	150,000	25,000	40,000	25,000	49,999	25,000	24,999	99,999	99,999	99,999	99,999	99,999
1998	150,000	25,000	40,000	25,000	49,999	25,000	24,999	35,000	15,000	25,000	50,000	15,000
1999	150,000	25,000	40,000	25,000	49,999	25,000	24,999	35,000	15,000	25,000	40,000	15,000
2000	150,000	25,000	40,000	25,000	49,999	25,000	24,999	35,000	15,000	25,000	40,000	15,000
2001	150,000	25,000	40,000	25,000	49,999	25,000	24,999	35,000	15,000	25,000	40,000	15,000
2002	200,000	35,000	50,000	25,000	49,999	25,000	24,999	25,000	15,000	40,000	45,000	15,000
2003	200,000	35,000	50,000	25,000	49,999	25,000	24,999	25,000	15,000	40,000	45,000	15,000
2004	200,000	35,000	50,000	25,000	49,999	25,000	24,999	25,000	15,000	40,000	45,000	15,000

Appendix Table 2. (Continued)

	INCUC	INCWCP	INCVET	INCRT1	INCRT2	INCSI1	INCSI2	INCDS1	INCDS2	INCED	INCONT	INCOTH
1987	99,999	99,999	29,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999
1988	99,999	99,999	29,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999
1989	99,999	99,999	29,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999
1990	99,999	99,999	29,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999
1991	99,999	99,999	29,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999
1992	99,999	99,999	29,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999
1993	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999
1994	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999
1995	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999
1996	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999
1997	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999
1998	99,999	99,999	99,999	45,000	45,000	50,000	50,000	35,000	35,000	20,000	30,000	25,000
1999	99,999	99,999	99,999	45,000	45,000	50,000	50,000	35,000	35,000	20,000	30,000	25,000
2000	99,999	99,999	99,999	45,000	45,000	50,000	50,000	35,000	35,000	20,000	30,000	25,000
2001	99,999	99,999	99,999	45,000	45,000	50,000	50,000	35,000	35,000	20,000	30,000	25,000
2002	99,999	99,999	99,999	45,000	45,000	50,000	50,000	35,000	35,000	20,000	30,000	25,000
2003	99,999	99,999	99,999	45,000	45,000	50,000	50,000	35,000	35,000	20,000	30,000	25,000
2004	99,999	99,999	99,999	45,000	45,000	50,000	50,000	35,000	35,000	20,000	30,000	25,000

Appendix Table 3. Internal CPS Censoring Points for each Income Source in Dollars (1975–1986)

	INCWAG	INCSE	INCFRM	INCSS	INCSEC	INCPA	INCINT	INCDIV	INCALC	INCOMP	INCRET
1975	99,999	99,999	99,999	9,999	9,999	19,999	99,999	99,999	99,999	99,999	99,999
1976	99,999	99,999	99,999	9,999	9,999	19,999	99,999	99,999	99,999	99,999	99,999
1977	99,999	99,999	99,999	9,999	9,999	19,999	99,999	99,999	99,999	99,999	99,999
1978	99,999	99,999	99,999	9,999	9,999	19,999	99,999	99,999	99,999	99,999	99,999
1979	99,999	99,999	99,999	19,999	9,999	19,999	99,999	99,999	99,999	99,999	99,999
1980	99,999	99,999	99,999	19,999	9,999	19,999	99,999	99,999	99,999	99,999	99,999
1981	99,999	99,999	99,999	19,999	9,999	19,999	99,999	99,999	99,999	99,999	99,999
1982	99,999	99,999	99,999	19,999	9,999	19,999	99,999	99,999	99,999	99,999	99,999
1983	99,999	99,999	99,999	19,999	9,999	19,999	99,999	99,999	99,999	99,999	99,999
1984	99,999	99,999	99,999	19,999	9,999	19,999	99,999	99,999	99,999	99,999	99,999
1985	250,000	250,000	250,000	19,999	9,999	19,999	99,999	99,999	99,999	99,999	99,999
1986	250,000	250,000	250,000	19,999	9,999	19,999	99,999	99,999	99,999	99,999	99,999

Appendix Table 4. Internal CPS Censoring Points for each Income Source in Dollars (1987–2004)

	INCER	INCWG1	INCSE1	INCFR1	INCSS	INCSEC	INCPA	INCINT	INCDV2	INCRNT	INCALM	INCHLD
1987	299,999	99,999	99,999	99,999	29,999	9,999	19,999	99,999	99,999	99,999	99,999	99,999
1988	299,999	99,999	99,999	99,999	29,999	9,999	19,999	99,999	99,999	99,999	99,999	99,999
1989	299,999	99,999	99,999	99,999	29,999	9,999	19,999	99,999	99,999	99,999	99,999	99,999
1990	299,999	99,999	99,999	99,999	29,999	9,999	19,999	99,999	99,999	99,999	99,999	99,999
1991	299,999	99,999	99,999	99,999	29,999	9,999	19,999	99,999	99,999	99,999	99,999	99,999
1992	299,999	99,999	99,999	99,999	29,999	9,999	19,999	99,999	99,999	99,999	99,999	99,999
1993	999,999	999,999	999,999	999,999	49,999	25,000	24,999	99,999	99,999	99,999	99,999	99,999
1994	1,099,999	1,099,999	999,999	999,999	50,000	25,000	25,000	99,999	99,999	99,999	99,999	99,999
1995	1,099,999	1,099,999	999,999	999,999	50,000	25,000	25,000	99,999	99,999	99,999	99,999	99,999
1996	1,099,999	1,099,999	999,999	999,999	50,000	25,000	25,000	99,999	99,999	99,999	99,999	99,999
1997	1,099,999	1,099,999	999,999	999,999	50,000	25,000	25,000	99,999	99,999	99,999	99,999	99,999
1998	1,099,999	1,099,999	999,999	999,999	50,000	25,000	25,000	99,999	99,999	99,999	99,999	99,999
1999	1,099,999	1,099,999	999,999	999,999	50,000	25,000	25,000	99,999	99,999	99,999	99,999	99,999
2000	1,099,999	1,099,999	999,999	999,999	50,000	25,000	25,000	99,999	99,999	99,999	99,999	99,999

Appendix Table 4. (Continued)

	INCUC	INCWCP	INCVET	INCRT1	INCRT2	INCSI1	INCSI2	INCDS1	INCDS2	INCED	INCONT	INCOTH
1987	99,999	99,999	29,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999
1988	99,999	99,999	29,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999
1989	99,999	99,999	29,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999
1990	99,999	99,999	29,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999
1991	99,999	99,999	29,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999
1992	99,999	99,999	29,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999
1993	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999
1994	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999
1995	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999
1996	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999
1997	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999
1998	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999
1999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999
2000	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999	99,999