

Accounting for the Distribution of Income in the U.S. National Accounts

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Has income increased or not?





Issue is that CPS income tracks National Accountsea Personal Income until recently





GDP and Distribution Information

- Long recognized that in gauging economic performance GDP cannot stand alone; distribution information needed
- Is there a positive or negative correlation between income distribution and economic growth?
- Kuznets curve—upside down U



Evaluating the income distribution and its relationship to National accounts is not new

- 1st NBER volume Mitchell, et al. 1921. Income in the United States: Its Amount and Distribution, 1909-1919
- CRIW volume 1943 Income Size Distributions in the United States, Part I.
- CRIW Volume, 1975 The Personal Distribution of Income and Wealth, James D. Smith, ed., 1975.
- Office of Business Economics (the predecessor to BEA) early reports - Goldsmith (1955) "Income Distribution in the United States, 1950-53," *Survey of Current Business*.





Recent Emphasis on Distribution

- Stigliz et al: information on distribution serves as an important complement to GDP
- 2012 Economic Report of the President: distributional aspects of fiscal policy
- IMF Working Paper: "Innocent Bystanders? Monetary Policy and Inequality in U.S." WP/12/199 August 2012
- Gordon "Misperceptions About the Magnitude and Timing of Changes in American Income Inequality" NBER Working Paper 15351



Is Inequality related to Growth







Purpose of Research

- BEA FY11 budget proposal, which included producing "a decomposition of personal income that presents median as well as mean income..."
- Because survey data suffer from under-reporting, determine how to deal with measurement error in income
- Demonstrate that one can use NIPA data to adjust survey data to obtain alternative distributions and measures of inequality.
- Provide examples of the usefulness of the distribution measures on expenditure multipliers and social welfare measures





The Measurement of Income

- Use the Haig-Simons definition of income, Income (Y) = Consumption (C) plus change in wealth (ΔW).
 - Most studies do not implement this definition
- Census Money income is different (conceptually and empirically) than BEA Personal Income
- Issue is that there is underreporting of income in household surveys
- Key is that a common, consistent and accurate measure of income is important for understanding the distribution.



Alternative measures of Income

SOURCE	Haig/ Simons	Census	PI (BEA)	СВО	SOI (AGI)	Canberra
Employment income	Yes	Yes	Yes	Yes	Yes	Yes
Employer contribution to Soc Sec	Yes	No	Yes	Yes	No	Yes
Employer-provided benefits	Yes	No	Yes	Yes	No	Yes
Investment income	Yes	Yes	Yes .	Yes	Yes	Yes
Imputed investment income	Yes	No	Yes	No	No	No
Government cash transfers	Yes	Yes	Yes	Yes	Yes (taxable)	Yes
Employee contribution to Soc Sec	Yes	Yes	No (subtract)	Yes	Yes	Yes
Retirement income	Yes	Yes	No (only int.)	Yes	Yes	Yes
Cash assistance from others	Yes	Yes	No	Yes	No	Yes
Realized capital gains	Yes	No	No	Yes	Yes	No
Lump sum (IRA disbursements)	Yes	No	No	Yes	Taxable	Yes
In-kind government transfers*	Yes	No	Yes	Yes	No	No**
Other In-kind transfers*	Yes	No	No	No	No	No**
Home production	Yes	No	No	No	No	In concept
Imputed rent*	Yes	No	Yes	No	No	Yes
Unrealized capital gains	Yes	No	No	No	No	No
Savings withdrawals	Yes	No	No	No	No	No





Data and Methods

- Begin with Household Income from Current Population Survey, 1999-2010
- Obtain total income and components -- wages, business income, property income, retirement income, government transfers, other
- Use Adjusted Personal income (from Katz (2012)) to ratio adjust CPS income
- Adjust measures to 2010(\$) using PCE deflator
- Calculate Adjusted Gross Income
- Use SOI tables to ratio adjust the distribution of income



Adjustments to Personal Income, Selected Years, in billions of 2010 dollars

Adjustments	to Personal	Income,	Selected	Years
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	1999	2007	2010
Personal Income	10,030	12,546	12,374
Employer health benefits	(450)	(637)	(620)
Employer pensions benefits	(267)	(396)	(470)
Imputed interest	(433)	(480)	(457)
Imputed rent for homeowners	(187)	(68)	(236)
Government transfers in-kind	(575)	(919)	(1,132)
Adjustment for social security contributions	428	526	514
Adjustments for pension treatment	(148)	123	257
Other adjustments	(100)	(92)	(167)
Total adjustments	(1,731)	(1,943)	(2,311)
Adjusted Personal Income	8,299	10,603	10,062
Census Money Income	7,387	8,316	8,015





Ratio adjusting CPS income

- Ratio adjust CPS to NIPA totals by source
- This procedure increases each household's income by source, and then the new data is used to obtain distribution measures (the procedure yields a mean for each source that matches the NIPA totals).
- Because higher income households have more property income and business income, their income is adjusted higher.





Adjusting CPS to Personal Income

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CPS Income

Wages,...

Business,...

Property,...

Retirement,...

Government transfers,...

Other,....

Adjustment factors (i j) **NIPA** income

Wij (+ supplements) Bij Pij (+ imputed int) Rij

Gij (+ health benefits)

Adj Wage Adj Bus. Adj Prop Adj Retire Adj Gov't Adj Other



Adjustment Factors





Income shares



Ratio adjusting CPS distribution of income using SOBEA table

- Ratio adjust CPS distribution by the SOI totals by source and income level
- This procedure increases each household's income by source and by income level, and then the new data is used to obtain distribution measures (the procedure yields a mean for each source that matches the NIPA totals).

$$y_{i} = \frac{NIPAwages}{CPSwages} \times \frac{\overline{CPSwages}}{\sum_{k} \frac{SOIwages}{CPSwages}} \times wages_{CPS,i}$$

 Because higher income households have higher underreporting, their income is adjusted higher while middle income households are adjusted lower.

SOI Factors used to adjust CPS income (ratio of aggregate income by source for level of AGI), 2009

Summary of Results between 1999 and 2010

- Real mean household income fell 5.7 percent, while per capita personal income increased 11.1 percent
- Using a more comparable definition of income, the mean adjusted real personal income per household increased 5.3 percent.
- Taking into account differences in the price index, accounting for underreporting and incorporating distributional information from both the CPS and SOI data, we obtain an increase of 5.7 percent (between 1999 and 2009)
- Hence, difference of 17 percentage points falls to 0.4 percentage points.
- In addition, there are larger increases in the median, yielding larger increases in inequality and Gini index increases more
- However, including health benefits: employer provided health, Medicaid and Medicare increases means, but decreases the level of and change in inequality

Mean NIPA-adjusted income increases more than meanA Household income

Median NIPA-adjusted income increases more than median^{BEA} Household income, but less than Mean NIPA-adjusted

Levels and Trends in Inequality

Distribution of income and consumption and **BEA** multipliers: an application

- How does the income distribution affect the Keynesian expenditure multiplier?
- Economic Report of the President, among others, suggests that because lower income categories have higher MPC, then a redistribution can increase the size of the multiplier.
- This is an old concern: Stone and Stone (1938), Goodwin (1949), Chipman (1950) and Conrad (1955)
- Consider a simple closed economy in which the autonomous expenditures include all expenditures except consumption

Calculating an expenditure multiplier

- Use $Y_i = A_i + c_i Y_i$, $dY_i = dA_i + c_i dY_i$
 - Where Y_i denotes income, A_i autonomous expenditure, and c_i the marginal propensity to consume for the ith income class and

$$\begin{bmatrix} dY_1 \\ \vdots \\ dY_N \end{bmatrix} = \begin{bmatrix} I - C \end{bmatrix}^{-1} \begin{bmatrix} dA_1 \\ \vdots \\ dA_N \end{bmatrix}$$

- Where I is the identity matrix and C the diagonal matrix of the c_i
- Using Dynan (2012) estimate of income elasticity of consumption, e, to obtain MPC, i.e., MPC=e*APC

Alternative APCs over time and across the distribution

Using the quintile distributions of income and consumption in McCully (2012), we obtain a an expenditure multiplier of 5.75. A constant MPC across income categories yields a multiplier of 5.48 (for a .27 difference)

Social Welfare Function: An application

- Consider µ(1-G) as the SWF (as in Sen (1973));
 µ is the mean income and G in the respective Gini coefficient
- Similar to Jorgenson (1990), Jorgenson and Slesnick (2012) and Jones and Klenow (2011)
- Larger increases in income yield larger increases in SWF, while larger increases in inequality diminish increases in SWF.

Changes in income, inequality and SWF

Conclusion and Future Work

- Almost 60 years ago, Kuznets (1955) stated: "Today, there is increased concern about the skewed income distribution, and the increase in skewness over time."
- We constructed two straightforward ways to provide a distribution to NIPA Personal Income
- We show that many subjective decisions are part of the transformation
- Future work involves analysis of the matched household data with the tax records to more completely measure income underreporting.
- Multiplier analysis will be improved by incorporating similar decompositions of PCE and personal income that rely on the distribution of the household survey data (as in McCully (2012))
- The results in this paper may provide a framework for developing measures of median personal income and their distribution that could be produced on a regular basis.

