Distributing National Income in the US: Alternative Income Definitions and Data Issues

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Abstract:
As a result of growing concerns about income inequality, there has been increased interest in better measuring the distribution of income and comparing levels and changes over time and across countries. This paper examines issues related to developing income measures that accurately reflect the economic welfare of the overall population and various subgroups. It also considers problems that can complicate or bias comparisons of income distributions and economic welfare across countries. Appropriate measures of income are important for policy analysis in evaluating the progressivity of the current tax system and proposals for change.

Outline
I. Introduction
II. National income and Other Definitions of Income
III. Issues with Data Used to Estimate the Distribution of Income
IV. Issues in Comparing the Income Distribution in the U.S. with Other Countries
V. Recent Research on the Distribution of Income in the U.S.
VI. Conclusions

Note: All views expressed in this paper are those of the author and do not necessarily reflect the views or policies of the U.S. Treasury Department.

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D63 Equity, Justice, Inequality, and Other Normative Criteria and Measurement
National Income and Other Definitions of Income

Broad measures of economic income should include all labor and capital income (net of the expenses of earning that income) as well as cash and non-cash transfers. Various measures have been proposed for use in measuring the distribution of income and economic welfare. Each has its advantages and disadvantages.

An ideal measure would include wages, self-employment income, business profits, non-wage employee compensation (private health insurance and other fringe benefits such as childcare), imputed rent from owner-occupied housing, public and private pensions, cash and non-cash transfers (e.g., unemployment insurance and government provided health insurance or health care). Many of these income sources are not reported or incompletely reported in tax data, survey data or both.

A long-standing preferred measure of economists is the Haig-Simons concept of economic income, sometimes described as equaling consumption plus the change in net worth and including these income sources. A key feature of this definition of income is the inclusion of annual accrued capital gains or losses adjusted for inflation. The International Standard for National Accounting (European Commission et al. 2008), and Integrated Macroeconomic Accounts produced by the Federal Reserve Board and Bureau of Economic Analysis incorporate accrued capital gains into income.

Another measure, national income, has been proposed as the best broad measure of income for comparing income distributions within and across countries. The World Inequality Database (WID), for example, is based on distributing national income.¹ In the United States, researchers in the Bureau of Economic Analysis (Fixler, et al., 2020) estimate the distribution of Personal Income, another national accounts measure in the U.S. that includes transfers and other income received by individuals (and removes social insurance contributions).

Due to data limitations, other researchers (and some government agencies) have used more ad hoc definitions of broad measures of income that do not necessarily total up to any measure in the national accounts. One type of such measures is commonly labelled as "expanded income" or "broad income". These measures typically start with Adjusted Gross Income as reported in tax data and add income items not in this baseline measure. For example, the Tax Policy Center’s expanded cash income (Rosenberg, 2013) starts with Adjusted Gross Income on tax returns and adds tax exempt interest, non-taxable Social Security benefits and other cash and non-cash transfers, and employer provided fringe benefits such as health insurance. The Joint Committee on Taxation measure of expanded income and the Treasury Department measure of cash income follow similar approaches, The Treasury measure of income also includes the income of dependents in the tax unit and the expected value of accrued gains at death (Cronin, 2022). In the distant past, Treasury included in its measure of Family Economic Income both income accruing in retirement accounts and income from later withdrawals after retirement (Nelson, 1987). While double-counting retirement income, this approach avoided the problem of understating the incomes of either retirees or those accumulating assets for use after retirement.

There are advantages and disadvantages for each of these income measures. While the Haig-Simons approach is often considered the preferred measure by economists, actually estimating the distribution of

¹ The WID website provides the following discussion: "We prefer the concept of national income (NI), i.e. GDP minus consumption of fixed capital (capital depreciation) plus net foreign income. National income is more meaningful because it takes into account the depreciation of the capital stock (including in principle natural capital), which is not an income to anyone, as well as the fraction of domestic output that is transferred to foreign capital owners (including in principle offshore wealth). For instance, a country with a large GDP but extensive capital depreciation and foreign outflows does not have much income to distribute to its residents and citizens. The national income concept reflects this." The WID data for the U.S. are the distributional national account analysis of Saez and Zucman https://gabriel-zucman.eu/usdina/
accrued gains is necessarily imprecise because micro data rarely have all the information needed. The closest in the United States to having the components of Haig-Simons income is the Survey of Consumer Finances which has information on both income and assets and oversamples high income and wealth households. In severe economic downturns, such as the Great Recession in 2009, that reduce housing as well as stock and other business values, total income of much of the population can turn negative (Larrimore, et al, 2021). International comparisons would be difficult as many countries may not have the data or resources to make such estimates.

An important advantage of national income is that it is measured by most countries and there are international standards for how it should be defined. For example, under current standards adopted about a decade ago, income should be measured on an accrual basis. As a measure of economic welfare across the income distribution, however, national income falls short. National income is a measure of earned income from labor and capital. Therefore, it omits transfer payments that can be the primary source of income for some households. While measuring national income on an accrual basis has theoretical appeal, it can be misleading about the economic welfare of some population groups. For example, the earnings on income saved for retirement in retirement accounts (such as in Individual Retirement Accounts (IRAs) in the United States) are counted as they accrue, typically greatest when individuals are also in their peak earnings years. After retirement, any, perhaps most, households will be counted as having little or no income as they draw down their retirement accounts and collect Social Security pension benefits from the government. Using national income as the standard can thus significantly overstate the inequality of actual economic welfare.

The U.S. measure of personal income is broader than national income in that it includes cash and non-cash transfers excluded from national income. Although many of the components are the same as in national income, personal income does not include corporate income unless distributed as dividends. By including transfers, this measure does a better job of capturing economic welfare. But since it is on an accrual basis, it can still overstate measured inequality by understating the income of the retired population as well as overstating income available for consumption around the time of peak life-cycle earnings years.

The treatment of capital gains is an important consideration and the effects of alternative approaches vary considerably. The primary options include realized capital gains, annual accrued capital gains net of losses, real realized or accrued gains and losses, and proxy variables consistent with the basic definition being used. The income measures used by CBO, JCT, Treasury and the Tax Policy Center all include realized capital gains. Most of these gains were accrued over many years and some reflect large one-time realizations such as selling a business. This can overstate measured top income shares in cross-section data. Studies based on national income include retained earnings of businesses, which can be considered a proxy for accrued gains based on the view that over time real capital gains will reflect the value of retained earnings.

Issues with Data Used to Estimate Income Distributions

The two primary sources of data for estimating the distributions of income are administrative tax data and surveys. Each source has advantages and shortcomings. In some cases, data from these sources have been combined.

Administrative tax data are particularly valuable for measuring incomes at the top of the income distribution. Since many sources of income are subject to third party information reporting to the Internal Revenue Service

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2 Piketty, Saez and Zucman (2018) and other recent publications by these authors finessed this issue by deviating from the actual definition of national income. Their estimates count Social Security benefits when received and net out the payroll taxes that fund the Social Security program. This approach turns out to have little net effect on top income shares but can affect incomes in the lower part of the distribution and in different age groups.
(the U.S. tax authority), the amounts reported on individual income tax returns for these sources are thought to be highly accurate. For example, employers are required to report wages to both tax authorities and employees. Other sources with information reporting include interest and dividends, pensions and distributions from retirement accounts are also believed to be accurate. Distributions from pass-through businesses (partnerships, and S corporations) are subject to information reporting by the business entity, though this can be subject to underreporting by the entity. As discussed below, business income from sole proprietorships and rental activity are believed to be substantially underreported in tax data.

There are several important limitations of administrative tax data, some of which also affect survey data. One important limitation of tax return data is that many components of national income (up to 40 percent in the U.S.) are not reported on tax returns, although in some cases some evidence is available on information returns. The most important are certain non-wage employee compensation, accruing income on retirement accounts, and imputed rental income from owner-occupied housing. In the U.S., employer sponsored health insurance is not taxable income for employees. Other fringe benefits, such as employer benefits for childcare and contributions to private pension plans, are also exempt from income tax. Pension benefits are later subject to tax when received (including distributions from IRAs and other similar accounts). Social Security benefits have been partially taxable since 1984, and completely exempt from tax for low-income households. The Adjusted Gross Income of these taxpayers excludes the exempt amounts and therefore understates economic income, although this can be corrected as the full amounts are supposed to be reported on Form 1040.

Another limitation of income tax data in the U.S. is that some important expenses of earning income are only deductible for taxpayers that itemize deductions rather than claim a standard deduction. This means that a portion of Adjusted Gross Income (AGI) is more a measure of gross receipts than economic income. Before 2018, employee business expenses were deductible to the extent they exceeded 2 percent of AGI. Only 50 percent (80 percent for certain truck drivers and other special cases) of business meals were deductible as an allowance for the personal benefits. From 2018 through 2025, only certain limited employee groups (such as those with impairment-related work expenses, and certain performing artists) are allowed to deduct employee business expenses. This temporary provision also eliminated deductions for other expenses of producing income such as tax preparation fees. Investment interest expense is still deductible to the extent of investment income taxable at ordinary rates (i.e., capital gains and dividends receiving preferential rates don't count for this purpose). Unused investment interest can be carried forward to future years and can be deducted when assets are sold. Gambling losses also remain deductible up to the amount of gambling winnings.

The incentive to misreport (generally underreport) income to reduce tax liabilities is another limitation of tax data. The U.S. has long conducted special detailed audit studies that can examine all income and deductions on returns as well as look for other evidence of misreported income on information returns. Since 2001, these have been conducted under the National Research Program (NRP). Under the assumption that these audits don't discover all missing income, the IRS adds an allowance for undiscovered income using detection control estimation (DCE). The basic idea is to estimate the additional income and tax revenue that would be collected

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3 The U.S. provides a small exemption to account for any employee contributions to retirement accounts out of after-tax income. These are based on life expectancy tables and usually a small percentage of income, such as 3 or 4 percent. Large amounts of non-taxable pensions and distributions from IRA and similar accounts reflect rollovers of assets from one account to another. Non-taxable distributions from Roth accounts are still relatively small.

4 Social Security benefits of taxpayers with Modified AGI plus 50% of these benefits under $32,000 for married taxpayers filing jointly ($25,000 for most other taxpayers) are exempt. 50% of benefits over this threshold are subject to tax. Up to 85% of benefits over higher threshold ($44,000 for joint returns, $34,000 for other filers) are included in taxable income. This percentage reflects an allowance for the non-deductibility of the payroll taxes paid while they were working. 85% of benefits over higher threshold ($44,000 for joint returns, $34,000 for other filers) are included in taxable income. This percentage reflects an allowance for the non-deductibility of the payroll taxes paid while they were working.

5 See Bloomquist et al. (2007) for a discussion of the NRP program and DCE analysis.
if all of the auditors found as much underreported income as the most successful auditors. On average, this adds just over $2 for each $1 discovered in these detailed audits.

Recent research has pointed out that the NRP detailed audits studies have only found small fractions of hidden offshore income and entity-level underreporting of pass-through income. Research on offshore income before and after recent compliance efforts affecting offshore reporting (such as the Foreign Account Tax Compliance Act, often referred as FATCA) and linking entity-level underreporting is still getting started. To the extent that new reporting requirements and enforcement efforts have increased reporting of offshore income since 2011, this could result in increases in top income shares that reflect improved reporting of offshore income rather than an actual increase in inequality. Similarly, given the limited data that includes both individual underreporting and underreporting at the partnership, corporation, or other entity level, it is unclear whether this underreporting is already accounted for in the DCE analysis of underreported income not found in the NRP audits.

Additional insights on underreported income is provided in research by Auten and Langetieg (2021). Approximately one-third of underreported business income is from overstated business losses. There are also wide variations in the extent of underreporting. Among taxpayers reporting incomes in the middle of the distribution of reported income, for example, a small percentage are found to have reported as little as 5 or 10% of their true business income. Adding this income can move them well up in the distribution, though only a few migrate to the top 1%. In addition, while over half of taxpayers with high reported incomes are found to have some underreporting, the amounts are typically small relative to their reported income.

Survey data has some advantages over tax data. It is generally available more quickly than tax return data. It also typically includes more socioeconomic information valuable for both research and policy analysis. In the U.S., usefulness of Census data has been limited by top coding of income items, substantial underreporting of income and declining response rates over time (Meyer, et al, 2015). In recent years, nearly one-third of the items were missing and had to be imputed. Research by Bruce Meyer (Meyer, et al., 2021) has found that after correcting data errors, most of those reported as below the poverty level actually have incomes well above the poverty level The Federal Reserve Board's Survey of Financial Characteristics overcomes many of these problems. It oversamples high income households and includes data on income and wealth and many other related variables. Limitations include the relatively small sample size and being conducted only every three years.

While some countries have long had integrated data systems that combined tax and integrated data, such integrated has been limited in the United States. For over 50 years, the IRS has provided the Census Bureau population tax return files for its use. But these datasets included only a very limited set of variables. Several recent initiatives have been made to develop more comprehensive data including tax, Census and other administrative records. The Bureau of Economic Analysis has developed new estimates of the distribution of personal income using integrated data combining, tax, Census and some other administrative data. While initially only estimated for a few years, the most recent estimates include all years from 2000 through 2019 as discussed further below. The University of Chicago has initiated the Comprehensive Income Dataset Project (https://cid.harris.uchicago.edu/) to create a new comprehensive dataset to develop more accurate measures of economic well-being in the U.S. The National Academy of Science recently held a conference on "An Integrated System of Household Income, Wealth, and Consumption Data and Statistics to Inform Policy and Research" as a first step toward much more comprehensive system of data. Another effort is the Census Bureau's National Experimental Well-being Statistics (NEWS) project to improve income estimates by combining Census and other administrative data.
Issues in Comparing the Distribution in the U.S. to that in Other Countries

Because of widely varying tax regimes, many problems arise when trying to compare income distributions across countries. Issues include different tax units and different business types of business organizations, effects of tax reforms and details of specific tax rules.

One key issue in comparing the income distributions in different countries based on tax data is the tax unit. In the U.S., the tax unit includes both individuals in married households and certain dependents. Children can be claimed as dependents up to the age of 18 and may be claimed until age 23 if they are full-time students and the parents are providing over half of their support. While the income of some dependents is included on the parents’ returns, many dependents with sufficient income file separate tax returns. Returns of these dependent filers are included in published IRS statistics and most appear to be very poor tax units if not removed and their income attributed to the appropriate tax unit. The U.S. tax unit definition differs from the definition of a household in some cases. A tax unit may include dependents living elsewhere, but these would not be counted in the definition of a household. On the other hand, some individuals, such as co-habiting adults, may be living in the household but are not part of the tax unit.

A recent OECD (2021) report on tax policy and gender equality found that over two-thirds of responding countries had individual filing and another 21 percent had optional individual or household filing. Only three countries had only household unit filing. Depending on the proportions of one or two earner households and part-time and full-time employment, this could lead to misleading comparisons of income distributions in different countries. Such differences in tax units could result in misleading comparisons of the distribution of income in different countries.

Another important difference between the US (and other Anglo countries) and other countries is that a much smaller share of business income is earned by C corporations. Most businesses in the US are organized as passthrough businesses: sole proprietorships, partnerships, and S corporations. These structures avoid the potential double tax on corporate profits and distributions (usually dividends) to which C corporations are potentially subject. In the US, passthrough businesses can benefit from limited liability treatment, which is often limited to C corporations in other countries. The shift of business activity away from C corporations in the U.S. was triggered by the effects of the Tax Reform Act of 1986 which made the corporate income tax rate higher than the top individual income tax rate. While the corporate rate has been lower than the top individual rate since 1997, the shift to the passthrough form has continued over time (see Cooper, et al., 2016). In recent years, the corporate share of total business taxes has dropped further, from 55 percent in 2016 to 47 percent in 2019. This drop reflects the drop in the corporate income tax rate from 35 percent to 21 percent. While the income and incidence of taxes on pass-through businesses is reported on income tax returns, The retained earnings and income taxes on C corporations must be allocated. The variations across countries in the C corporation share of business activity and the uncertainties in allocating C corporation income and taxes to individuals could lead to misleading comparisons of the income distributions in different countries.

Just as the Tax Reform of 1986 caused a shift in business activity that caused more business income to be reported on individual tax returns, tax reforms in other countries have also affected estimates of the distribution of income. For example, Alstadsæter et al. (2015) found that an increase in the dividends tax rate in Norway reduced dividends paid and increased corporate retained earnings. This reduced the top one percent income share on individual returns by about one-third. Wolfson, Veall, and Brooks (2016) estimated that including retained earnings of private corporations increased the Canadian top one percent income share in 2011 by about a third. Thus, comparisons across countries over time need to avoid potential bias from failing to account for these reforms.
A recent study by Blanchet, Chancel, and Gethin (forthcoming) between 1980 and 2017, the share of pretax income that accrued to the richest 1% Europeans rose from 8% to 11% before taxes and transfers and from 7% to 9% after taxes and transfers. These are shown to be nearly identical to after-tax estimates for the U.S. in AS (2022). This is because higher U.S. top pre-tax income shares are offset by greater progressivity in the U.S. tax system. In 2017, redistribution lowers the pre-tax top one percent incomes share in Europe by 2 percentage points but lowers it by 5 percentage points in the U.S..\(^6\)

**Recent Research on the Distribution of Income in the U.S.**

The distribution of income in the United States has long been of interest to economists. Using data on tax returns Piketty and Saez (2003) concluded that top income shares had more than doubled since 1980. This paper helped trigger broader public concerns about rising inequality and stagnating incomes for lower and middle-class households. But this paper was criticized by academics for using a narrow definition of income that failed to account for the dramatic growth of Social Security, Medicare and other transfer programs and for ignoring the effects of declining marriage rates and smaller household size (Burkhauser, Larrimore, and Simon, 2012).

More recent work by Piketty, Saez and Zucman (2018) addressed some of these issues using a broader income measure based on national income, but still found large increases in top income shares. Their new analysis has also been criticized for overstating top income shares due to certain assumptions used to allocate income not reported on tax returns (Auten and Splinter, 2022; Kopczuk and Zwick 2022; Smith, Zidar, and Zwick, forthcoming).

As illustrated in Figure 1, the PS, PSZ and AS studies all estimate that the top one percent shares declined in the late 1960s and 1970s due to the combined effects of rising inflation, the 1968-1970 income tax surcharge, and recessions in 1970 and 1973-74. All also estimate at least some increase since 1979. However, there are clear differences in these estimates in all years. In early periods, the PS fiscal income measure has the lowest top share estimate, major reasons being the exclusion of Social Security benefits and other transfers and corporate retained earnings in a period when corporations accounted for most business activity in the U.S. The PS top income share increased dramatically when business activity shifted to pass-through businesses with income included on individual tax returns in response to changed incentives from the Tax Reform Act of 1986.\(^7\) The PS top one percent share more than doubled from 1979 to recent years. The PSZ estimates are less volatile, and the net increase is much less than in PS. Their share remains high, however, because of certain assumptions used to allocate the nearly 40 percent of national income not reported on individual tax returns (see AS, 2022 and earlier versions). While PSZ includes Social Security benefits, there is little effect on top income shares because it subtracts the associated payroll taxes with a similar distribution. The AS measure of pre-tax income closely follows the definition of national income and estimates lower shares even though transfers are not included. The addition of Social Security, Medicare and other transfers reduces both the level and the increase in the top share more over time as transfers increased substantially.

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\(^6\) One reason for this may be that the top tax rates apply to a much larger share of the population in order to finance more generous social welfare programs. This may be less true currently due to the reduction in the top individual tax rate from 39.6 to 37 percent. But more accurate estimates would require careful analysis of the effects of base-broadening provisions and other changes such as the $10,000 cap on itemized deductions for state and local taxes that have the greatest effect on the highest income taxpayers.

\(^7\) Other factors included the use of tax units which biased estimates by not accounting for declines in marriage rates except at the top of the distribution, dramatic increases in transfer payments and increases in realized capital gains due to lower tax rates. The inclusion of realized capital gains also makes this series the most volatile.
The diversity of estimates of levels and trends in the top one percent share is illustrated in Figure 2. There is considerable variation in the estimates in top income shares, the extent of the increase since 1979 and the volatility over business cycles. Studies including realized capital gains (PS, CBO) are the most volatile over the business cycle. The original Piketty-Saez (2003) study based on fiscal income including realized capital gains is highly volatile with the highest shares in recent decades and largest increases since the 1960s and since 1979. The PSZ series based on distributing national income is less volatile as realized gains are essentially replaced by retained earnings in businesses and components of national income not in tax data are less volatile. Using the Survey of Consumer Finances, Bricker et al. (2020) estimated that the top one percent share of their broader augmented income measure increased 2 percentage points from 15 to 17 percentage points between 1988 and 2018 and is lower than either PS or PSZ. This share ranged from 13 to 20 percent, partly reflecting the business cycle, but possibly due to the small sample even at the top of the distribution.8

Using tax data supplemented by Census data, the Congressional Budget Office estimated that the top one percent share of before-tax income increased by 6 percentage points (from 9 to 15 percent) between 1979 and 2013). This series is highly volatile due to its use of realized capital gains. Burkhauser et al. (2012) is the only

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8 Bricker et al (2020) also reports the results in the Federal Reserve Bulletin article that use a narrower definition of income and as a result has been one percentage point higher since the 2004 survey and lower in all but one of the surveys back to 1989, resulting in a larger increase over the full period.
one based only on Census Data and estimated that the top one percent share increased 4 percentage points (from 10 to 14 percent) between 1967 and 2006. This study developed an approach to overcome the top-coding in Census data for its estimates.

While there is always uncertainty about distributional analysis, the best available evidence suggests that top income shares are lower and have increased less than some have claimed and that real incomes have increased over time for all income groups, though not necessarily for every household.

Conventional studies of changes in the distribution of income over time are based on comparing annual cross-section data in different years. Language about "the top one percent" tends to create the impression that it is the same people in the top income groups over time. But other important literatures in economics make it clear that this isn't the case. Income mobility studies follow the incomes of individuals, households, or tax units over time. Using panel data, Auten and Gee (2009) followed individuals over decades from 1987 to 1996 and 1996 to 2005 and found that real incomes increased the most among those initially in the bottom two income quintiles and less in the middle and top two quintiles. At the same time, real incomes declined over 30% for those initially
in the top 1% in each period. In addition, this study found that relative income mobility remained constant between the two periods in spite of wider spreads between the income groups. This was because real median incomes rose more rapidly in the more recent period except for the top 1%. Within the top 1%, the median declines from 1996 to 2005 were greater for those with the very highest incomes: a 37% decline for those initially in the 99–99.9 percentile and a 64% decline for those in the top 0.01% group. More recently, Splinter (2021) has also found similar results over a longer time period.

Another perspective on income dynamics is provided by studies that found there is considerable turnover at the top of the income distribution. Auten, Gee, and Turner (2013), for example, found that only 34% of those in the top 1% in 2005 were there five years earlier in 2000 and only 16% were continuously in the top 1% over this period. Looking after 2005, only 25% remained continuously in the top 1% for five years. At the very top of the income distribution, the IRS found more than 4,500 different taxpayers in the annual top 400 tax returns between 1992 and 2014 (www.irs.gov/pub/irssoi/14intop400.pdf). Moreover, the top 400 taxpayers in 2014 had $14.5 billion in charitable deductions, about 14 percent of their taxable income. Herschl and Rank (2015) found that about 70% of the population is in the top income quintile at least once and about 11% is in the top 1% at least once between the ages of 25 and 60. Other research by these authors (Rank and Herschl, 2015) found that many individuals experience at least temporary spells in the bottom of the distribution: 62 percent were in the bottom 20% and 42% were in the bottom 10% of the income distribution at least once between age 25 and 60. Studies of income volatility in the United States have generally found that income volatility has increased over time, which could account for some of the increase in top income shares. The basic lesson from this research is that it is not the same people at either the top or the bottom of the income distribution all the time.

Conclusions

Inequality of income and wealth has become one of the defining issues of our time. It is therefore important to take great care with our estimates and consider various dimensions of income dynamics over time. The Auten and Splinter (2019, 2020) analysis suggests that there has been some increase in cross-sectional inequality from 1980 to the present but likely much less than suggested by PS and PSZ. Other studies have reached similar conclusions. Our research, as well as that of others, also shows that real incomes have increased over time in all income groups rather than stagnating, and that the Federal tax system has become more rather than less progressive since 1980. This is not to say that the issue of inequality is not of concern, but rather that care should be taken to ensure that economic analysis reflects the best possible analysis..
References


World Income Database (WID) Methodology https://wid.world/methodology/