

Online Appendix

"Improving the Measure of the Distribution of Personal Income"

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I. NIPA totals by category

We first decompose each item in Table 2.9 into components that can then be distributed to the relevant households.

Online Appendix Table A: NIPA subtotals in billions from Table 2.9*

^P denotes items that make up Pseudo Income; ^F denotes items that make up Financial Income; ^H denotes items that make up Health Income; ^T denotes items that make up Net Transfers

| | 2007 | 2012 |
|--|--------------------------------|--------------------------------|
| <i><u>Household income</u></i> | <i><u>11,989.26</u></i> | <i><u>14,001.55</u></i> |
| <i>Compensation of employees</i> | <i>7,878.86</i> | <i>8,566.73</i> |
| Wage and salary Disbursements ^P | 6396.8 | 6927.5 |
| Pension and profit sharing ^F | 407.5 | 439.7 |
| Group Life Insurance ^F | 17.8 | 12.4 |
| Group Health Insurance ^H | 517.1 | 597.2 |
| Old-age, survivors, disability, and hospital insurance ^H | 395.5 | 427.9 |
| Military medical insurance (received) ^H | 4.0 | 5.5 |
| Publicly administered government employee insurance funds ^H | 11.5 | 10.5 |
| Workers' Compensation ^T | 65.9 | 65.7 |
| Supplemental Unemployment ^T | 0.5 | 0.5 |
| Other ^T | 62.1 | 79.9 |
| <i>Proprietors' income with inventory valuation and capital consumption adjustments</i> | <i>994.0</i> | <i>1347.3</i> |
| Farm ^P | 40.3 | 60.9 |
| Nonfarm ^P | 953.8 | 1286.4 |
| <i>Rental income of households with capital consumption adjustment</i> | <i>179.1</i> | <i>508.8</i> |
| Rental income from owner occupied housing ^F | 97.6 | 353.5 |
| Other private business rental income ^P | 81.5 | 155.3 |
| <i>Household income receipts on assets</i> | <i>2126.7</i> | <i>2118.8</i> |
| Household interest income | 1335.3 | 1310.5 |

| | | |
|---|----------------------|----------------------|
| Monetary interest – Pensions ^F | 193.9 | 166.7 |
| Imputed interest received by households from depository institutions ^F | 145.1 | 154.4 |
| Life Insurance Carriers ^F | 255.4 | 249.0 |
| Imputed interest received from property and casualty insurance companies ^F | 11.8 | 10.7 |
| From employee pension plans ^F | 366.3 | 450.3 |
| Monetary interest - IRA, KEOGH, Mutual Funds ^P | 362.9 | 279.4 |
| <i>Household dividend income</i> | <i>791.4</i> | <i>808.4</i> |
| Household dividend income ^P | 791.4 | 808.4 |
| <i>Household current transfer receipts</i> | <i>1771.9</i> | <i>2410.4</i> |
| <i>Government social benefits</i> | <i>1679.7</i> | <i>2300.1</i> |
| Medicare ^H | 428.2 | 554.7 |
| Medicaid ^H | 324.2 | 417.5 |
| Other state & local medical care ^H | 12.6 | 13.9 |
| Social security ^P | 575.7 | 762.1 |
| Unemployment insurance ^P | 32.7 | 83.6 |
| Railroad retirement ^P | 9.8 | 11.4 |
| Pension benefit guaranty ^P | 2.5 | 2.4 |
| Veterans Benefits ^P | 41.6 | 70.0 |
| Workers' compensation (received) ^P | 14.4 | 13.2 |
| Temporary disability insurance ^P | 4.8 | 5.5 |
| Black lung benefits ^P | 0.6 | 0.4 |
| Supplemental security income ^P | 42.2 | 53.0 |
| Other public assistance and income maintenance ^P | 33.1 | 37.3 |
| Education assistance ^P | 20.8 | 28.6 |
| State & local employment & training ^P | 1.0 | 1.0 |
| Alaska dividend payments ^P | 1.0 | 0.6 |
| SNAP ^T | 30.9 | 74.9 |
| Refundable tax credits ^T | 60.1 | 98.7 |
| Energy Assistance ^T | 2.7 | 4.1 |
| WIC Food ^T | 5.4 | 6.8 |
| Retired military personnel and dependents at nonmilitary facilities ^T | 2.1 | 1.8 |
| All other government social benefits ^P | 33.2 | 58.5 |
| <i>From business (net)</i> | <i>18.2</i> | <i>23.9</i> |
| Other current transfer receipts, | 18.2 | 23.9 |

| | | |
|---|--------------|--------------|
| from business (net) ^T | | |
| <i>From nonprofit institutions</i> | 74.0 | 86.4 |
| Household current transfer receipts from NPISHs ^P | 74.0 | 86.4 |
| <i>Less: Contributions for government social insurance, domestic</i> | 961.4 | 950.5 |
| Supplementary medical insurance ^H | 47.9 | 60.4 |
| Employer's actual social contributions ^T | 461.7 | 513.3 |
| Employee's actual social contributions ^T | 402.3 | 330.0 |
| Self-employed ^T | 49.5 | 46.8 |

*Items in bold and italics are calculated subtotals. Table 2.9 last revised on November 20, 2018.

II. Imputation Strategies

The general strategy for assigning incomes to each individual proceeded as follows: the NIPA total (see disaggregation of Table 2.9 above) was allocated proportionally to individuals (then aggregated up to households) or households which satisfied conditions pertaining to the category in the CPS. For example, “Household Dividend Income” was distributed to individuals by the weighted amount of dividends for each person as a share of the total amount of dividend income in the CPS. If total dividend income in the CPS is \$123b, an individual reporting \$100 of dividend income with a weight of 656.04 would receive a share of 8.129e-10, and correspondingly would receive a value of \$657.09 of NIPA dividend income (\$808.36b). In this way, we preserve the distribution of dividend income while scaling the values up such that the total is equal to the NIPA total. Many of the NIPA items were able to be allocated solely on the basis of information available in corresponding CPS categories. Items which were allocated using outside sources of information are described below.

- a. Imputed Interest: In moving from pseudo income to Personal Income, the single largest component to add is imputed interest (See FJFC, Table 2). The category contains the imputed interest from financial institutions, insurance companies and pensions. To allocate the PI imputed interest total, we use information from the Survey of Consumer Finances (SCF) to determine the shares of income that come from interest. Those shares are based on nominal values of checking and savings accounts balances, cash value of life insurance policies, and retirement accounts balances as reported in the SCF for each income band. For example, for households with incomes between \$100,000, and \$200,000, the total cash value of life insurance policies is \$1.94b in 2012. The total cash value of life insurance policies received by households in the SCF is \$11.7b. Therefore, households in the CPS with incomes between \$100,000, and \$200,000 are allocated a “share” of $1.94/11.7=0.166$. Once this share has been imputed into the CPS, it is allocated

proportionally (by household weight) for each relevant household, as applicable, such that all households together in that income category receive 0.166 of the NIPA value, in this case \$10.7b for Imputed Interest Received from Property and Casualty Insurance Companies. The same methodology is used to impute other imputed interest components

- b. Medicare: In order to impute the value of Medicare for each household, we allocated actual per capita costs by state for those ages 65+ and under 65 to those who reported receiving Medicare benefits in the CPS in each state. These costs are derived from state-level summary files reported by the Centers for Medicare & Medicaid Services (CMS).
- c. Medicaid & SNAP: Two of the variables believed to be underreported in the CPS are Medicaid reciprocity and the Supplemental Nutrition Assistance Program (SNAP). To compensate the Congressional Budget Office (CBO) has created an adjustment method for allocating these values to CPS individuals. We use the CBO imputations, as described in Habib (2018) for Medicaid and SNAP. For more information on the CBO imputation procedure, please see Habib (2018) CBO working paper.
- d. Supplementary Medical Insurance: This category is based on the distribution of Medicare Part D enrollment. The Medicare Part D enrollment data comes from the CMS Statistics Reference Booklet, specifically tables I.3 and I.4. We used enrollment by age group for Parts A and/or B and Part D to compute a ratio of Part D to Parts A/B enrollment for age groups <65, 65-74, 75-84, and 85+. For example, in calendar year 2012 there were 23.396 million enrollees in Part A/B and 13.712 million Part D enrollees for the age group 65-74. Accordingly, 58.61% ($13.712/23.396$) of CPS individuals ages 65-74 who reported receiving Medicare benefits were randomly allocated a portion of Supplementary Medical Insurance by household weight. Individuals belonging to the other age groups were similarly allocated.
- e. Rental Income from Owner Occupied Housing: Rental values were calculated for each household using information derived from the Consumer Expenditure Survey (CE) produced by the Bureau of Labor Statistics. For each consumer unit in the CE, the reported value of the “Estimated Rental Value of Owned Home” was taken as a share of the reported “Income Before Taxes”. For example, if a household reported a monthly estimated rent of \$1,000 (therefore \$12,000 annually) and an income of \$30,000, it would receive a share of $12000/30000=40\%$. Outliers were removed (i.e., the top 1% of resulting shares). Income deciles were constructed from ranked household income in the CE and the median share per decile was then used to create a crosswalk. Income deciles were constructed for CPS households ranked on money income. Each owner-occupied

CPS household then received the corresponding median rental income share for its income decile.

- f. WIC: Program Costs for WIC came from their annual report, WIC Program Participation and Costs found here: <https://www.fns.usda.gov/pd/wic-program>. Program costs were distributed to CPS individuals reporting WIC reciprocity.
- g. Alaska Dividend: Dividend payments by the State of Alaska to residents can be found here: <https://pfd.alaska.gov/Division-Info/Summary-of-Applications-and-Payments>. Each CPS individual residing in Alaska was allocated a share of the total.

III. CPS Pareto tail enhancement

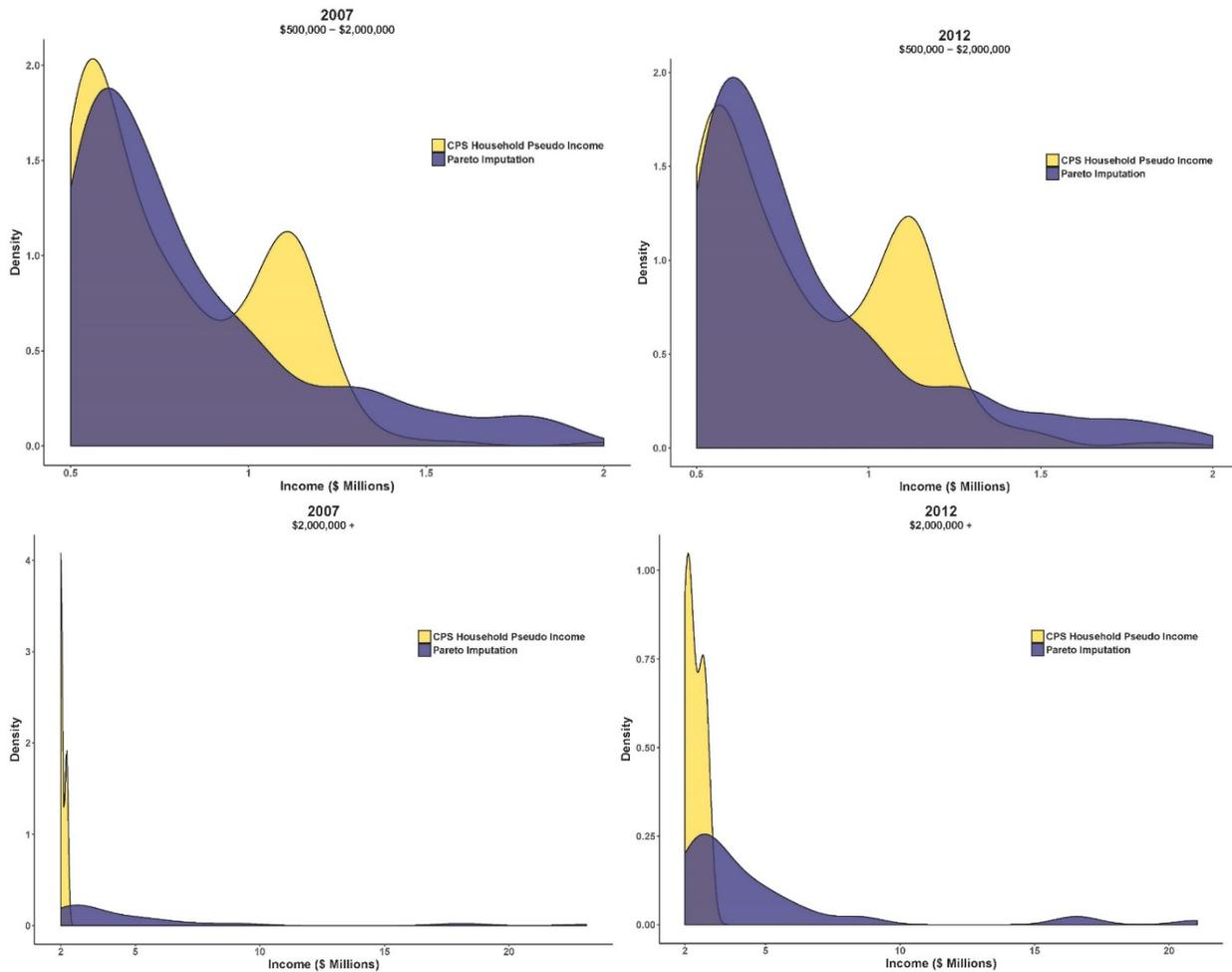
Using nonpublic microdata from the Form 1040 Federal income tax data housed at the Census Bureau, we fit a Pareto distribution for tax units with money incomes of at least \$500,000. The Pareto distribution used is

$$F(x) = 1 - \left(\frac{x}{x_0}\right)^{-\alpha}$$

where x is income and x_0 is \$500,000 of income. Alpha is the estimated parameter by fitting a Pareto distribution by Maximum Likelihood to the aforementioned 1040 microdata. For more information, see STATA package *paretofit*.

A comparison of the CPS pseudo income distribution and the imputed Pareto-based distribution can be seen in Online Appendix Figure A below for 2007 and 2012. The top panel shows the income brackets from \$500,000 to 2 million dollars; the bottom shows the distribution from 2 million dollars and above. The top panel shows that the Pareto distribution fits CPS incomes very well (note that the heaping of CPS data is caused by internal topcodes). The bottom panel shows that using the Pareto imputation replaces the incomes of some CPS households with values outside of the CPS possibilities to be more in line with the administrative data.

Online Appendix Figure A: Pareto Imputation and CPS Pseudo Income 2007 and 2012



IV. Supplementary Tables

Online Appendix Table B: Components of Personal Income with Totals and Averages for 2007 and 2012 in 2012 dollars*

2012

| | Household average | Totals (millions) |
|-------------------------|--------------------------|--------------------------|
| Pseudo Income | \$87,636 | \$10,731,889 |
| Plus | | |
| Financial | \$14,998 | \$1,836,604 |
| Health | \$16,062 | \$1,966,896 |
| Net Transfers | -\$4,359 | -\$533,839 |
| Equals | | |
| Household Income | \$114,336 | \$14,001,550 |
| +NPISH | \$70 | \$8,593 |
| Personal Income | \$114,406 | \$14,010,143 |

2007

| | Household average | Totals (millions) |
|-------------------------|--------------------------|--------------------------|
| Pseudo Income | \$89,095 | \$10,404,862 |
| Plus | | |
| Financial | \$14,003 | \$1,635,363 |
| Health | \$15,407 | \$1,799,312 |
| Net Transfers | -\$6,231 | -\$727,641 |
| Equals | | |
| Household Income | \$112,275 | \$13,111,895 |
| +NPISH | \$173 | \$20,261 |
| Personal Income | \$112,449 | \$13,132,157 |

*Note: Totals may not add up due to rounding. See Table A for components that make up each category

Online Appendix Table C: Quintile distribution of household income by component: 2012 and 2007 in 2012 dollars

2012

| Household income | Total (\$B) | % Q1 | % Q2 | % Q3 | % Q4 | % Q5 |
|--|--------------------|-------------|-------------|-------------|-------------|-------------|
| Compensation of employees | 8566.7 | 4% | 7% | 14% | 24% | 51% |
| Proprietors' income with inventory valuation and capital consumption adj. | 1347.3 | 1% | 2% | 4% | 11% | 83% |
| Rental income of households with capital consumption adj. | 508.8 | 5% | 10% | 14% | 20% | 52% |
| Household income receipts | 2118.9 | 1% | 3% | 7% | 13% | 75% |
| Household interest income | 1310.5 | 2% | 4% | 9% | 17% | 67% |
| Household dividend income | 808.4 | 0% | 1% | 3% | 7% | 89% |
| Household current transfer receipts | 2410.4 | 16% | 25% | 25% | 18% | 16% |
| Government social benefits | 2300.1 | 16% | 26% | 26% | 17% | 14% |
| From business (net) | 23.9 | 1% | 4% | 11% | 24% | 60% |
| From nonprofit institutions | 86.3 | 5% | 8% | 14% | 26% | 47% |
| Less: Contrib. for government social insurance, domestic | 950.5 | 4% | 10% | 17% | 26% | 43% |
| Household Income | 14001.6 | 5% | 9% | 14% | 20% | 52% |

2007

| Household income | Total (\$B) | % Q1 | % Q2 | % Q3 | % Q4 | % Q5 |
|----------------------------------|--------------------|-------------|-------------|-------------|-------------|-------------|
| Compensation of employees | 8616.6 | 4% | 8% | 15% | 24% | 50% |

Updated 1/10/2019

| | | | | | | |
|--|----------------|-----------|-----------|------------|------------|------------|
| Proprietors' income with inventory valuation and capital consumption adj. | 1087.1 | 1% | 3% | 7% | 14% | 75% |
| Rental income of households with capital consumption adj. | 195.9 | 5% | 9% | 13% | 19% | 54% |
| Household income receipts | 2325.8 | 2% | 3% | 7% | 13% | 75% |
| Household interest income | 1460.3 | 2% | 5% | 9% | 17% | 67% |
| Household dividend income | 865.5 | 0% | 1% | 3% | 7% | 88% |
| Household current transfer receipts | 1937.8 | 17% | 27% | 23% | 17% | 15% |
| Government social benefits | 1837.0 | 18% | 28% | 24% | 17% | 13% |
| From business (net) | 19.9 | 1% | 4% | 12% | 24% | 59% |
| From nonprofit institutions | 80.9 | 3% | 7% | 13% | 24% | 53% |
| Less: Contrib. for government social insurance, domestic | 1051.4 | 5% | 10% | 17% | 26% | 43% |
| Household Income | 13111.9 | 5% | 9% | 14% | 20% | 52% |

Online Appendix Table D: Inequality statistics for equivalized household income for 2007 and 2012

| | Mean | Gini | 90/50 | 90/10 | Top5% Share | Top 1% share |
|---------------------------------------|-------------|-------------|--------------|--------------|--------------------|---------------------|
| 2012 | | | | | | |
| Eq. HH Money Income | \$46,587 | 0.4557 | 2.6430 | 9.5380 | 22.18% | 8.79% |
| Eq. HH Pseudo Income (with tail adj.) | \$57,166 | 0.5243 | 3.0413 | 10.909 | 29.66% | 14.14% |
| Eq. HH Income | \$74,407 | 0.4629 | 2.7154 | 6.3326 | 27.07% | 13.08% |
| 2007 (in 2012 dollars) | | | | | | |
| Eq. HH Money Income | \$48,279 | 0.4408 | 2.5853 | 9.0453 | 21.61% | 7.40% |
| Eq. HH Pseudo Income (with tail adj.) | \$46,848 | 0.5019 | 2.8558 | 9.9135 | 28.18% | 12.92% |
| Eq. HH Income | \$73,022 | 0.4532 | 2.6483 | 6.2508 | 26.51% | 12.46% |