Evaluating the Impact of Unrestricted Income Values on Income Distribution Measures Using the Current Populations Survey's Annual Social and Economic Supplement (ASEC)

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There are two restrictions that limit the reporting of high-income values on the ASEC: a data collection limit and a processing limit. Early questionnaires limited the reporting of income by restricting the number of digits available for recording an amount during data collection. This limit was set by the physical restriction of using an optical readable paper questionnaire environment. In 1967, the format of the ASEC questionnaire allowed for the recording of amounts up to $9,999. In 1970, income-recording limits were $99,999. In 1985, the limit for recording earnings from longest job increased to $299,999. In 1993 the physical restrictions imparted by a paper questionnaire virtually disappeared with the advent of computer-assisted data collection, where many of the income sources allowed the recording of amounts to $9,999,999. There were no cases in the 2000 to 2006 ASECs that exceeded the data collection limits for any of the four income sources examined: earnings from longest job, interest, dividends, and rent.

A data processing limit is applied to minimize the impact of recording (keying) errors, help maintain respondent confidentiality, and prevent volatility and distorting of annual statistics. A processing limit, however, compromises the survey's coverage of the income distribution and could distort income inequality measures. Prior to 1993, income recording and processing limits were the same. Beginning with the 1994 ASEC, the processing limits for these four income sources were $1,099,999 for longest job earnings, $99,999 for interest and rent, and $100,000 for dividends.

To gauge the impact processing limits had on income distribution measures, we examined cases from the 2000 to 2006 ASEC with reported income values over the processing limits. We constructed:

1) Summary measures of unrestricted income;
2) Intra-year comparisons of summary measures;
3) Inter-year comparisons of summary measures; and
4) Sample turnover and its impact on summary measures.

Summary of Unrestricted Income

There has been a steady increase since the 2001 ASEC in the number of households with people whose income exceeded the processing limit. There were 61 households in the 2001 ASEC and 124 households in the 2006 ASEC.[1] The 124 households in the 2006 ASEC contained 132 income values over the processing limit. The average household income for those households with income values over the processing limit was $1,046,485. There were 33 cases with earnings values from longest job over the

[1] The 2000 ASEC contained 73 households with amounts exceeding the processing limits.

processing limit with a mean of $2,353,788; 22 cases with interest values over the limit with a mean of $198,091; 21 cases with dividend values over the limit with a mean of $368,564; and 56 cases with rent values over the limit with a mean of $280,249 (see Table 1 and Table 4).

Intra-year Comparisons.
(see Table 2)

On average, the change in the share of aggregate household income between published and unrestricted income over the 2000 to 2006 ASEC period:

- Declined 1.3 percent in the lowest quintile;
- Declined 1.1 percent in the second;
- Declined 1.0 percent in the middle quintile;
- Declined 1.2 percent in the fourth quintile;
- Increased 1.1 percent in the highest quintile; and
- Increased 3.8 percent in the top 5 percent.

The Gini Index increased 1.2 percent on average;
The Mean Log Deviation (MLD) increased 1.8 percent on average;
The Thiel increased 8.2 percent on average; and
The average percent change for the Atkinson ranged from 2.4 percent (e=.75) to 5.8 percent (e=.25).

Inter-year Comparisons.
(see Table 3)

On average, the annual rate of change in the share of aggregate household income for published and unrestricted income 2000 to 2006 ASEC period:[2]

- Declined 0.9 percent for the published and 1.3 percent for the unrestricted incomes in the lowest quintile;
- Declined 0.6 percent for the published and 0.5 percent for the unrestricted incomes in the second quintile;
- Declined 0.3 percent for the published and 0.4 percent for the unrestricted incomes in the middle quintile;
- Declined 0.1 percent for the published and 0.2 percent for the unrestricted incomes in the fourth quintile;
- Increased 0.3 percent for the published and 0.4 percent for the unrestricted incomes in the highest quintile; and
- Increased 0.6 percent for the published and 0.8 percent for the unrestricted incomes in the top 5 percent;

[2] None of the differences between the change by quintile for the published and unrestricted estimates were statistically significant. None of the changes over the time period are statistically different. None of the differences between quintiles for both published and unrestricted estimates were statistically significant.

The Gini Index increased 0.4 percent for the published and 0.5 percent for the unrestricted incomes;[3]
The MLD increased 2.3 percent for the published and 2.4 percent for the unrestricted incomes;[4]
The Thiel increased 1.1 percent for the published and 1.7 percent for the unrestricted incomes; and
The Atkinson ranged from 1.1 percent (e=.25 and e=.50) to 1.3 percent (e=.75) for the published and from 1.3 percent (e=.50) to 1.4 percent (e=.25 and e=.75) for the unrestricted incomes.[5] [6]

Over the 2000 to 2006 period, the share of aggregate household income:

- Declined 5.6 percent for the published estimates and 7.5 percent using unrestricted income in the lowest quintile;[7]
- Declined 3.4 percent for the published estimates and 3.1 percent using unrestricted income in the second quintile;[8] [9]
- Declined 2.0 percent for the published estimates and 2.5 percent using unrestricted income in the middle quintile;[10] [11]
- Declined 0.9 percent for the published estimates and 1.3 percent using unrestricted income in the fourth quintile;[12]
- Increased 2.0 percent for the published estimates and 2.5 percent using unrestricted income in the highest quintile;[13] [14] and
- Increased 3.3 percent for the published estimates and 4.5 percent using unrestricted income in the top 5 percent;[15]

The Gini Index increased 2.4 percent using published estimates and 3.0 percent using unrestricted income;[16]

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[3] The difference between the increases was not statistically significant.
[4] The difference between the increases was not statistically significant.
[5] The difference between the increases was not statistically significant.
[6] The differences between the increases in the Gini, MLD, and Atkinson for both public and unrestricted estimates were not statistically significant.
[7] The decline in the lowest quintile for published income was not statistically different from published income in the second quintile.
[8] The decline in the second quintile for published income was not statistically different from published income in the middle quintile.
[9] The decline in the second quintile for unrestricted income was not statistically different from unrestricted income in the middle and fourth quintile
[10] The decline in the middle quintile for published income was not statistically different from published income in the fourth quintile.
[11] The decline in the middle quintile for unrestricted income was not statistically different from unrestricted income in the fourth quintile.
[12] The differences between the decreases for both published and unrestricted income was not statistically significant.
[13] The increase in the highest quintile for published income was not statistically different from the increase in the top 5 percent.
[14] The increase in the highest quintile for unrestricted income was not statistically different from unrestricted income in the top 5 percent.
[15] The difference for the increase in published income was not statistically significant.
[16] The difference between the increases was not statistically significant.

The MLD increased 14.5 percent using published estimates and 15.1 percent using unrestricted income;[17]
The Thiel increased 6.5 percent for the published and 9.5 percent for the unrestricted incomes; [18] and
The Atkinson ranged from 6.5 percent (e=.25) to 7.8 percent (e=.75) for the published and from 8.1 percent (e=.50) to 8.4 percent (e=.75) for the unrestricted incomes.[19] [20]

Sample Turnover and its Impact on the Number of High Income Cases and Means by Income Source.

Table 4 shows the number and mean amounts for cases with incomes over the processing limits over the 2000 to 2006 ASEC period. Table 5 shows the percentage change from the previous year in the numbers and means for incomes over the processing limits. On average, each of the income sources showed increases in number and means over the 2001 to 2006 ASEC period. Rent had the largest average annual increase in the number of cases (26.8 percent) followed by longest job earnings (11.9 percent), dividends (9.1 percent), and interest (8.7 percent). These averages mask, however, the wide annual variations that occurred. For example, between the 2001 and 2002 ASEC the number of cases with rental income over the processing limit jumped 173 percent (38 cases) while between 2000 and 2001, the number of interest cases fell 31 percent (five cases). The mean unrestricted income values also showed wide annual variations. The mean unrestricted dividend value increased 145 percent between the 2000 and 2001 ASEC followed by a 53 percent decline the next year. Alternating patterns of increases and decreases were common between the 2000 and 2006 ASECs for each of the income source numbers and means.

Conclusions

Based on this research comparing income distribution summary measures with and without data processing limits over the 2000 to 2006 ASEC period, there is little statistical evidence that unrestricted income have much impact on distribution summary measures. For example, none of the increases in the annual rate of change in the shares of aggregate household income by quintile for published and unrestricted income were statistically significant. Furthermore, the differences between increases based on published and unrestricted incomes for the Gini, MLD, Theil and Atkinsons over the 2000 to 2006 period were not statistically significant. In addition, the volatility of the number of cases with income over the data processing limits and the wide annual

[17] The difference between the increases was not statistically significant.
[18] The increases in the Theil and each of the Atkinsons for both published and unrestricted income were not statistically significant.
[19] The difference between the increases was not statistically significant.
[20] The increase in the Atkinson (e=.25) were not statistically significant from the increases in the Gini Index and MLD for unrestricted income .

variations in the means based on unrestricted income values is a concern since the ASEC does not sample high-income households with any certainty. Even though using unrestricted income values resulted in very few statistically different distribution summary measures, the volatility from year to year in the number and values of these high income cases could eventually lead to statistically different results that may be caused by sample and not changing economic conditions.

We suggest then, to keep the current processing limits. Doing so does not seem to impact overall distribution summary measures, while minimizing the possibility of recording false change due to sample fluctuations and the use of unrestricted income values. We will continue to monitor the impact of processing limits on income distributional measures and be ready to increase or remove the limits should the need arise.