How Invisible Capital Gains Drive Extreme Wealth Concentration: Evidence from Balance-Sheet-Complete Haig-Simons Accounting

Roth, Steve and Bezemer, Dirk

University of Groningen

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How Invisible Capital Gains Drive Extreme Wealth Concentration: Evidence from Balance-Sheet-Complete Haig-Simons Accounting

Steve Roth, steve@steve-roth.com
Dirk Bezemer, University of Groningen

Researchers of income, wealth and inequality have long called for data on total "Haig-Simons" income, which includes accrued capital gains. We integrate NIPA income and saving measures with Integrated Macroeconomic Accounts (IMAs) data to derive an open-access, balance-sheet-complete data set of 1960-2023 "Total U.S. Haig-Simons Household Income Accounts" (THIAs) for U.S. households, with distributional estimates covering 2000-2023. We highlight five trends in this data that all contribute to the increased U.S. wealth concentration since the late 1970s. For instance, 86% of Haig-Simons saving since 2000 accrued to the top 20% of households (by income), driven heavily by asset-price increases, plus top households' lower and declining propensities to consume.

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Abbreviations used: CEX: Consumer Expenditure Survey. DFA: Distributional Financial Accounts. DINA: Distributional National Accounts. DPCEA: Distribution of Personal Consumption Expenditure Accounts. DPIA: Distribution of Personal Income accounts. FA: Federal Reserve Financial Accounts (F, L, and B tables). IMA: Integrated Macroeconomic Accounts. NIPA: National Income and Product Accounts. OECD: Organization for Economic Cooperation and Development. SCF: Survey of Consumer Finances. SNA: System of National Accounts. WID: World Inequality Database.

> "*The greatest trick capital-gains income ever managed was convincing the world that it doesn't exist.*" —Carlos Mucha (inventor of the Platinum Coin)

This paper makes two contributions. It offers in the accompanying Excel workbook an open-access data set constructed from the U.S. national accounts, of household-sector Haig-Simons Income, its derivatives, and their analytical import — data series which economists have been expressing a desire for over many years. The data set is here dubbed the Total Household Income Accounts, or THIAs. Second, we provide five key insights into the data set's analytical import. Compared to series based only on NIPA income and saving, these data series provide a more complete and often surprising analysis of recent decades' increased wealth concentration and its sources, notably the significance of accrued capital-gains property income in that trend.

The Introduction in Section One presents a simplified explanation of the issues involved, and the data series provided. Section Two explores the history of Haig-Simons income accounting and literature, and its relationship to recent calls for integrated "3D" measures of income, consumption spending, saving, and wealth. Section Three presents the THIAs, and explains its key departures from NIPA-only accounting treatments. Section Four presents the THIAs' distributional breakouts of all measures, by income quintiles. Section Five displays the very different "story" of wealth concentration over recent decades that's made visible by the THIAs' balance-sheet-complete construction. Section Six concludes and makes suggestions for further research. The appendices address Haig-Simons income theory more deeply, provide a detailed explanation of the THIAs' construction and derivations, and offer insights and suggestions for improving the THIAs' distributional measures.

Section One: Introduction

A dominant economic fact of the past half century is the extreme and increasing concentration of U.S. wealth into the hands of ever-fewer people, families, and dynasties, and the corporations (including banks, insurers, major media companies, etc.) that they own as shareholders — with the accompanying concentration of both economic and political power, influence, and control. The post-1980 era has been a complete reversal of the unprecedented and epochal six-decade wealth dispersal from the 1930s to the late 1970s.[1]

The economics literature offers many explanations for that U-shaped development of wealth concentration, with many focusing on changes in income inequality, as variously

[1] Recent updates of that century-long "U-shaped" trend include Wolff 2024 in this journal, and Kuhn 2025. The authors offer an update of Saez and Zucman 2020 Figure 26 (which updates from 2016), with coverage 1917-2023: wealth-economics.com/S_Zucman_JEP_2000_rti_thru_2023.xlsx. See tabs Figure F1b and DataF1-F2(Wealth). Updated using data from Blanchet, Saez, and Zucman's realtimeinequality.org. Note that all three plotted wealth measures in this figure exclude durables holdings and federal-employee pension entitlements, so are comparable. (The unadjusted "raw" DFA wealth series, also provided in the SZ spreadsheet and updated in the linked spreadsheet here, includes those additional measures, and results in a notably smaller top-1% share.)

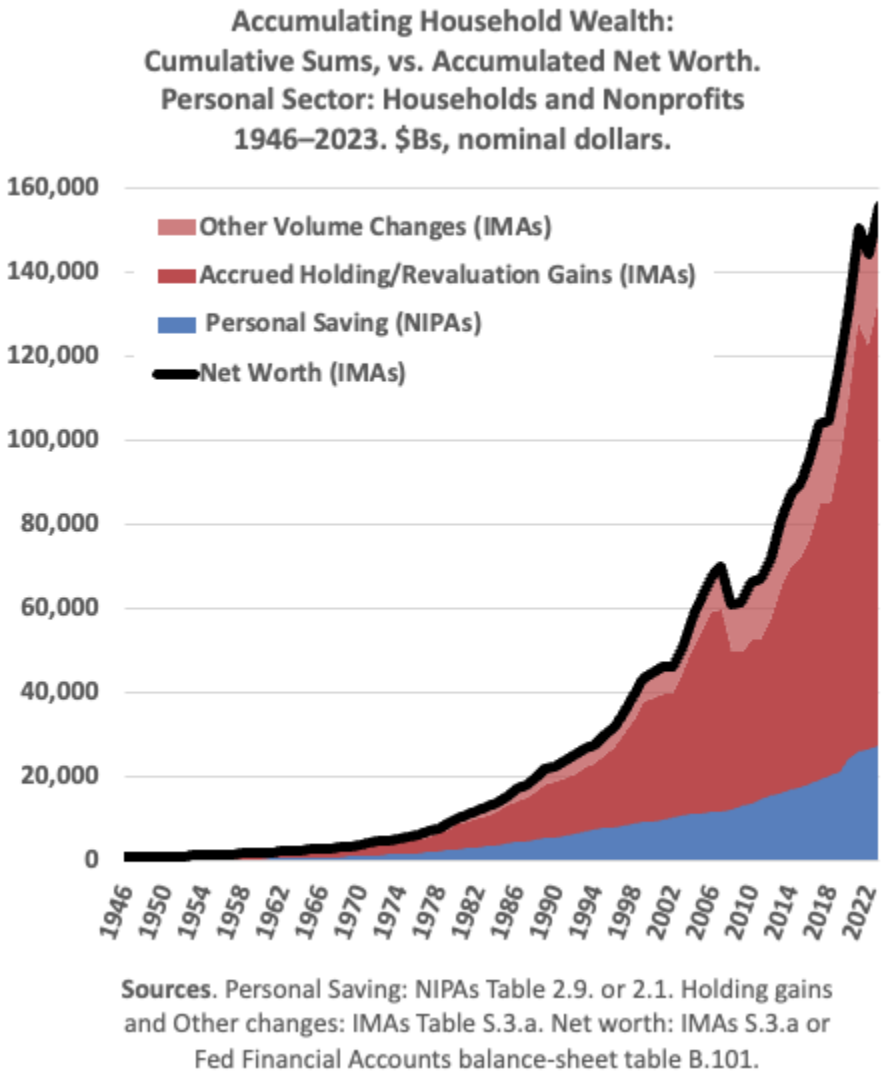
measured and conceptualized. But with some rare exceptions (*e.g.* Eisner 1989, Robbins 2018, Bricker et. al. 2020, Larrimore et. al, 2021), they all share one thing. They rest on a definition of "income" (in the NIPAs) that does not include households' total return on assets — total property income. In addition to the "yield" (interest and dividend) returns on assets tallied in the NIPAs, the Total Return measure necessarily includes holding (or "capital," or valuation) gains accrued and accumulated by households as wealth across years, decades, lifetimes, generations, and dynasties. The national accounts don't provide measures of such inclusive "Haig-Simons" income"[2] — which economists have referred to for many decades as the "preferred" income measure.

So, likewise, the NIPA household "saving" measure (the residual or remainder from NIPA income after subtracting taxes, consumption spending, etc.) fails to explain household wealth accumulation. Figure 1 shows that over time; cumulative NIPA saving is much smaller than change in net worth. If cumulative NIPA saving did represent households' total wealth accumulation (and their resulting "savings"[3]), households' 2023 net worth would be $29T — the blue area in Figure 1 — versus the observed measure of $155T (the black line).

[2] Haig-Simons income is typically defined as consumption spending plus change in net worth. As displayed in Figure 1 and discussed throughout this paper, that measure is equal to NIPA income plus accrued holding gains (and other volume changes). It is referred to as "Total income" herein.

[3] This plural "savings" usage, implying a stock measure as in the vernacular "your retirement savings," is widely used but is not a technical economic term of art. There is no measure labeled "savings" in any national accounts — only assets and net worth.

Figure 1. Sources of U.S. household-sector net worth accumulation. The red and pink sections comprise property income, return on asset holdings, that's not included in NIPA measures and that is necessary to explain total asset/net-worth accumulation.



Sources. Personal Saving: NIPAs Table 2.9. or 2.1. Holding gains and Other changes: IMAs Table S.3.a. Net worth: IMAs S.3.a or Fed Financial Accounts balance-sheet table B.101.

All of the income in the red and pink slices of Figure 1 is property income (*i.e.* not labor or transfer income), which is added to the yield-only property income tallied in the NIPAs. By these balance-sheet-complete measures, property income is a far more powerful component of wealth accumulation than in the NIPA equivalent. Likewise, property income is a much greater component of the past half-century's increasing wealth concentration.

The additional measures/data series necessary to assemble this complete accounting (the pink and especially the red area in Figure 1) have been available to researchers since the 2006 release of the Fed/BEA (SNA-based) Integrated Macroeconomic

Accounts, or IMAs.[4] They make it possible to assemble Haig-Simons income series, which in turn are necessary to calculate balance-sheet-complete wealth accumulation or "Haig-Simons Saving" (all three colored areas in Figure 1, combined). Those, in turn, are necessary to explain observed changes in wealth concentration (Figure 10).

US Household wealth-*distribution* tables were released in 2019 (the Fed's Distributional Financial Accounts or DFAs). These make it straightforward to allocate holding gains to different groups (broken out by wealth, income, etc.), based on each group's asset holdings — providing a key necessary component for *distributional* Haig-Simons income series. The development of distributional household (NIPA) income accounts (the DPIAs), plus long-standing consumption series from CEX, make it possible to assemble distributional Haig-Simons income and *saving* series explaining different income groups' relative and absolute changes in wealth.

The THIAs thus provide aggregate household-sector Haig-Simons income, saving, and wealth-accumulation measures 1960–2023, as well as distributional Haig-Simons measures 2000–2023. See Figures 2 and 5. For reasons discussed below, the distributional measures must be considered as prototypes and proof of concept, but the top-20% and bottom-80% breakouts are quite solid.

All THIA measures are in nominal dollars ($Bs). Inflation-adjusted series are easily derived from these. These nominal series are of course not the only or final word on the issues addressed here. Household-size-equivalized income measures, for instance, offer a different and important analytical view. But the THIAs provide a stock-flow-consistent or -coherent (SFC) empirical accounting foundation that has previously been unavailable, and that other researchers may find valuable.

Section Two: Haig-Simons Income, Integration, and "Inequality in 3D"

Haig-Simons Income has a long history.[5] For decades, economists studying income, wealth and inequality have referred to it as the "preferred" income measure, and expressed wishes for a published Haig-Simons data series, as two recent research teams note:

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[4] Despite the unique and important measures introduced in the IMAs, they have been little-used in research and are rarely mentioned over the past decade. An IDEAS/RePEc search for the term since 2015, for instance, yields only eleven results. The BEA has stopped publishing the IMAs on its site "due to budget constraints," though the tables and data series are still published at the end of the Fed's quarterly Z.1 report (as the "S" tables, for SNA) and are still available on FRED. Even there, though, some aggregate IMA series have recently been labeled "discontinued" and are not updated on FRED (*e.g.* total nonfinancial assets), even though their component sub-measures (real-estate assets, durables, etc.) continue to be published and are easily summed to the aggregate measure. Perplexingly, these measures *are* still published in the Z.1 "S" tables.

[5] Robbins' footnote 7 nicely encapsulates Haig and Simons' definitions: "Haig (1921) wrote that income is 'the money value of the net accretion to one's economic power between two points of time', and Simons (1938) wrote that income is 'the algebraic sum of (1) the market value of the rights exercised in consumption and (2) the change in the value of the store of property rights between the beginning and end of the period in question.'"

> "The most comprehensive concept of income and consumption is drawn from the suggestions of Haig and Simons, where income represents the capacity to consume without drawing down net worth. Economists have used the following equation as the working definition of Haig-Simons: Income (Y) equals consumption (C) plus the change in net worth (∆NW). No studies use this definition to the fullest extent, because no household survey has the necessary variables to create a full measure of Haig-Simons income. (Fisher et. al. 2020 p. 7)

> "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. ... While the Haig-Simons approach is often considered the preferred measure by economists, actually estimating the distribution of accrued gains is necessarily imprecise because micro data rarely have all the information needed. (Auten 2022 p. 2)

Atkinson, Piketty, and Saez 2011 p. 34 likewise refers to "a 'preferred' definition of income, such as the Haig-Simons comprehensive definition, which includes such items as…accruing capital gains and losses." Saez and Zucman 2019 focus on this measure as well, though not by that name; they call it "true economic income."[6]

Earlier research on the topic is extensive and longstanding. Hicks 1946 (*Value and Capital*) is an important touchstone. It devotes a chapter to H-S income, though again not by that name (Chapter 14, "Income"). H-S income is necessary and inherent to Hicks' sustainable-consumption constraint (and Hyman Minsky's "survival constraint"): "the amount which [households] can consume without impoverishing themselves."[7] (Without running out of assets to spend, that is.) The 2008 SNA guide (p. 160) echoes Hicks' words almost verbatim.

The OECD (a) handbook (p. 29) discusses H-S income and concludes, "Although it is not part of the income definition as defined by the SNA, it would provide more insight into the economic situation of various household groups." As the THIAs demonstrate, it also provides a complete accounting explanation of household wealth accumulation, which in

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[6] Eight usages in the paper. One example, emphasis added: "As long as Bezos, Buffett, and Zuckerberg do not sell their stock, their realized income is going to be minuscule relative to their wealth and *true economic income*."

[7] Minsky/Simons: See Mehrling 1999, p. 139: "the most basic constraint on the behavior of every economic agent is the 'survival constraint' (Minsky, 1954, p.157) which requires that cash outflow not exceed cash inflow." The THIAs consider all assets, not just households' quite small (~10%) proportion of "cash" assets. See also Bezemer, 2021, p 391 ff, and Neilson, 2019, pp 45–49.

turn makes possible an accounting-complete understanding of differential, concentrated wealth accumulation (Section Five).

Previous efforts to assemble H-S income series include Eisner 1989, Robbins 2018, Bricker et. al. 2020, and Larrimore et. al, 2021. They use different methodologies and data sources so are difficult to compare or re-create, especially absent downloadable data sets, replication files, and detailed accounting derivations.

Economists' desire for such an integrated understanding, and acknowledgment of its ongoing absence or incompleteness, is epitomized most recently in the title of a 2024 report from The U.S. National Academies' Committee on National Statistics: *Creating an Integrated System of Data and Statistics on Household Income, Consumption, and Wealth: Time to Build* (Smeeding et. al. 2024). The envisioned system is rooted in a fundamental accounting identity (here simplified): Income minus Consumption Spending = Wealth Accumulation. I - C = ∆W. (Smeeding 2024, "Conclusion 2-1," p. 3, and pp. 65-66.) It's the "ICW" approach, nicely characterized in the title of Fisher 2021: "Inequality in 3D."[8]

The report's subtitle, "Time to build," is appropriate in view of the long buildout of fully accounting-integrated U.S. national accounts. In the late 1980s/early 1990s the Federal Reserve started developing annual balance sheets for the households & nonprofits (personal) sector and two other "real" sectors (not including financial institutions, government, or rest-of-world). Integrated SFC accounting (and understanding) is impossible without these balance sheets; they *are* the stock measures. The NIPAs, for instance, don't have balance sheets. The accounting identities for their flow measures terminate at Saving, a "dangling" measure; the NIPAs provide no accounting-identity relationship between that measure and (changes in) balance-sheet assets/net worth.[9] And as displayed in Figure 1, NIPA Saving does not equal the change in assets or net worth: I - C = S ≠ ∆W.

The major "integration" breakthrough came in 2006, when the Federal Reserve and the Bureau of Economic Analysis jointly started publishing the aptly titled *Integrated* Macroeconomic Accounts — the IMAs, based on and largely conforming to the U.N. System of National Accounts' (SNA, 2008) framework and requirements. The IMAs provide a fully integrated flows-and-stocks accounting table including balance sheets, for each domestic sector (notably the Personal sector, households plus nonprofits), plus rest-

[8] Garner et al (August 2023) Appendix B provides an excellent historical and international overview of that emerging "3D" approach, and the literature and research institutions engaging it.

[9] The Fed's Flow of Funds (FOF) Table F.6, "Derivation of Measures of Personal Saving," provides reconciliation of the measures of "Personal saving, FOF concept (FOF)," "Personal saving, NIPA concept (FOF)," and "Personal saving, NIPA concept (NIPA)," but it is a challenging construction even for national-accounting adepts. And it still does not consider or include the "missing" income and saving represented in the red and pink sections of Figure 1 or the "red box" highlighted in Figure 2.

of-world.[10] They also include clearly presented measures of sectors' accrued holding or (re)valuation gains broken out by asset class, and Other Volume changes, that are absent in the NIPAs. These additional measures and balance sheets make it possible to assemble total Haig-Simons income series as displayed in Figure 2.

The Smeeding report addresses the history and import of Haig-Simons income at multiple points, notably including (p. 33):

> "The critical factor in comparing trends in inequality across all three dimensions in a balanced way is to use the Haig-Simons budget identity to ensure that the definitions are consistent."

The report also mentions the IMAs (once, on p. 52): "Changes in wealth enter the national accounting via the Integrated Macroeconomic Accounts."

The THIAs incorporate both of these insights: they integrate the standard NIPA income accounting with the additional "changes in wealth" measures from the IMAs, to derive total Haig-Simons income. They then subtract "uses" (taxes, consumption spending, etc.) to derive Haig-Simons saving, which equals ΔNW.

Section Three: Total Household Income and Wealth Data, 1960-2023

The main contribution of this paper and the accompanying Excel workbook[11] is to provide an open-access data set based on Haig-Simons income (and saving) and its constituent components and derivations, for use by other researchers (Figure 2). It currently covers 64 years, 1960-2023. All THIA measures are for the households-only sector, excluding nonprofit institutions serving households (NPISHes).[12] All measures are in nominal dollars ($Bs); inflation-adjusted series are easily derived from these (see footnote 15).

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[10] Annual releases, with coverage from 1960. Quarterly tables, also back to 1960, were released in 2012. Coverage of Financial sub-sectors was also added in 2012, with balance sheet and revaluation measures back to 1960; coverage of financial subsector flow or "transaction" measures extends back to 2001.

[11] wealth-economics.com/THIAs_5.1.xlsx

[12] In 2019, national accountants "de-consolidated" the consolidated personal sector (often referred to in shorthand as the household sector) into its component sectors, households and NPISHes. See NIPA Table 2.9's separate measures: personal, household, and nonprofits (coverage back to 1992), the DPIAs (coverage from 2000), plus the FA balance-sheet tables B.101h and B.101.n and the households-only DFAs (coverage from 1989). Measures for earlier years are adjusted in the THIAs from the available personal-sector measures to households-only estimates as necessary, as explained in Appendix A and displayed in the spreadsheet itself. The choice of sector for the THIAs was driven by the DFAs' distributional-wealth tables, which only provide household (not personal-sector) measures. The THIAs' distributional results, discussed below, rely heavily on the DFAs' distributional balance-sheet measures, so the THIAs cannot currently be assembled for the personal sector.

Figure 2. The Total Household Income Accounts, detail displaying 2021-2023. Columns extend back to 1960. The red box highlights this paper's focus: income not included in NIPA measures of income or saving.

Total Household Income Accounts, Sources and Uses	2021	2022	2023	Sum 2000–23	% of Total income
Billions, nominal dollars. Household-only measures, ex-NPISH					
Start-of-period net worth	124,574	142,948	136,967		
Start-of-period assets	140,542	160,474	155,613		
Start-of-period liabilities	15,968	17,526	18,647		
Sources: Total income. Labor + total property + transfers	**37,312**	**15,021**	**32,657**	**424,357**	**100%**
Labor Compensation (earned income)	**12,557**	**13,437**	**14,190**	**216,412**	**51%**
Plus: Primary property income, return on assets ("yield")	**5,695**	**6,139**	**6,675**	**93,505**	**22%**
Proprietors' net income (profits)	1,815	1,874	1,949	30,006	7%
Rental net income (profits) including imputed owner-occupier rental profits	762	859	977	11,357	3%
Interest	1,458	1,611	1,864	30,827	7%
Dividends	1,660	1,795	1,885	21,316	5%
Equals: IMAs' "Primary" (market) income. Labor + primary property	18,252	19,575	20,865	309,918	73%
Plus: Additional property/ownership Income, return on assets	**15,940**	**-7,030**	**9,266**	**81,091**	**19%**
Other Changes in Volume	**18**	**-850**	**448**	**9,436**	**2.2%**
Accumulation of durable goods (net of consumption of fixed capital, durables)	475	368	330	5,285	1.2%
Disaster losses	-6	-16	14	27	0.0%
Other (other) volume changes	-450	-1,202	104	4,124	1.0%
Accrued holding or "capital" gains/asset (re)valuation	**15,922**	**-6,180**	**8,819**	**71,655**	**17%**
On financial assets	9607	-9605	7281	42,690	10%
On nonfinancial assets	6,315	3,425	1,537	28,965	7%
Memo: Total property income, Primary + Additional. Total return on assets	21,635	-891	15,941	174,596	41%
Equals: Total market income. Earned labor income + total property income.	**34,193**	**12,545**	**30,131**	**391,008**	**92%**
Plus: Net transfer income	**3,120**	**2,475**	**2,526**	**33,348**	**8%**
Gross social benefits and other transfers received	4,679	4,180	4,342	60,026	14%
Government social benefits	4,490	3,956	4,116	57,173	13%
From business (net)	58	89	85	739	0.2%
From nonprofits	132	135	141	2,113	0.5%
(Less) Household contributions for gov. social insurance	1,560	1,705	1,817	26,677	6%
Memo: Household income (labor + primary property + net transfers)	21,372	22,051	23,390	343,266	81%
Less: Uses	**18,939**	**21,002**	**21,875**	**317,863**	**75%**
Household Taxes	2,705	3,245	2,856	41,238	10%
Household Outlays	16,233	17,757	19,019	276,625	65%
Consumption expenditures	15,673	17,154	18,269	265,835	63%
Consumer (non-mortgage) Interest paid	278	334	493	6,425	1.5%
Adjustment for personal vs HH: net HH transfers to nonprofits	283	268	257	4,365	1.0%
Equals: Total saving. Change in net worth. Sources - uses.	**18,374**	**-5,981**	**10,782**	**106,494**	**25%**
Memo: Household saving (Household income - taxes - outlays)	2,434	1,049	1,516	25,403	6%
Plus: Assets accumulated from net new borrowing	1,557	1,121	501	12,726	3%
Equals: Change in assets	**19,931**	**-4,860**	**11,283**	**119,220**	**28%**
Minus: Liabilities accumulated from net new borrowing	1,557	1,121	501	12,726	**3%**
Equals: Change in net worth	**18,374**	**-5,981**	**10,782**	**106,494**	**25%**
End-of-period net worth	142,948	136,967	147,749		
End-of-period assets	160,474	155,613	166,896		
End-of-period liabilities	17,526	18,647	19,147		

81% of Total Income in the THIAs is NIPA Household Income. The red box in Figure 2 highlights Additional Property Income tallied from the IMAs (19%). That measure is dominated by accrued holding gains accumulated by households (17%), redounding to their balance sheets over years, decades, lifetimes, generations, and dynasties.

The THIAs' table structure is derived from and based on the IMAs' structure, with reorganization and re-labeling of measures in an effort to make the "integrated" sources, uses, and level changes, and their accounting-identity relationships, straightforwardly understandable to the general public or a typical businessperson, as well as academic researchers. The THIAs depart from the IMAs' structure by including Additional Property

Income in Total Property Income (and hence in Total income), consistent with the income definition in the academic literature on Haig-Simons income.

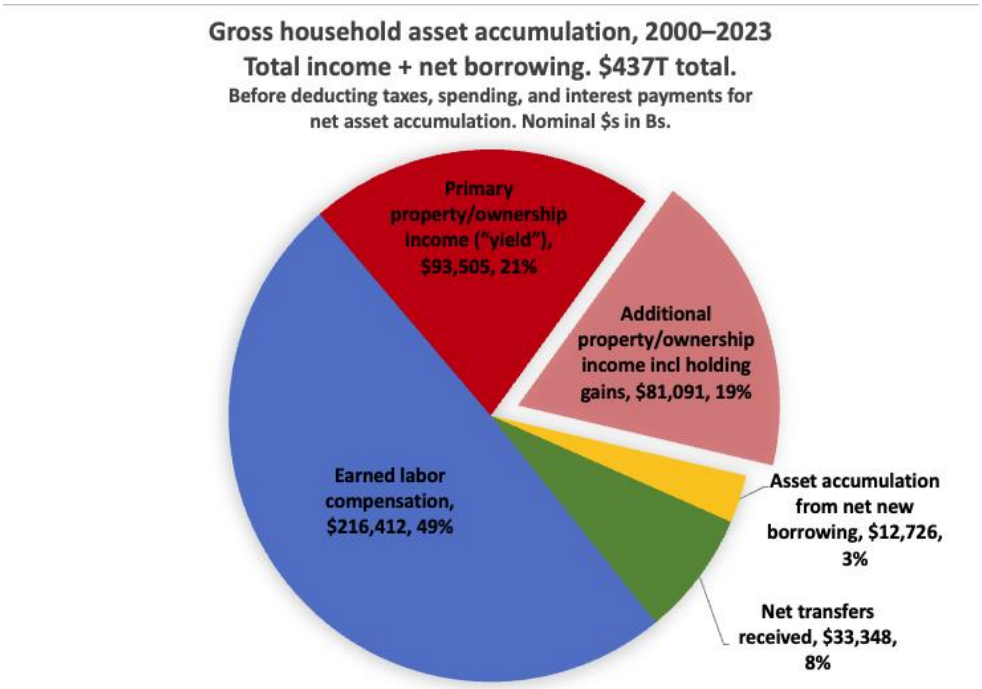
Total Property Income represents asset-holders' *total* returns on assets including holding gains — not just the "yield" from interest, dividends, etc. tallied in NIPA income. From 2000–2023, Additional Property Income comprises 46% of Total Property Income, return on assets, (of which holding gains are 41%) — vs. 54% from yield. With the inclusion of taxes, outlays (consumption spending and consumer-interest payments), and borrowing, the THIAs are balance-sheet-complete.

That feature makes it possible to cross-check and validate the THIAs' calculated, year-by-ensuing-year wealth changes and ending balance sheets (which are the starting balance sheets for the next year) against *observed* balance sheets from the Fed's Table B.101.h (which matches the DFA balance-sheet measures). Despite necessary THIA adjustments to account for household- vs personal-sector measures, the THIAs' end-of-2023 assets, calculated year by year over 64 years, match observed end-of-2023 household balance-sheet assets with a discrepancy of only 0.7%.

Figure 3 illustrates the sources of new household assets over 24 years. (It includes the relatively small quantity of new assets accumulated through borrowing, even though borrowing is not part of income.[13]) The detached pink pie-slice highlights the magnitude of Additional Property income that is not included in NIPA income or saving.

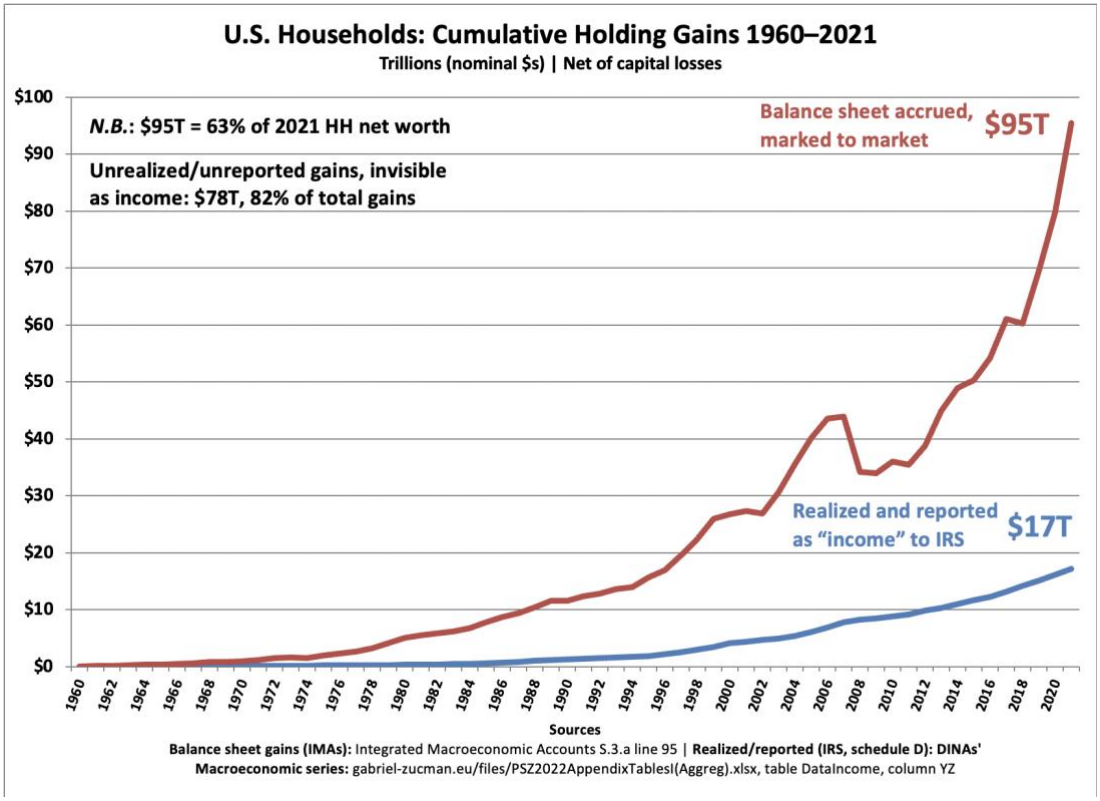
[13] The bottom rows of the THIA table, below Total Saving, tally households' balance-sheet changes due to *net* new borrowing — new borrowing minus loan payoffs. New borrowing adds assets and liabilities in equal measure, so it increases household assets but has no effect on net worth. It's "balance-sheet expansion," on both sides of the balance sheet.

Figure 3. Household-sector income and borrowing, including Additional Property/Ownership Income. The red and pink slices combined are total return on owners' assets, total property income.



Some widely-used data sets provide alternate measures of income that do include households' *realized* holding gains. (See discussion in Appendix A.) These measures cannot account for households' observed wealth accumulation because a large percentage of accrued holding gains are never "realized" or reported for tax purposes. (And likewise, they don't appear in the tax "administrative data" that constitutes an important basis for those data sets.) Figure 4 illustrates the magnitude of the gap between realized/reported gains and the accrued holding gains tallied in the IMAs. 82% of accrued holding gains are never realized and reported.

Figure 4. Household holding gains: realized and reported, versus accrued.



Accrued gains which are not realized nevertheless redound to household balance sheets as asset accumulation. Significantly, given holding gains' volatility (and thus their frequent treatment as "not real wealth" or "windfall" gains), over 62 years there has been only one significant drawdown in Figure 4's cumulative accrued series, in 2008: down $9.7T, a 13.7% decline.[14] Asset-holders recovered from that drawdown in only five years (in nominal terms).[15] Accrued holding gains are not just temporary up-and-down fluctuations.

[14] Given this rather large reality, it is worth revisiting the BEA FAQ, "Why do the NIPAs exclude capital gains from income and saving?" bea.gov/help/faq/67 Because asset prices are so volatile, the THIAs' total-income measures are not a useful measure of current, "this-period" production — the *ultima thule* of the GDP accounting construct. But they're arguably a valid market *correction* of firms' past production measures. In this logic, current asset markets think the country's unconsumed long-lived (productive) goods/"fixed capital" produced in the past (tangible and non-), are worth more, relative to their sales prices when they were produced, purchased, and posted as assets to balance sheets.

[15] To touch on inflation-adjustment: the CPI index increased by 82% from 2000 through 2023. (PCE index: 67%.) Market-price changes for households' assets, calculable in the THIAs, grew much faster. Nominal revaluation/holding gains over the same period were 129% of 2000 holdings for financial assets, 181% for nonfinancial assets, 146% for all assets combined. BEA Table 5.10 lines 54 ff (covering produced assets only, fixed assets and inventories), labels the first — nominal gains *attributable* to general inflation — as "neutral" nominal gains, and the remainder as "real" nominal gains. Table footnote 12: "Neutral holding gains are the gains derived from holding an asset if the price of an asset changed in the same proportion as the general price level. The chain-type price index for gross domestic purchases is used as a measure for the general price level."

Section Four: Distributional Wealth and Income Measures, 2000-2023

The THIAs also provide distributional breakouts for all of its income and outlay categories and subcategories, by income quintile, 2000-2023 (Figure 5).[16] These measures must be considered as prototypes and proofs of concept. The top-20% and bottom-80% breakouts cross-check very well against observed distributional balance sheets (DFAs), so this paper focuses on those measures. The lower quintiles are more problematic. The 24-year period 2000-2023 is also used frequently in this paper as a convenient sample of recent decades' aggregate and average measures and ratios.

Figure 5. A detail from the top of the THIA table (displayed columns are for 2019–2023) with Proprietors' and Rental income measures "expanded" to display the distributional breakouts by income quintile provided for all measures in the table. The "All HHs (cross check)" rows are an error-checking convenience for users who are revising or updating the table.

9	**Sources: Total income. Labor + Total return on assets + transfers**	**28,229**	**30,122**	**37,312**	**15,021**	**32,657**
17	**Labor Compensation (earned income)**	**11,447**	**11,596**	**12,557**	**13,437**	**14,190**
25	**Plus: Primary property income, return on assets ("yield")**	**5,127**	**5,179**	**5,695**	**6,139**	**6,675**
33	Proprietors' net income (profits)	1,556	1,594	1,815	1,874	1,949
34	*All HHs (cross check)*	*1,556*	*1,592*	*1,817*	*1,874*	*1,951*
35	Top 20%	1,379	1,439	1,653	1,685	1,729
36	60-80%	112	108	109	126	138
37	40-60%	47	37	40	47	57
38	20-40%	16	13	16	17	21
39	Bottom 20%	3	-5	-2	0	6
40	Bottom 80%	177	153	163	189	222
41	Rental net income (profits) including imputed owner-occupier rental profits	679	728	762	859	977
42	*All HHs (cross check)*	*679*	*727*	*763*	*859*	*977*
43	Top 20%	309	325	350	395	440
44	60-80%	136	152	156	171	197
45	40-60%	106	114	117	133	156
46	20-40%	85	89	90	105	123
47	Bottom 20%	43	47	50	55	61
48	Bottom 80%	370	403	413	464	537
49	Interest	1,578	1,487	1,458	1,611	1,864
57	Dividends	1,314	1,370	1,660	1,795	1,885
65	**Equals: Primary market income. Labor + primary property**	16,573	16,775	18,252	19,575	20,865

The THIAs' distributional breakouts are only possible because of major BEA and Fed data releases since 2019. In that year the Federal Reserve released the quarterly Distributional Financial Accounts (balance-sheet measures), with coverage back to 1989.[17] They provide distributional breakouts by income quintiles, and by wealth

[16] Income quintiles are used because they are directly provided by all the source data sets. They provide both a broader and more granular bottom-to-top view than in the DINAs, where both income- and wealth-percentile breakouts are given for the bottom 50%, next 40%, and above. The DFAs' *wealth*-percentile breakouts also use that form, but their income-percentile breakouts are by quintiles (plus top 1%). Both the DPIAs and CEX provide income decile/quintile breakouts. See Appendix C for discussion of income quintiles' comparability across sources. It would be preferable to analyze all of these breakouts by quintiles of Total Income instead, but the necessary quintile breakouts (household income and spending by Total Income quintiles) are not available from national agencies or private researchers. Current international efforts to assemble such breakouts will importantly contribute to the "integration" of distributional measures.

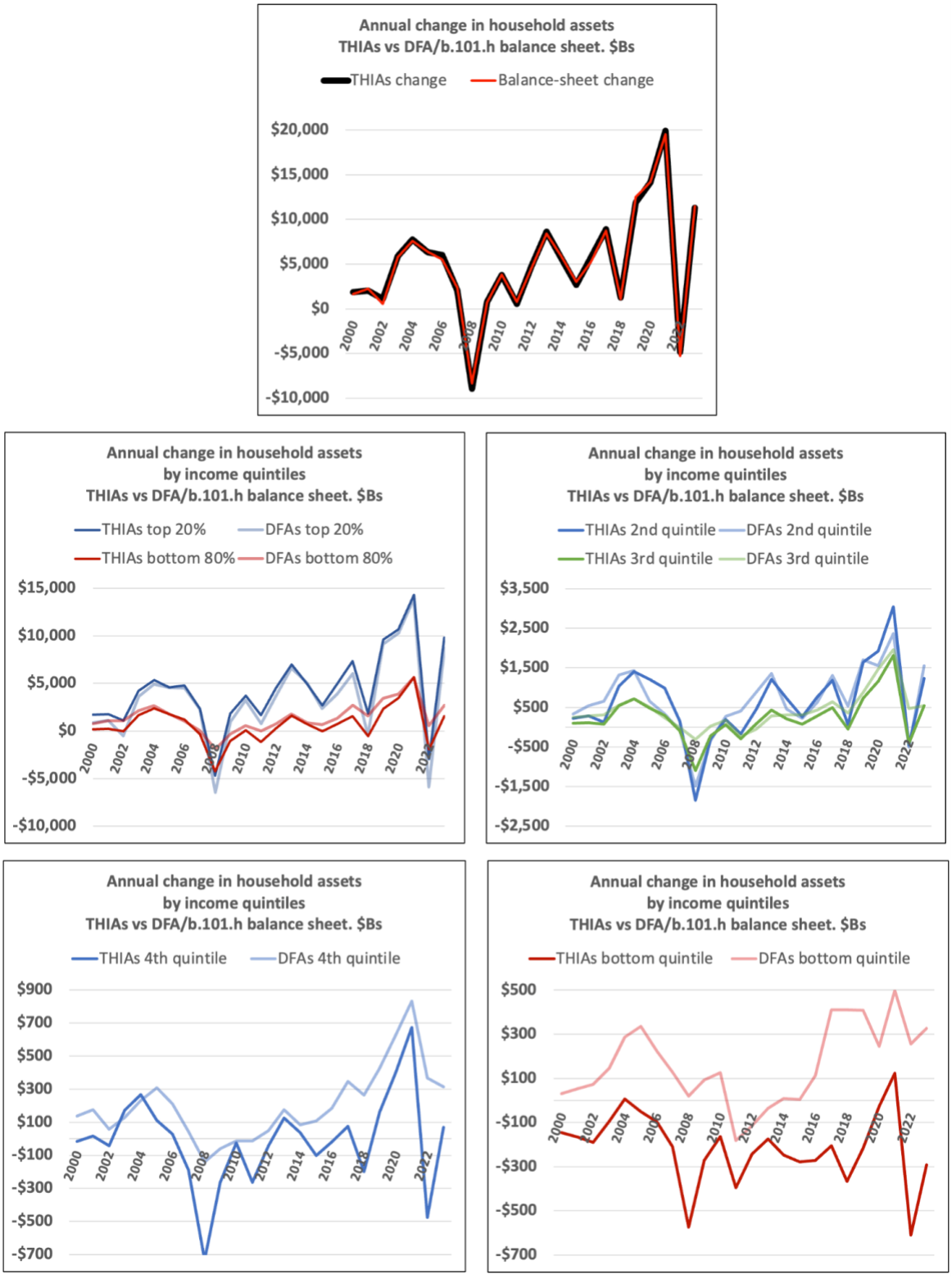
[17] The DFAs are household-sector accounts, excluding NPISHes. So in the same year, deconsolidated balance sheets were launched — FA Tables B.101.h and B.1010n — along with deconsolidated flow/transaction tables for the household and nonprofit sectors (NIPA Table 2.9). All these tables stand out for being very well integrated across agencies and approaches.

percentiles, plus age, generation, education, and race. The DFAs' income-quintile breakouts are what make it possible to allocate the IMA holding-gain measures across quintiles, and cross-check and validate the THIAs' distributional results against distributional balance sheets.

Given economists' longtime focus on income as opposed to wealth measures, it's surprising to find that the BEA's Distribution of Personal [and Household] Income Accounts were developed much later. The first prototype efforts covering a few years were released in December 2020, with annual improved and expanded December releases since then. Since 81% of the THIAs' Total income consists of NIPA household income, these DPIA breakouts were necessary to derive the THIAs' distributional results.

The THIA's balance-sheet-complete accounting again offers an important advantage: the calculated wealth changes *for each income quintile* can be cross-checked and validated against the DFAs' observed balance-sheet changes for each quintile (Figure 6).

Figure 6. The THIAs' calculated changes in quintiles' assets versus observed balance-sheet asset changes. Note graphs' Y-axis differences.



The THIAs' aggregate all-households measures match DFA measures quite closely. Lower quintiles show (much) greater discrepancies and annual variation. The bottom-

80% and top-20% series are quite solid, and thus are the main distributional measures examined in Section Five. Lower quintiles display larger discrepancies. The bottom-20% series, especially, shows large *qualitative* discrepancies, including persistent differences in sign. It's worth noting, however, that the bottom quintile's discrepancies are quite small in dollar terms (note the Y axis), relative to aggregates.

Even for the more-solid bottom-80 and top-20 series, some particular years show notable percentage discrepancies between the THIAs' calculated asset changes, and observed balance-sheet changes. These are especially notable in 2002, 2008, 2018 — years with large equity-market drawdowns, especially end-of-year, and in adjacent years.[18] One possible explanation for those discrepancies is the DFAs' necessary interpolation of SCF measures for years (and quarters) between the triennial SCF surveys, and extrapolation in recent years. Whatever the causes, the THIA (and DFA) series require careful use when examining periods shorter than five or ten years.

The THIAs' construction makes it possible for researchers to improve this prototype distributional effort by adding to or replacing any of the underlying data series with alternative series constructed from other data sources, or the same sources with alternative adjustments and/or quintile allocations. Some suggestions are discussed in Appendixes zz and zz.

Section Five. The Wealth-Concentration Story: Key Takeaways from the THIAs

The Total Haig-Simons income and saving measures in the THIAs paint a more integrated, complete, and sometimes quite surprising picture of U.S. inequality, and past decades' wealth accumulation and concentration. Total property income including holding gains figures much more prominently, with less focus on (smaller) changes in labor income. The focus in this section is on household *asset* accumulation. Liabilities only equal about 15% of household assets, and they change very slowly with net new borrowing. Over the period 2000 through 2023, borrowing has explained only 3% of gross asset accumulation (Figure 3).

Five key insights are highlighted here. First, the labor-income share of Total income is much smaller and has been declining faster than the labor share of Household income. Second, total income is much larger and total-income *growth* is much faster for the top 20% than for the bottom 80% — much more so than is true for household income growth. Third, the top quintile is turning over/depleting less of its income and assets in spending each year, compared to the bottom 80%. Fourth, the bottom-80's household saving is persistently negative, but its total saving is positive due to additional asset accumulation from holding gains (plus borrowing, to a much lesser extent). Fifth, as a result of the preceding, 86% of the Total saving since 2000 redounded to the top 20%, and that quintile's share of total assets — wealth concentration — increased accordingly.

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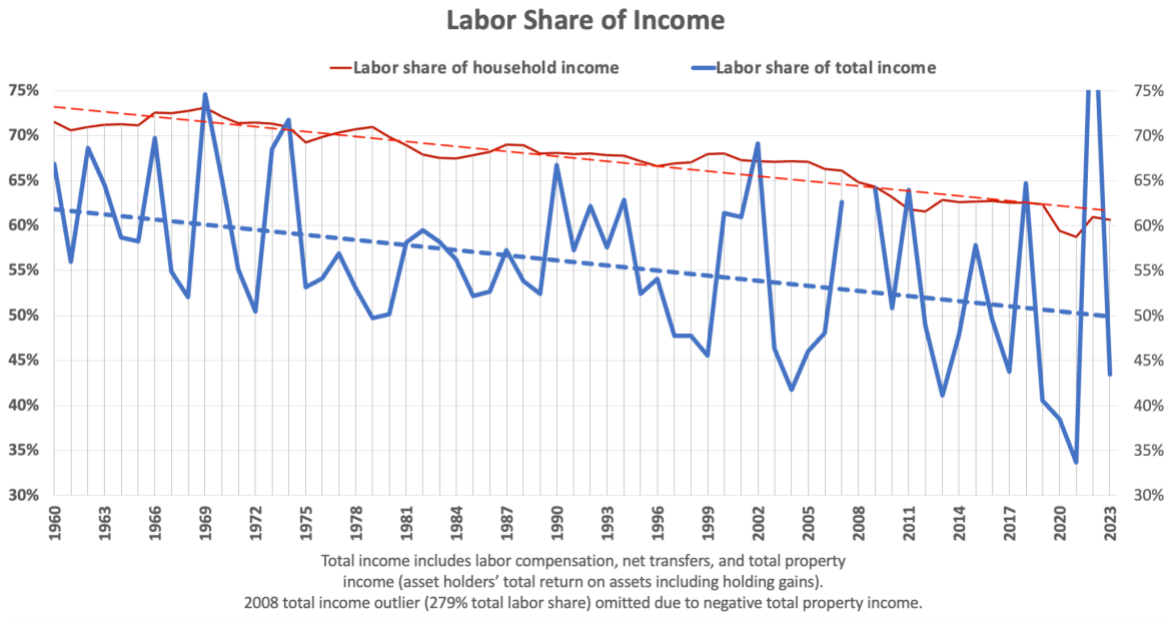
[18] Given the large equity drawdown in December 2018, this suggests inaccurate allocation of holding losses from that event to income quintiles. Late-2008 drawdowns were also largely in equity markets; real-estate declines spanned the period 2007 to 2011.

Labor shares of income. Labor's share of Total income is much smaller than its traditionally-measured share of Household income (Figure 7).[19, 20] The labor share of Total income also shows somewhat faster decline, from ~63% to ~50% over 64 years. During covid, labor's share of Total income dropped to as low as 34% (2021). But even in 2019 it had dropped to a record low of 40%.

Figure 7. Labor compensation as a percent of Household and Total income.



Workers are capturing an ever-smaller share of the Total household-sector wealth-accumulation "pie" over time, while asset holders are capturing bigger slices. The total income approach provides a much more complete and comprehensive answer to the question posed, for instance, in the title of Fixler (2019) : "How households share in an economy's growth" — which addresses Personal income only.

Unearned income. The obverse of earned labor income is unearned income, from property/ownership plus transfers. Unearned Household income is split 74%/26% between asset holders and transfer recipients. For unearned Total income, the split is 85%/15%.

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19 For comparison, The BLS "labor share of nonfarm business output" measure averages 59% over the period. The Penn World Tables' U.S. labor share of GDP averages 60%. These both reflect NIPA-style "national income"-based accounting, ex-holding gains.

20 Various accounting treatments quite reasonably try to re-allocate a portion of "mixed income" of "active" property owners and "proprietors" (variously defined) from property to labor income. See e.g. Saez and Zucman 2020: "We allocate 50% of partnership mixed income to capital (vs. 50% to labor) and 20% of sole proprietorship income to capital." These re-allocations to the labor income of owners *qua* working "entrepreneurs" only shift the aggregate labor share by one or two percentage points. The THIAs don't essay such adjustments, just relying on the NIPA labor-compensation measure and leaving adjustments to the discretion of individual researchers.

Income growth and distribution. Turning to distributional measures by income quintiles, total income is much greater than household income for all quintiles (Figure 8).[21] Household income *growth* was about the same for the top 20% and bottom 80%. Total income growth has been faster than for the Household measure, for both groups — but much more so for the top 20% (Table 2). The holding-gains portion of Total income has redounded to all quintiles, but especially to the top quintile that owns 85% of equity shares, 75% of financial assets, 54% of nonfinancial assets, and 68% of total assets.

Figure 8. Income quintiles' Total and Household income.

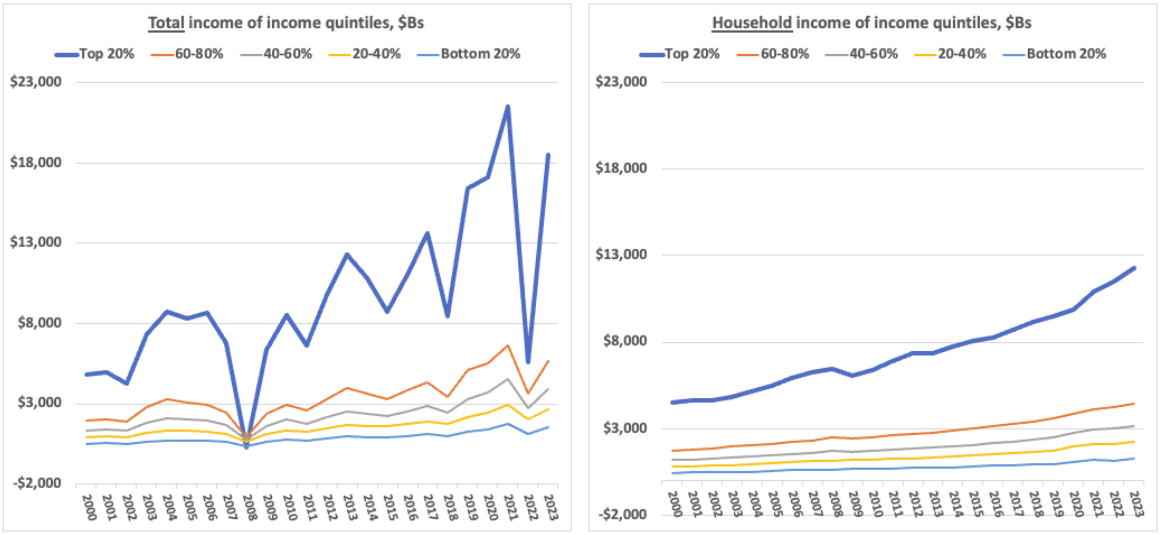


Table 1. The distribution of 2000-2023 income growth: Total income versus Household income. The red outlined cell highlights the most significant outlier in the table.

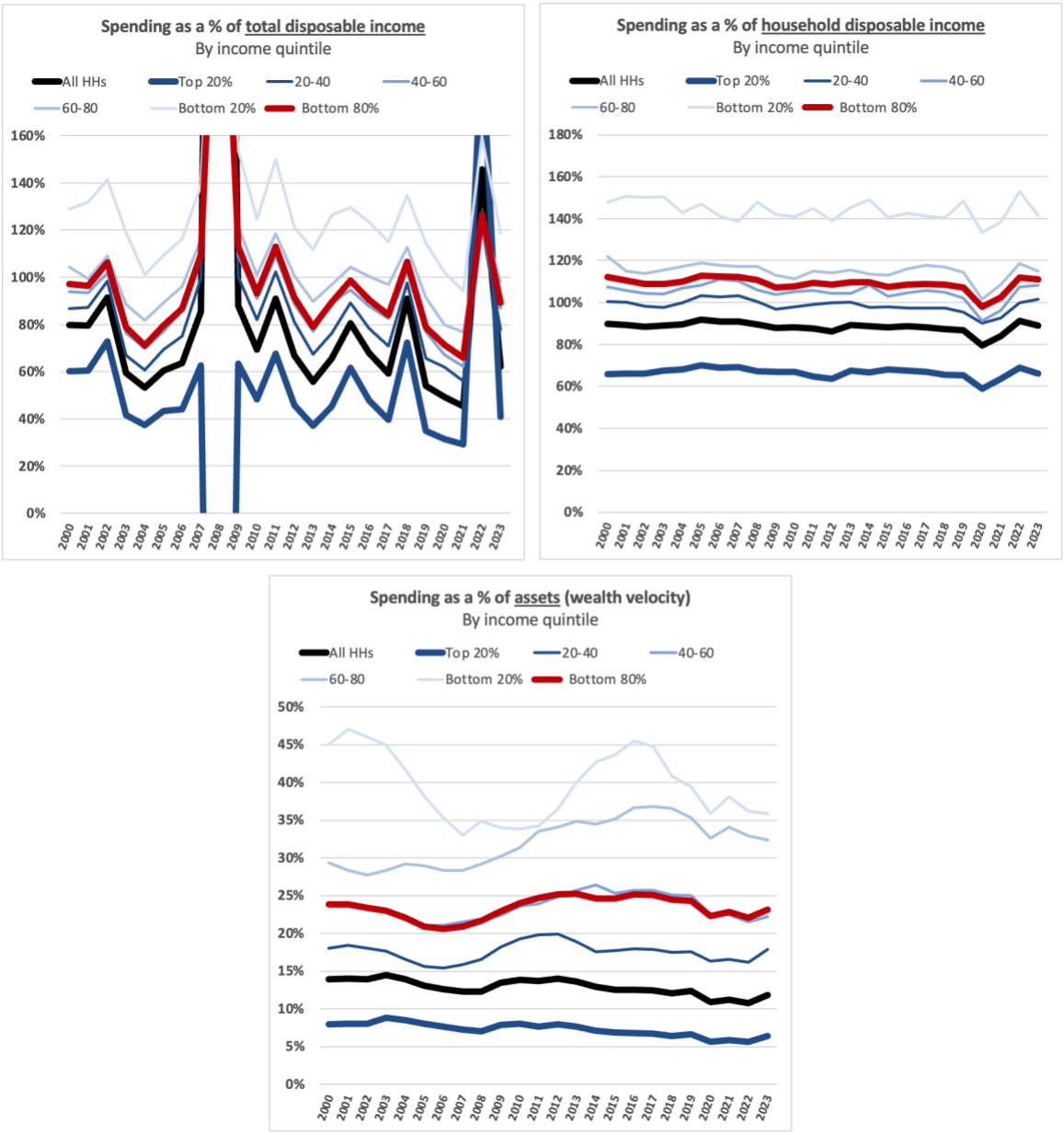
	Top 20%	Bottom 80%
Household income growth	+146%	+152%
Total income growth	+350%	+230%

Spending propensities. The THIAs' distributional spending breakouts also provide novel pictures of annual propensity-to-spend ratios (the inverse of propensity to save) relative to Household income, Total income, and total assets (Figure 9). While *marginal*-propensity equations and curves have been widely studied, the THIAs' annual distributional propensity-to-spend ratio data series have previously required bespoke construction by researchers.[22]

[21] Even the bottom quintile's total income is significantly higher than its household income, and the DFAs show even greater bottom-quintile net asset accumulation than the THIAs (Figure 6). So this result does not appear to be just an artifact of the THIAs' calculations.

[22] Fisher et. al. 2020 Table 1, for instance, constructed from the Panel Study of Income Dynamics (PSID) *en route* to calculating marginal propensities, derives annual propensity to consume/spend out of income in 1999 and 2013, for all income and wealth quintiles.

Figure 9. Income quintiles' propensity to spend: annual spending relative to income and wealth.



Households show declining propensities to spend over the period in all three ratios, especially relative to total income. Examining spending as a percent of assets ("wealth velocity"), the top 20% especially stands out; it only turned over 6% of its assets in spending in 2023, down from a series high of 9% in 2003/2004 — a 33% decline in that ratio. By contrast, the bottom-80% ratio was basically unchanged: about 23% for the

period, 4–6 times greater than the top 20% ratio.[23] Even as the top-20%'s total income share increased, it has been depleting its assets more slowly via spending.[24]

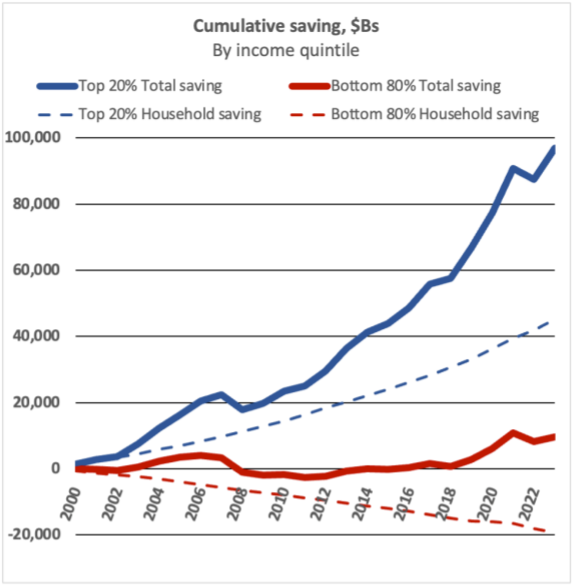
Saving and wealth accumulation. The increased total-income concentration detailed above, into more-concentrated property vs. labor income and into the top quintile, combined with declining top-20% spending propensity, explains the dominant stylized economic fact in the U.S. over recent decades that's highlighted in the first paragraph of the Introduction: extreme and increasing concentration of wealth into the top income (and wealth) percentiles (Figure 10).[25]

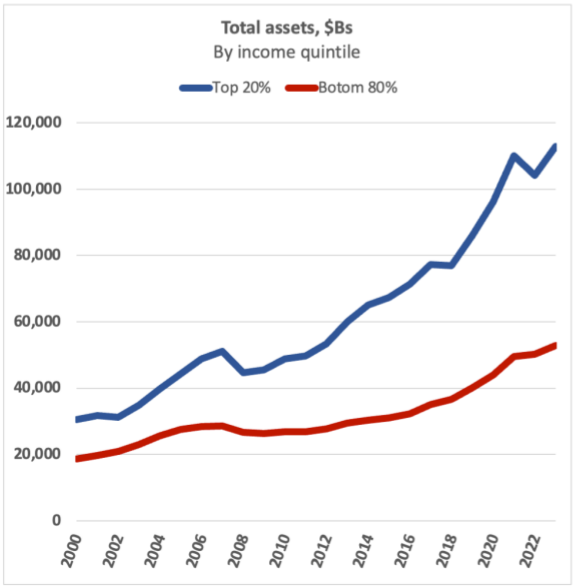
[23] Wealth velocity is the conceptual inverse of Piketty's wealth:national-income ratio, β. The fairly consistent wealth-velocity ratios across the period, with some trending, suggest that predictive growth models might benefit from including a wealth term in their consumption functions, combined with the traditional Keynesian income term. "Author" 2021b presents a long-term economic growth model calibrated based on income quintiles' historical wealth-velocity measures. (Wealth velocity is distinct from the "velocity of 'money,'" which only encompasses "M2": currency and deposit assets that comprise about 10% of household assets, 13% of financial assets.)

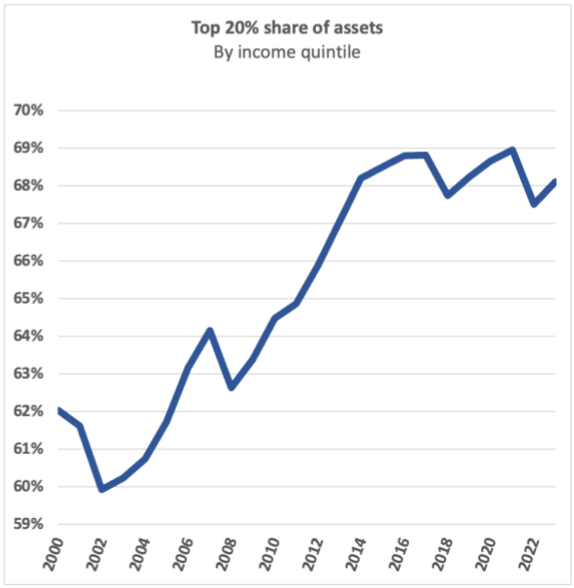
[24] Perhaps the most surprising result in dollar terms: the bottom 80% persistently spends more than its household disposable income, with a -8% average household saving rate. By that standard measure, the bottom 80% perennially dissaves*;* the top 20% does all the saving (see Figure 10). It seems these spending deficits should very quickly encounter a straightforward version of Minsky's survival constraint or Hicks' sustainable-consumption constraint: If a household spends down all its assets (so it has none), it can't spend (see footnote 7.). By contrast, the bottom 80% does *not* spend all of its *total* income; the household-saving deficit is "funded" primarily by lower quintiles' own holding gains. Borrowing provides additional funding, but the funding from gains is an order of magnitude larger ("Author" 2023).

[25] There has been much discussion and debate about "upper tail" income concentration, into the top 1% and above, notably of late between, Auten/Splinter, Smith et. al., and Piketty/Saez/Zucman. Auten/Splinter, for instance, incorporates realized gains (only), and concludes that their series demonstrates slower/smaller increases in wealth concentration vs PSZ. Larrimore et al. 2021 uses accrued gains, and finds that the top 1% share is several percentage points higher than Auten/Splinter. These top-tail share measures are quite large and so the discussions are important, but they encompass a small number of households and are extremely technical versus the THIAs' broader and better-sampled top-20% measures.

Figure 10. The distribution of saving and asset accumulation, and resulting asset shares. Household saving measures (dotted lines) shown for comparison.







Over 24 years, 86% of Total saving has redounded to the top quintile (which has more asset holders), so it has accumulated assets at a much higher rate than the bottom 80% (more workers and transfer recipients). Measures based only on NIPA household income or GNI, and their household- or national-saving remainders/residuals (dotted lines in Figure 10), cannot account for this observed rise in wealth and wealth concentration.

Section Six: Conclusion

The magnitude of the Total or Haig Simons-based income and saving measures detailed in the THIAs, extending to trillions of dollars in single years and even in single quarters, dwarfs widely employed “headline” measures that are based on Personal, Household,

National, or even just labor or wage income. The Total-income measures tell a multi-decadal story of household wealth accumulation and concentration that's much more dependent on property (and especially holding-gains) income, and that's not visible through the lens of NIPA income and saving measures. These Haig-Simons measures are also necessary to constructing stock-flow-consistent "integrated" or "3D" distributional views of income, consumption, and wealth.

Economists have expressed the desire for these "preferred" balance-sheet-complete Haig-Simons measures for decades, and the means to assemble them from the national accounts has been available since the mid 2000s. Releases of distributional measures starting in 2019 allow the THIAs to present breakouts of Total income and saving by income quintiles, presented in tractable form for use by other researchers. Those distributional breakouts could be expanded by researchers to encompass other distributional "dimensions" — wealth, age, education, race, etc. — for a more comprehensive set of "integrated" distributional accounts.

The THIAs' presentation in documented spreadsheet form makes all the accounting identities and derivations therein explicit and visible, allowing detailed critique and discussion by researchers. The spreadsheet itself constitutes a complete replication file, including the ability for researchers to update and revise the underlying data and derivations.

In an accounting sense, accrued capital gains are major drivers of the extreme wealth concentration in the U.S. economy over the last decades. These drivers have remained invisible so far in other available data sets. Wealth concentration needs to be analyzed in terms of institutional economics, political structures and social consequences (as in Cooper et al, 2013; Josofidis and Supic, 2016; Bezemer and Hudson, 2016; Medlen, 2007; Medlen and Chen, 2020; Matsumoto, 2020; Weller and Karaklic, 2022). Knowing the balance-sheet-complete income accounting that results in the growth and concentration of wealth is an important support for this research agenda.

Appendix A. Haig-Simons Income Theory

The accounting derivation of Haig-Simons (H-S) income is quite straightforward conceptually:

H-S income = Consumption expenditures + change in net worth
= Household income + accrued holding gains from asset-price (re)valuation changes

In practice, based on national accounts' methods and derivations, it's also necessary to add small "other changes in volume" measures along with holding gains, as the IMAs do, to match observed changes in balance-sheet assets and net worth. Subtracting taxes and outlays then yields "H-S saving," here called "Total" saving, which is equal to change in net worth. Table 2 explains the construction of H-S income starting from household income, with two different approaches to ordering and labeling.

Table 2: Two ways of presenting and labeling the Haig-Simons accounting construction (∆ = “change in”).

Household income + Accrued holding gains and other changes in volume = Total income, H-S income - Taxes and outlays = ∆ Net worth (total saving) + Assets accumulated from net new borrowing = ∆ Assets - Liabilities accumulated from net new borrowing = ∆ Net worth, Total saving	Household income + Accrued holding gains and other changes in volume = Total income, H-S income + Assets accumulated from net new borrowing = Gross asset accumulation - Taxes and outlays = Net asset accumulation, ∆ Assets - Liabilities accumulated from net new borrowing = ∆ Net worth, Total saving

Note: Outlays = Consumption expenditures plus consumer-interest payments

It is crucial to recognize that holding gains do not represent a transaction "flow" from any other sector. Unlike transactions that involve explicit transfers between accounts (credits and debits), the appreciation of asset-market prices does not generate corresponding liabilities on the balance sheets of households, of asset-issuers, or any other economic agents. Instead, these gains emerge through mark-to-market revaluations, asset markups, as recorded by brokerage firms and national accounting systems in response to observed changes in market prices. In the absence of new liabilities, such valuation gains contribute to *both* assets and net worth to households. (This stands in contrast to borrowing, which simultaneously increases both assets and liabilities, leaving net worth unchanged.) Consequently, holding gains/valuation changes are excluded from the Flow/Transaction tables in the Federal Reserve’s Flow of Funds accounts, as those tables solely capture “volume”-based “transactions.” Instead, such gains are systematically recorded in a separate (Re)valuation account within the (SNA-based) Integrated Macroeconomic Accounts (IMAs). See Figure 11.[26]

Whether some holding gains are “realized” by individual asset holders through sale is not material to the accrued Haig-Simons series. Those sales are just dollar-for-dollar asset

[26] In what might seem like a trivial terminology change, the Federal Reserve Flow of Funds/Z.1 report acknowledged this reality, explicitly adopting the SNAs’ volume vs. valuation distinction, with a change and explanatory note in the June, 2018 Z.1 release. (federalreserve.gov/releases/z1/20180607/html/introductory_text.htm). Emphasis added: “As of this publication, the term ‘flow’ is being replaced by the term ‘transactions.’ The concept being referred to, which is the acquisition of assets or incurrence of liabilities, is not being changed. The change in terminology is intended to prevent confusion with the broader concept sometimes called ‘economic flow,’ which is the *change in level* from one period to the next and is composed of *transactions*, *revaluations*, and *other changes in volume*. The new terminology brings the Financial Accounts of the United States into better alignment with international guidelines in the System of National Accounts 2008 (SNA2008).” (And thus the IMAs.) The Transactions tables are still labeled as the “F” tables, however: F.101 and etc.

swaps between asset-holders at current market prices — non-cash assets for cash assets. Those sales/swaps are "portfolio churn," with no effect on the individuals' or the aggregate current stock of assets.

Subtracting taxes and outlays from total H-S income yields total, comprehensive, or Haig-Simons saving, which equals change in balance-sheet net worth.[27] This total-income accounting offers a comprehensive post-facto, backward-looking descriptive accounting model of wealth accumulation, through the lens of the household-sector balance sheet that sits at the top of the national accounting-ownership pyramid.[28]

Like household income, national income — the core measure for the Distributional National Accounts and the World Inequality Database — does not include holding gains, realized or accrued. (The DINA tables do provide valuable series of realized holding gains, as employed in Figure 4, but only for the purpose of allocating, as opposed to measuring, national income.) National-income series are more internationally comparable, however, given the availability of national accounting measures across countries.

The THIAs are particular to the U.S., and are thus only a potential exemplar for other countries. But the SNA-based structure should be adaptable for details and particularities of other countries as SNA conventions and practices are more widely adopted — especially the clear distinction between volume and (re)valuation measures. To the extent that asset revaluation is measured, valuation and "other changes" measures can be added to existing personal/household income to assemble Haig-Simons total income.[29]

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[27] This accounting treatment comports with standard public-corporation financial statements, which include a Consolidated Statement of *Comprehensive* Income. These statements include net income (profits), equivalent to household or national income, and add additional income sources, notably holding gains. An example statement from Berkshire Hathaway is available at wealth-economics.com/BHCompInc.png.

[28] Household wealth is the operative measure of "national" wealth. The Household sector sits at the top of the national "accounting-ownership pyramid." In the words of the OECD DNA expert working group handbook (p. 29), "all forms of income in the economy eventually accrue to resident individuals." (In sectoral terms, households). Likewise, domestic firms' equity-share values at current asset-market prices are assets on the household-sector balance sheet. The household sector largely "owns" the firms sector in this accounting sense; the firms sector is like a wholly-owned accounting subsidiary. Firms can own shares in firms *ad infinitum*, but the household sector ultimately owns the whole firms sector; the ownership buck stops at households. This is an asymmetric, one-way ownership relationship. No other sector owns or can own (equity shares in) households — not since 1865. Likewise NPISHes, though for different reasons. Neither sector issues equity shares, or has owners. Similarly, the unmeasurable asset value of household-"owned" government assets (the judiciary system, public schools, roads and highways, *et. al.*) is at least partially *revealed* in the market value of household balance-sheet assets. That market value would presumably be somewhat smaller if those government "assets" didn't exist.

[29] The OECD DNA-EG handbook (OECD a, p. 29) envisions an accounting construction that fully integrates valuation changes, but only in the conditional or subjunctive mood: "[Holding gains are] included in the accumulation accounts in the framework of national accounts (see Figure 2.1) and could be taken into account once distributional information becomes available for the accumulation accounts. Although it is not part of the income definition as defined by the SNA, it would provide more insight into the economic situation of various household groups." The experimental "Distributional results on household income, consumption and savings" provided at OECD b do not include valuation measures. As this paper seeks to demonstrate, these valuation measures are extremely valuable even if distributional breakouts are not available. Lane 2015 also

Subject to available distributional breakdowns of household income and assets/liabilities, those revaluation measures can also be allocated to percentiles as in the THIAs, to assemble distributional total income series.

Appendix B. Constructing the THIAs

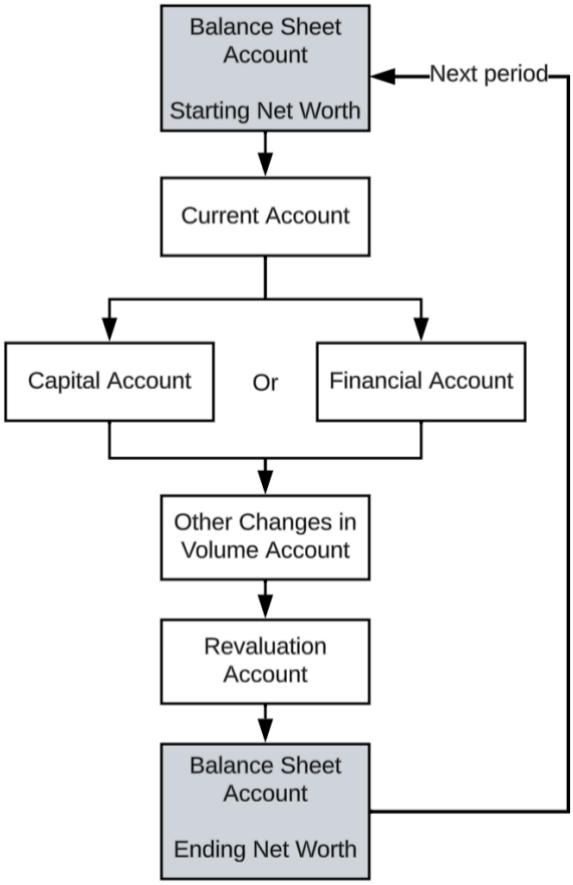
The THIAs' methodology in the accompanying Excel workbook serves as a complete replication file. This appendix takes the user step by step through the construction of the THIAs.

The most significant contribution is the THIAs' method for allocating holding gains to income quintiles (given holding gains' very large magnitude), which is straightforward and intuitive: holding gains are based on holdings, so they can be allocated to groups based on the groups' asset holdings (by asset category).

The basic THIA *structure* (Figure 2) is based on the IMA/SNAs' balance-sheet-complete presentation (Table S.3.a), and its derivation of change in net worth (line 96). Figure 11 diagrams its account structure, with alternate pathways through the Capital or Financial account. The THIAs do not engage with the Capital account, only the Financial account. That account comports with balance-sheet changes; the Capital account doesn't (hence the Statistical Discrepancy; see below). There is no engagement with value-added or investment spending (which is called "capital formation" in the IMAs). All of that is replaced with households-only income (and outlay) measures from NIPA Table 2.9 (since 1992), which matches the DPIAs (since 2000) — and pre-1992 from NIPA Table 2.1 (personal sector), adjusted for households-only as detailed below. These Household income measures comprise 81% of the THIAs' Total income.

brings H-S thinking to bear on the U.K. and other countries' current account balances (emphasis added): "*In principle*, the stock-flow adjustment term *should* reflect 'valuation effects' (net capital gains on holdings of foreign assets and foreign liabilities due to movements in the market values of assets and liabilities…)." Note that Net International Investment Positions (NIIP) *are* tallied using assets' current market prices.

Figure 11. The IMAs' account structure, with alternative Capital and Financial accounts.



The reference balance sheet since 1989 is households-only Table b.101.h, which is mirrored in the DFAs.[30] The THIAs' pre-1989 asset and liability measures adjust available personal-sector balance-sheet measures from B.101 down to households-only based on the average post-1989 household:personal ratio — 94.1% of personal-sector assets are held by the household sector, vs. 5.9% for NPISHes. (These ratios are very consistent over the years since 1989.) Net worth is of course assets minus liabilities.

Detailed Measures

Several of the detailed measures in the THIAs (which sum to the aggregate measures) require individual treatment, and/or adjustment to households-only in earlier years.

[30] The de-consolidation of the personal-sector balance-sheet table into B.101.h and B.101.n (since 1989) shows some anomalies. B.101.h assets + b.101.n assets, for instance, ≠ B.101 personal-sector assets. Part of this may just be because consolidation does not equal simple summing. But in any case deconsolidated NPISHes end up with some unexplained extra assets. See details and notes at the bottom of those B tables. The THIAs do not attempt to resolve those anomalies, which are very small relative to household assets; they simply employ the DFA/B.101.h measures.

Labor compensation and proprietors' income are both inherently households-only. The NIPA 2.1 personal and 2.9/DPIA households-only measures are equal. So pre-1992 measures from Table 2.1 require no correction.

Rental, interest, and dividend income. Post-1992 Table 2.9 household measures are 2.2% lower than Table 2.1 personal measures. Pre-1992 personal-sector measures are adjusted down accordingly to estimate households-only measures.

Other changes in volume. All of the Other changes measures come directly from the IMAs' Other Changes in Volume account, personal-sector Table S.3.a. These quite small measures (2.5% of total income, combined) are all inherently households-only, requiring no adjustment. They are allocated to quintiles starting in 1989 as detailed below.

Net Accumulation of Consumer Durables. This measure — purchases of new durables less depreciation of existing durables — must be added to balance sheets because durables are an asset category thereon, so the period-to-period holdings changes must be accounted for. Consumption expenditures includes spending on durables (reducing household assets), but in the NIPAs the accumulated assets aren't added back to balance sheets (the NIPAs don't have balance sheets). The IMAs do so via the "Net investment in consumer durable goods" line in the Other Changes account, and the THIAs follow that practice. Durables accumulation is allocated to quintiles based on each quntile's share of durable holdings, from the DFAs.

Disaster losses. A small measure, zero in many years, this is allocated to quintiles based on their shares of real-estate assets.

Other (other) changes in volume. This measure includes "bad debts, accounting changes, data discontinuities," etc. (Teplin et. al. p. 6). The difficulties of pension-entitlement accounting figure significantly in this measure. It's allocated to quintiles based on their percent holding shares of total assets.

Statistical discrepancy. This measure is *not* included in the THIAs, even though it is included in the IMAs' Other volume measures. This is because it's the discrepancy between the Capital account and Financial account bottom lines, and the THIAs don't engage with the Capital account. Derivations all effectively pass through the Financial account (Figure 11), which comports with balance-sheet changes.[31]

Holding gains/asset (re)valuation. Holding gains total $72T over 24 years, 17% of total income for the period. The measures come from the IMAs' (personal-sector) Revaluation account, adjusted down to households-only based on the household sector's average share of personal-sector assets,1989-2021 (94.1%). This measure is quite consistent over that period.

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[31] The net-worth derivation in S.3.a line 96 includes the bottom-line Capital-account net lending/borrowing measure. If it used the Financial-account net lending/borrowing measure instead, it would not be necessary to include the statistical discrepancy in the Other changes account. The Capital account and its statistical discrepancy would effectively just be an addendum note in Table S.3.

Since holding gains are the result of holdings, they're allocated to quintiles based on quintiles' shares of asset holdings, from the DFAs. Different quintiles have quite different asset-portfolio mixes, however (most significantly, equity shares vs real-estate titles), so gains on financial and nonfinancial assets are allocated separately based on quintiles' holding shares of each asset category.[32] Some non-systematic testing suggests that the simple financial/nonfinancial split captures the large bulk of variance in percentage gains on assets across asset categories, but since holding gains comprise such a big share of total income, this topic merits further investigation.[33]

Transfers. There are numerous very small discrepancies for transfer submeasures between NIPA 2.1 and 2.9/DPIAs; no attempt is made to adjust for those. The THIAs use the Table 2.9/DPIA measures from 1992, and 2.1 measures in previous years. See also below, "Adjustment for personal vs HH: net HH transfers to nonprofits."

Taxes. This measure from the DPIAs/NIPAs is mostly household income taxes. (National accounts' treatments of property and sales taxes, and "taxes on production and imports," are too complex to detail here.) It is inherently households-only; there is no difference between NIPA 2.1 and 2.9/DPIA measures. The THIAs nevertheless use 2.9 household measures starting in 1992, and 2.1 personal measures pre-1992, for consistent treatment.

Consumption expenditures. These outlays comprise 63% of total income over 21 years, so they're quite significant to saving "remainder" measures, and net asset accumulation. NIPA 2.9 household consumption expenditures (HCE) is used starting 1992. In prior years, available PCE measures are adjusted down to households-only, based on the (quite consistent) average HCE/PCE ratio 1992-2021 (97.4%), from NIPA 2.9.

HCE is allocated to income quintiles starting in 1984, based on CEX quintiles' percent shares of spending.[34] But an adjustment is needed first. The CEX aggregate expenditure

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[32] It's tempting to break out gains on assets with more granularity than just financial/nonfinancial. But that immediately engages with the third-largest asset category in the DFAs: pension entitlements (a financial-asset subcategory), for which quintile allocation would be difficult. These measures can be and are variously estimated based on pensioners' tallied entitlements, on pension funds' funding/endowment changes, or even on projections of funds' future inflows. Discussions of those accounting choices continue among national accountants. (The DFAs recently changed its detailed asset categories for these assets. See the more-detailed asset and liability category breakouts in the dfa-income-levels-detail.csv and dfa-income-shares-detail.csv files, available in the "Full CSV" zip file download at federalreserve.gov/releases/z1/dataviz/dfa/.)

[33] There is some evidence that wealthier households garner higher total returns (which include holding gains) on their asset holdings than lower quintiles, even from the same asset types (Balloch, Kartashova, Xavier).

[34] CEX undercounts consumption spending relative to HCE by roughly 40% (so only its quintile percent-shares are used in the THIAs, to allocate total HCE to income quintiles), and arguably undercounts top-percentiles' spending by even more. But it's "the only dataset with comprehensive and detailed information on household expenditure and its components." (Attanasio 2016). See BEA, 2019. "Comparing expenditures from the Consumer Expenditure Survey with the Personal Consumer Expenditures: Results of the CE/PCE Concordance."

measures include households' social security and pension contributions, which are not consumption expenditures in any national-accounting treatment. The magnitude is significant, a quite consistent 10% of total CEX expenditures across the period. Those measures are subtracted from each quintile's expenditures before calculating CEX quintiles' percent shares of spending. Those adjusted CEX percent shares are then used to allocate NIPA HCE by quintile. See Appendix C for details of income-quintile construction/composition in CEX versus other data sources.

Consumer interest paid. This measure is inherently households-only; NIPA 2.1 personal measures match Table 2.9/DPIA household measures. The NIPA 2.9 data is nevertheless used starting 1992 for consistency; previous years are from 2.1. This measure is allocated to quintiles from 1989, based on quintiles' shares of non-mortgage debt outstanding, from the DFAs. (*N.B.* Mortgage interest is "pre-deducted" from income within the derivation of rental profits, for both actual household-sector landlords and imputed owner-occupied landlords "renting to themselves.")

Adjustment for personal vs HH: net HH transfers to nonprofits. This measure corrects for an accounting quirk in the deconsolidation of the personal sector into households and NPISH. In NIPA 2.9, NPISH-to-household transfers are included in household *income*, while household-to-NPISH transfers are tallied in household *outlays*. But the DPIAs don't tally outlays, and unlike household<->business transfers, these two gross flows are not netted out in the income section. The adjustment here adds households' *net* household transfers to NPISHes (net of NPISH transfers to households) to household outlays. This additional outlay equals ~1.0% of total income; it reduces saving, asset accumulation, and ending assets accordingly. The households-to-NPISH measure is only available from NIPA 2.9, so the adjustment is only made starting 1992. It is allocated to quintiles based on their shares of household income.

Assets/liabilities accumulated from net new borrowing. This is simply the annual change in households-only liabilities, taken directly (with quintile breakouts) from the DFAs.[35]

bls.gov/cex/cepceconcordance.htm Spreadsheet: "Summary comparison of aggregate Consumer Expenditures (CE) and Personal Consumption Expenditures (PCE)" bls.gov/cex/pce-compare-200916.xlsx. Sabelhaus, John et al., 2013. "Is the Consumer Expenditure Survey Representative by Income?" nber.org/papers/w19589 Bee, Adam, Bruce D. Meyer, and James X. Sullivan. "Micro and Macro Validation of the Consumer Expenditure Survey." 2012 conference.nber.org/confer/2011/CRIWf11/Bee_Meyer_Sullivan_March2012.pdf See also discussion of the new DPCEAs in Appendix C.

[35] Borrowing adds assets and liabilities to borrowers' balance sheets in equal measure, for net-zero effect on net worth; loan payoffs, the reverse. National-accounts measures of net household borrowing derive from changes in financial-account liabilities, not from transaction flows; the THIAs use the same method. There are no available measures of households' gross borrowing or loan payoffs. (Which would in any case face the difficulty of loan rollovers and refis; how much of a year's gross borrowing is actually "new" borrowing?)

Appendix C: Improving the THIAs' Distributional Measures

In a fully fleshed-out "integrated" distributional accounting system, distribution would be visible across multiple rankings and groupings — by income quintiles as in the THIAs, or for instance by wealth percentiles or age, race, and education groups as broken out in the DFAs. The THIAs use (personal/household) income-quintile ranking/breakouts because all the necessary data sets provide such breakouts. These breakouts deliver important insights and understandings, but could be viewed as a proof of concept for a much larger system and structure. This section describes ways that the income-quintile-based THIAs might be improved.

The THIA workbook is assembled so it's relatively straightforward to replace, adjust, or add to the currently employed data sources and series. This section addresses potentially large additions that seem likely to help explain the THIA's remaining distributional quintile discrepancies, especially for bottom quintiles. (See also the methodological income-quintile issues addressed in Appendix C).

Intrasectoral flows across income quintiles. The measures compiled in the THIAs all involve changes in total household-sector assets and liabilities. Transfers and shifts in assets across quintiles *within* the household sector are not considered. (The all-households sector aggregates for such asset shifts should sum to zero because all the changes are *between* quintiles within the sector.)

Gifts, bequests, and inheritances in particular may be considerable; administrative (tax-return) data on these transfers is quite limited and incomplete. A rough estimate based on census deaths by age and DFA wealth by age suggests the magnitudes are quite large, in the ballpark of $1.7T in 2018, for instance — circa 10% of personal income, annually.[36] (Transfers "down the quintiles" from these bequests may be limited, with quite high estimated ginis for transferred wealth. Nolan, Salas-Rojo, Morelli. See also Sabelhaus.)

Compositional changes. Households and individuals constantly shift between income quintiles. They may enter the top 20%, for instance, during their prime working years, and often exit that quintile on retirement — bringing their often-considerable assets with them. But the top-20% income "class" remains an object of analytical interest and import. To the extent that these compositional and asset moves are large and systematic in direction, they could appear as significant asset shifts for income quintiles over time. As with inheritance, there is limited data available on these effects.

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[36] Zucman p. 21 (citing Alvaredo et. al.) estimates that 55–65% of U.S. household wealth is inherited. Alvaredo et. al.: "There exists substantial uncertainty regarding the relative magnitude of inherited wealth and self-made wealth in aggregate wealth accumulation… The 1980s saw a famous controversy between Modigliani (a strong lifecycle advocate, who argued that the share of inherited wealth was as little as 20–30% of US aggregate wealth) and Kotlikoff–Summers (who instead argued that the inheritance share was as large as 80%, if not larger)." Alvaredo does not estimate annual inheritance flows for the U.S. because there's so little estate-tax data to work with. But its estimates of what it calls "moderate inheritance flows (between 5% and 10% of national income)" put a current estimate of $1.7T near the middle of the likely range. A ($20,000) proprietary private report from Cerulli Associates predicts ~$1.5T a year, 2023–2027.

Since many of these intrasectoral, cross-quintile asset movements are systematically age-related (and thus especially pertinent in the context of a lifetime income hypothesis), that adds age as an important fourth dimension to the three dimensions of income, spending, and wealth.[37]

Holding gains by asset class. Because different quintiles have quite different asset-portfolio mixes, the THIAs quintile-allocate holding gains separately for gains on financial and nonfinancial assets. A more granular breakdown of asset classes could potentially allocate gains to quintiles more accurately. Since holding gains comprise 17% of total income, the effects could be significant.

If time series of these additional and different measures could be assembled, they could be straightforwardly "bolted on" to the THIAs' accounting construct (perhaps with some adjustments or additions to the category and subcategory labels and presentation employed in Figure 2). They could potentially explain some portion of the remaining quintile discrepancies displayed in Figure 6.

Appendix D: Comparing the Sources' Distributional Quintiles

Note: To avoid confusing the THIA workbook, the figures in this appendix are assembled using a separate special-purpose workbook that employs the THIAs data, plus other data, but is arranged differently.

The THIAs' distributional breakouts by income quintile for 2000-2023 rely on income-quintile measures from multiple sources. This raises an important question: is the composition of those sources' income quintiles (roughly) equivalent? Do the income quintiles consist of households with the same range and distribution of incomes, etc.? Is it valid, for instance, to combine quintiles' household income shares based on the DPIAs' income quintiles, to consumption-spending shares based on CEX income quintiles?

In particular, might quintile mismatches help explain the THIA discrepancies for lower quintiles displayed in Figure 6? (There are no significant discrepancies to explain for aggregate, all-households measures; they match quite precisely over decades.)

This appendix does not attempt to answer this question comprehensively, which would require original analysis of all the sources' microdata composition, compared across multiple dimensions. Rather, it examines indicative evidence: if two sources' income quintiles show equal quintile shares of income or consumption spending, for instance, that indicates that the two sources' quintiles are at least functionally commensurate for those measures, and fit for the purposes served in the THIAs — allocating aggregate measures across income quintiles. This section examines quintiles as constructed in four

[37] Notable recent research efforts in this area include Morelli, Mian, Horioka, Gindelsky, and in particular Bauluz and Meyer (January 2024). Available age/income/wealth data series are broken out by somewhat arbitrary age groups roughly related to life "stages," as opposed to equal-sized age-percentile groups. (See age breakouts in the DFAs and CEX tables, for example.) Because of different age distributions in different populations, this can make age comparisons difficult to interpret and model in relation to income and wealth percentiles.

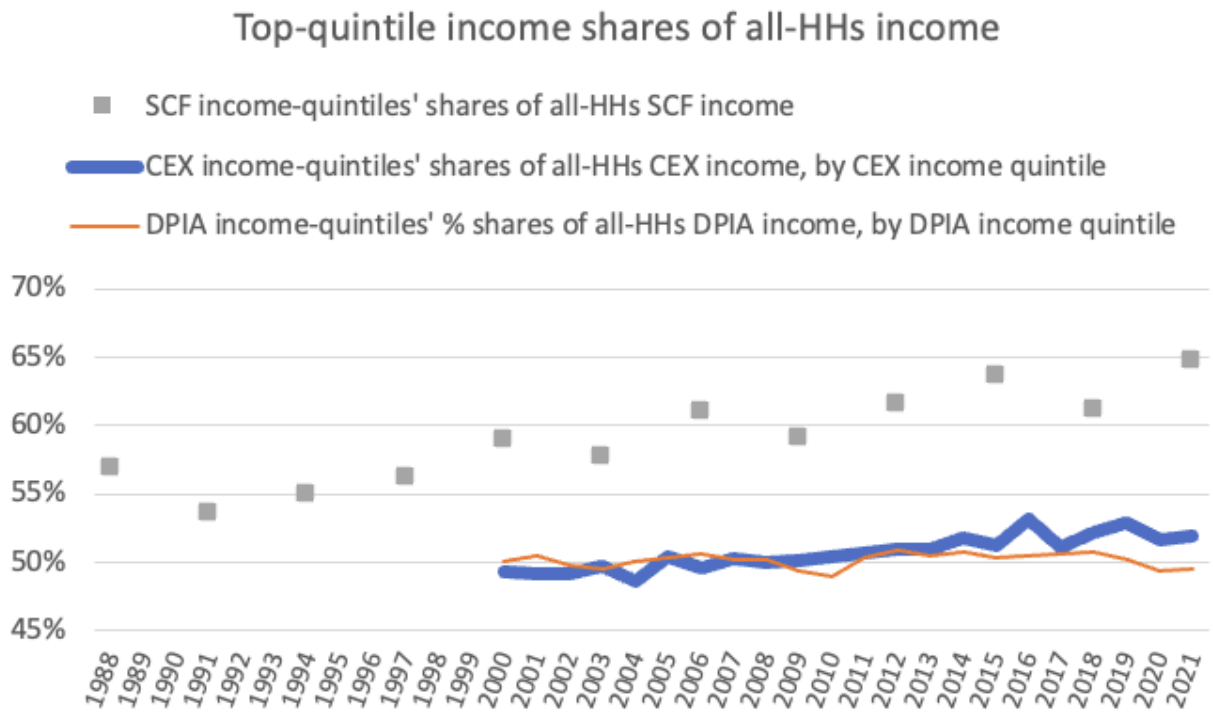
sources: the DPIAS, the SCF (and hence DFAS), CEX, and the new Distribution of Personal Consumption Expenditures Accounts or DPCEAs.

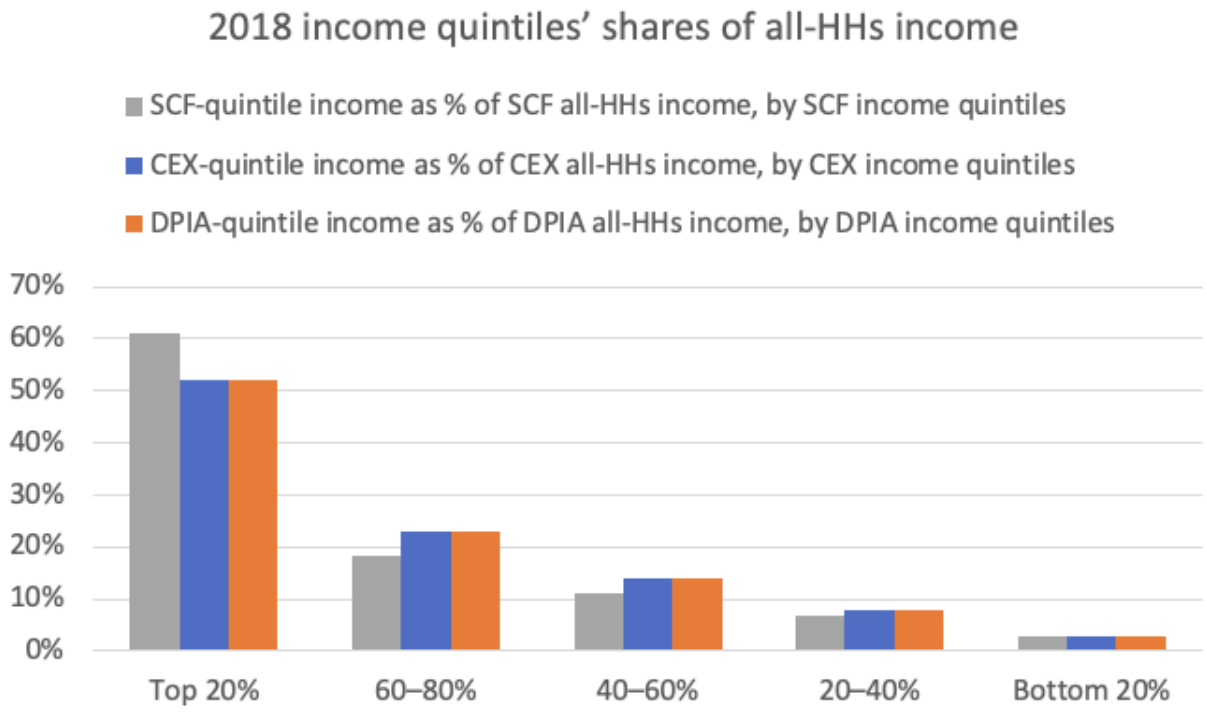
The THIAs take all their distributional household-income (and taxes) measures — 79% of total income — directly from the DPIAs. Notably, the DPIAs sort/rank households by their *household-size-equivalized* personal income (dividing each household's personal income by the square root of household members, for sorting purposes) before dividing the ranked households into equal-sized quintile groups. They then calculate (shares of) unequivalized NIPA personal/household income (and income subcategories) for those constructed quintile groups. The THIA household-income distributional measures come from, so necessarily match, the DPIAs'.

Household consumption expenditures (HCE) is another large measure in the THIAs — 61% of total income — and the THIAs rely on CEX-constructed income quintiles to allocate NIPA HCE to quintiles. To construct its quintiles, CEX ranks households by its own surveyed income measure (not equivalized), which is quite different from NIPA personal or household income.

Despite the differences between DPIA and CEX quintile treatments, their income-share results for quintiles are almost the same (Figure 12). The second graph displays (pre-covid) 2018 shares for all quintiles. (SCF is the anomalous series in this figure, and is discussed below.)

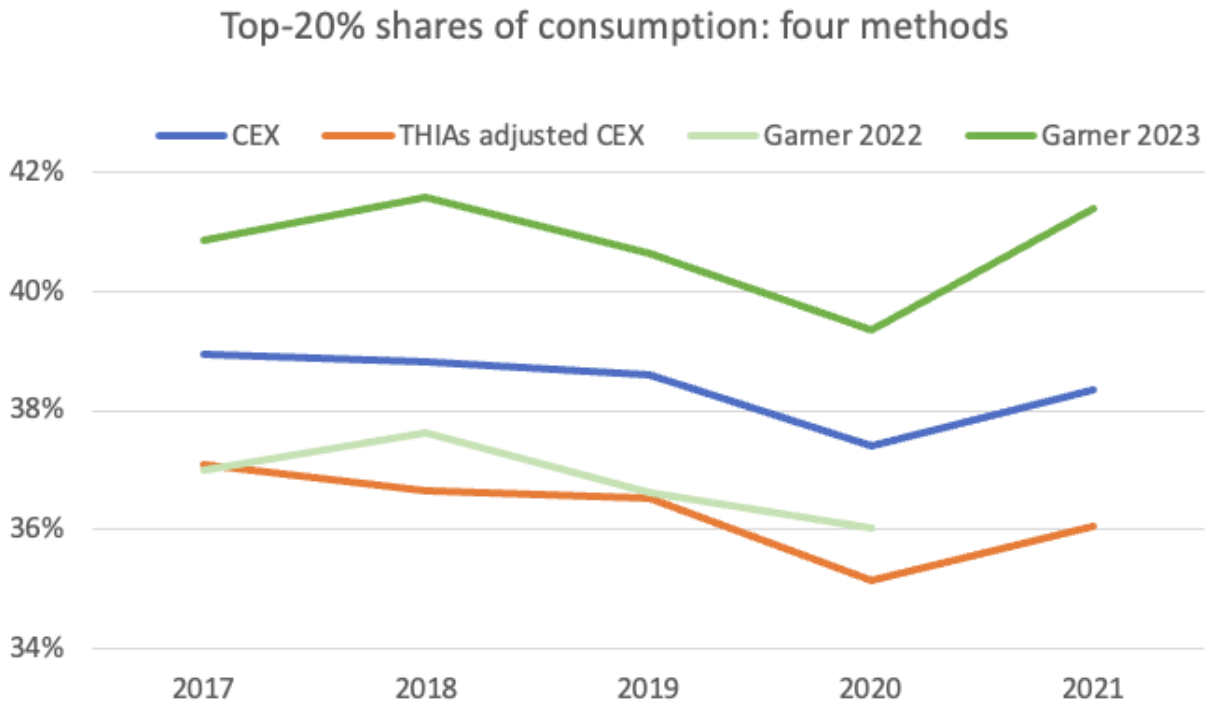
Figure 12. Comparing quintile's income shares from multiple income-quintile treatments.





The THIAs allocate HCE based on those CEX income-quintiles' shares of CEX spending. (After correcting for the CEX mistreatment of Social Security/pension contributions as "spending," as detailed in Appendix B.) CEX then calculates its quintile spending shares quite simply: total spending for a quintile, divided by all-households spending. (The THIAs correct the SS/pension problem for total spending prior to this step.) The resulting consumption spending shares can be compared to the DPCEAs' consumption shares. (Figure 13; top quintile only. Other quintiles' series are in the workbook.)

Figure 13. Top-quintile shares of consumption (spending) compared.



The DPCEAs (Garner et al 2023, and “Garner” in the graphs here) seek to serve a somewhat different purpose than other projects ("to provide a fuller picture of the well-being of households”), and they use a more complex construction. Firstly, they don’t construct income quintiles, but consumption quintiles, and they focus on (adjusted) consumption rather than consumption spending *per se*. This in itself renders the DPCEA results inapplicable to the THIAs, which are based on income quintiles. (Consumption distributions are more uniform, less concentrated at the top, than income distributions.) But the comparison still merits scrutiny. The DPCEAs further adjust and augment CEX categories and measures to make them more comparable to PCE’s categories, then sort/rank the resulting households by their household-size equivalized, and adjusted, consumption. So DPCEA quintiles are very different from others examined here — their purpose, construction, measures, and other methodology.

Despite all these differences, at least in the published 2022/23 first-year data, DPCEA quintiles’ shares of consumption were quite close to CEX-quintile shares, and almost identical to the THIAs’ SS-corrected CEX shares. The top-quintile share is much higher in the 2023 data, because in that year DPCEA top-5% (hence top-20%) consumption was adjusted upward using pareto adjustment “to mitigate understatement of inequality” arising from the CEX survey sample and etc.

Returning to the SCF income-shares series in Figure 12: these are significant for the THIAs’ distributional measures because the DFAs construct their income quintiles based on SCF income, and the THIAs use the DFA quintiles’ asset-holdings shares to quintile-allocate holding gains — 17% of total income. (Likewise some smaller Other changes measures.)

The DFAs may construct more income-concentrated quintiles than the other sources for two reasons:

1. For sorting/ranking purposes, the DFAs adjust the weights of SCF survey respondents to include the wealth of the Forbes 400, which is unsampled or poorly sampled in the SCF. Since Forbes wealth is big in individual terms but much less so as a percent of total wealth, this seems unlikely to explain (much of) the large income-share differences in Figure 6.

2. The DFAs rank households based on the SCF "Income" measure, which includes holding gains (and other unusual or one-off income) in a year. It also calculates the quintiles' shares of income based on that measure. (The SCF "Normal Income" measure — more equivalent to the DPIA/CEX measures that don't include holding gains — only includes the "Value of income the household would expect to receive in a 'normal' year.")

Whatever explains these income-quintile differences, it raises a conundrum in the THIAs. It results in *more* holding gains being allocated to the top quintile in the THIAs (and less to lower quintiles) than a less-concentrated distribution would. But Figure 6 shows exactly the opposite: according to the DFAs, lower quintiles net-accumulate *more* assets than is calculated in the THIAs. Further research is needed. Again, this is only pertinent to the distributional discrepancies; it has no effect on the THIAs' aggregate, all-households measures.

The comparisons in this appendix suggest that income-quintile methodology differences, different definitions of economic units and measures, and etc., are probably not a large contributor to the quintile discrepancies displayed in Figure 6. The large additional and different measures suggested in Appendix C seem to hold more promise in efforts to track down those discrepancies.

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