

Distributional Haig-Simons Income Accounts for U.S. Households, 2000-2019

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Online at https://mpra.ub.uni-muenchen.de/115948/ MPRA Paper No. 115948, posted 10 Jan 2023 14:19 UTC An Open-Access Data Series of Distributional Haig-Simons Income for U.S. Households, 2000-2020

This paper and the accompanying Excel workbook present the Distributional Comprehensive Household Income Accounts (DCHIAs), an open-access data series of comprehensive Haig-Simons income for U.S. households, 2000–2020, including all data sources and derivations. The series is derived from and comports with publicly available national-accounts data, and is balance-sheet-complete; it fully explains changes in household assets and net worth from year to year and across the 21-year period. A prototype distributional breakdown by income quintiles is provided for all measures and submeasures.

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Abbreviations used: <u>CEX</u>: Consumer Expenditure Survey. <u>DFA</u>: Distributional Financial Accounts. <u>DINA</u>: Distributional National Accounts. <u>DPIA</u>: Distribution of Personal Income accounts. <u>FA</u>: Federal Reserve Financial Accounts (F, L, and B tables). <u>IMA</u>: Integrated Macroeconomic Accounts. <u>NIPA</u>: National Income and Product Accounts. <u>SCF</u>: Survey of Consumer Finances. <u>SNA</u>: System of National Accounts.

Section One: Introducing the DCHIAs

Many U.S. income, wealth, and equality researchers and economic modelers over decades, and over recent years, have expressed wishes for a published data series of "comprehensive" Haig-Simons (H-S) household income that includes accrued holding gains as income. Comments from two recent papers serve as good examples:

"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 (Δ 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)

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. ... 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)

<u>Atkinson, Piketty, and Saez 2011</u> likewise refers to H-S as a "'preferred' definition of income." <u>Saez and Zucman 2019</u> focuses on this measure as well, though not by that name; they call it "true economic income."¹ Hicks 1946 discusses H-S income (again, not by that name) at chapter length.

The purpose of this paper and the <u>accompanying Excel workbook</u>² is to provide such a "preferred" and open-access time series (Figure 1). Each of the income and outlay categories and subcategories provides a prototype breakdown by income quintile (Figure 2). The workbook includes transparent derivations of all measures, including the complete public data sets from which they're derived, in a form that is relatively easy for researchers to alter and adapt. It's labeled here as the Distributional Comprehensive Household Income Accounts, DCHIAs for short. All DCHIA measures are in nominal dollars; inflation-adjusted series are easily derived from these.

Figure 1. The DCHIAs. Detail; columns extend back to 2000.

¹ Eight usages in the paper. One example: "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." <u>Roth 2021a</u> discusses Haig-Simons' historical "preferred" status at somewhat greater length.. ² wealth-economics.com/DCHIAs_2.5-Nov-1-2022.xlsx

Household Income Sources and Uses	2017	2018	2019	2020	Sum 2001–20	% of Compr. income
Billions, nominal dollars					2009-849-89-94 - 469-88-94	100.000 00.000
Sources: comprehensive Haig-Simons income						
Labor + property/ownership + transfers	23,968	17,107	28,170	31,163	341,701	100%
Labor Compensation (earned income)	10,424	10.958	11.448	11.593	176.227	52%
Plus: Primary property/ownership income	4 792	5 042	5 350	5 390	77 047	23%
Proprietors' net income (profits)	1,505	1 569	1 601	1 643	24 929	7%
Rental net income (profits)	641	670	688	709	8 782	3%
Interest	1 527	1 584	1 634	1 623	26 969	8%
Dividends	1,119	1,218	1,427	1,414	16,367	5%
Plus: Additional property/ownership Income	7,133	-565	9,589	11,426	63,204	18%
Other Changes in Volume	256	230	221	869	8,695	3%
Net accumulation of durable goods	236	265	256	337	4,244	1%
Misc: Disaster losses, pension & insur. adjustments	-59	-35	-35	-7	-323	0%
Other (other) volume changes	79	0	0	538	4,773	1%
Holding gains/asset (re)valuation	6,877	-795	9,368	10,558	54,509	16%
On financial assets	5,187	-2,177	7,968	7,719	36,747	11%
On nonfinancial assets	1,690	1,382	1,400	2,838	17,761	5%
Equals: Comprehensive market income	22,349	15,434	26,387	28,409	316,477	93%
Plus: Net Transfer income	1,619	1,672	1,783	2,754	25,223	7%
Gross social benefits and other transfers received	2,918	3,034	3,207	4,204	46,820	14%
Government social benefits	2,784	2,902	3,063	4,066	44,616	13%
From business (net)	29	22	31	18	506	0%
From nonprofit institutions (net)	105	110	113	120	1,698	0%
(Less) Household contributions for gov. social insurance	1,299	1,362	1,425	1,450	21,596	6%
Uses	15,574	16,301	16,931	16,637	258,455	76%
Personal Taxes	2,049	2,075	2,198	2,236	32,420	9%
Personal Outlays	13,525	14,226	14,733	14,400	226,035	66%
Personal Consumption Expenditures	13,234	13,905	14,393	14,116	220,719	65%
Personal (non-mortgage) Interest paid	292	321	340	284	5,317	2%
Sources minus uses, comprehensive saving (Δ NW)	8,394	806	11,239	14,526	83,245	24%
Plus: Assets accumulated from net new borrowing	534	468	491	624	9,784	3%
Equals: Change in assets	8.928	1,273	11,730	15.151	93.029	27%
Minus: Liabilities accumulated from net new borrowing	534	468	491	624	9.784	3%
Equals: Change in net worth	8,394	806	11,239	14,526	83,245	24%

Figure 2. Detail for illustration. DCHIA income-quintile breakouts for categories and subcategories.

Household Income Sources and Uses	2017	2018	2019	2020	Sum 2001–20	% of Compr. income
Billions, nominal dollars			100071100410			
Sources: comprehensive Haig-Simons income						
Labor + property/ownership + transfers	23,968	17,107	28,170	31,163	341,701	100%
All HHs (cross check)	23,968	17,105	28,162	31,164	341,709	
Top quintile	13,452	8,287	16,202	17,387	181,118	
Second quintile	4,551	3,546	5,211	5,908	68,280	
Third quintile	2,933	2,507	3,313	3,834	45,023	
Fourth quintile	1,939	1,778	2,183	2,553	30,454	
Bottom guintile	1,094	987	1,253	1,482	16,833	
Bottom 80%	10,516	8,818	11,961	13,776	160,591	
Labor Compensation (earned income)	10,424	10,958	11,448	11,593	176,227	52%
All HHs (cross check)	10.424	10.958	11.448	11.593	176.227	
Top quintile	5,184	5.497	5,743	5,743	86,605	
Second quintile	2,556	2.637	2,755	2.831	43,661	
Third quintile	1,513	1,578	1,648	1.689	25.704	
Fourth quintile	824	887	927	950	14,197	
Bottom quintile	347	359	375	380	6.060	
Bottom 80%	5.241	5.461	5,705	5.850	89,622	
Plus: Primary property/ownership income	4.792	5.042	5.350	5.390	77.047	23%
All HHs (cross check)	4,792	5.042	5.350	5,390	77.047	
Top quintile	3,548	3,707	3,946	3,954	56,819	
Second quintile	646	673	711	730	10,512	
Third quintile	346	376	395	398	5,684	
Fourth quintile	177	199	208	213	2,838	
Bottom quintile	75	86	89	94	1,193	
Bottom 80%	1,244	1,334	1,404	1,435	20,228	
Proprietors' net income (profits)	1,505	1,569	1,601	1,643	24,929	7%
All HHs (cross check)	1,505	1,569	1,601	1,643	24,929	
Top quintile	1,327	1,395	1,424	1,458	21,615	
Second quintile	121	117	119	124	2,165	
Third quintile	44	47	43	45	879	

This table presents a complete web of accounting identities. It's a superset of the commonly understood identities, which terminate with the saving remainder, or residual, not assets and net worth — the starting point for the next accounting period, in an ongoing closed loop. The Additional Property/Ownership Income category is the key addition; all other income is NIPA personal income. With the inclusion of household outlays (notably consumption spending), personal taxes, and borrowing, the DCHIAs are balance-sheet-complete. The accounted "economic flows"³ fully explain observed changes in household-sector balance-sheet wealth. This full accounting of the relationship between income, spending, and wealth may be valuable given the recent focus among inequality researchers on "joint distributions" of those measures.⁴ (The title of Fisher 2021 nicely encapsulates this approach: "Inequality in 3D.") It may also relieve researchers and modelers of the need to create bespoke Haig-Simons series from

³ For the Federal Reserve usage of the term "economic flow" and its relationship to volume vs. valuation measures, see Release Highlights in the <u>Q1 2018 Z.1 report</u>: "Flows' now referred to as 'transactions."

⁴ Garner et al (August 2022) Appendix B provides an excellent historical overview of that emerging "3D" approach, and the literature and research institutions engaging it.

household surveys and administrative data, which are unavoidably somewhat idiosyncratic so difficult to compare or re-create.⁵

All measures in the DCHIAs are distributed by income quintiles.⁶ (See Technical Appendices.) Income quintiles are used because they 1. provide a consistent basis for apples-to-apples accounting tallies, and 2. can be directly taken from, or reasonably assembled for, all the constituent data sets. That quintile breakout provides a broader view of inequality and the economy than the top-1%+/next 9%/next 40%/bottom 50% breakouts provided in the DINAs and other treatments, including more granular views of under-50% and under-90% households.

Section Two: Comprehensive Haig-Simons Income Accounting

Haig-Simons income is a quite straightforward derivation in its highest-level conceptual accounting-identity form:

1) Consumption expenditures + change in net worth

Which equals:

 "Primary" or personal income + accrued holding gains from asset-price/(re)valuation changes

In practice, based on national accounts' income derivations and methods, it's also necessary to add "other changes in volume" (see Technical Appendix A), and subtract taxes, for the summed economic flows to match changes in balance-sheet assets and net worth. In the SNAs' words (echoing Hicks), this total is "the maximum amount that a household or other unit can afford to spend on consumption goods or services during the accounting period without having to finance its expenditures by reducing its cash, by disposing of other financial or non-financial assets, or by increasing its liabilities."⁷

Rearrangement yields:

⁵ Larrimore et. al. 2021 and its predecessors, for instance, assemble H-S series from multiple microdata sets. Bricker et. al. 2020 constructs an H-S series from SCF microdata (their Figure 8). Those papers' H-S series (and their precise derivations) are unpublished.

⁶ The DCHIAs' sources do the heavy lifting of quintile allocation from survey microdata; their quintile-share results (percentage and/or dollar share estimates) are employed here. A statement in Fixler is *a propos*: "The validity of the estimates relies heavily on high quality microdata. Examples of such microdata are survey and administrative datasets produced and carefully compiled by the Census Bureau, the Internal Revenue Service (IRS), the Bureau of Labor Statistics (BLS), and other federal agencies. Although these datasets have shortcomings, such as representativeness at the top (or bottom), limited income variables, and inconsistencies, they are the best available microdata sources for annual income." See Technical Appendix B for discussion of potential mismatch between differently-constructed quintiles.

⁷ SNA handbook p. 160. Hicks p. 172: "the amount which [people] can consume without impoverishing themselves."

- 3) Primary/personal income
 - + Accrued holding gains (plus other volume changes)
 - Consumption spending and taxes
 - = Δ Net worth, wealth accumulation, comprehensive saving

Again this is simplified, but the point remains. Personal/primary income is a subset of comprehensive H-S income. H-S adds measures that (significantly) affect households' balance sheets. This yields a very different picture of "saving" (income minus outlays), and provides complete and coherent accounting of household wealth accumulation.⁸ It offers a comprehensive post-facto, backward-looking *descriptive* model of the economy, through the lens of the household sector that sits at the top of the national accounting-ownership pyramid.⁹

It's worth noting here that like personal income, gross national income (GNI) includes no holding gains, realized or accrued. The DINAs, whose core construction is designed to match GNI, likewise. To the extent that the DINAs also provide valuable series that do include holding gains (realized only), the measures are actually "departing the DINAs," and GNI. The implications for household wealth accumulation are quite large (Figure 3).

Figure 3. Cumulative accrued versus reported/realized household holding gains, 1960–2021.¹⁰

⁸ This accounting treatment is in keeping with standard (required) public-corporation financial statements, which include a Consolidated Statement of *Comprehensive* Income. These statements include net income (profits), comparable to household personal income or GNI, and add additional income sources, notably holding gains. An example statement from Berkshire Hathaway is available at <u>wealth-economics.com/BHCompInc.png</u>.

⁹ Almost all domestic firms' value at current asset-market prices is posted as assets on the household-sector balance sheet. The household sector largely "owns" the firms sector in this accounting sense; the firms sector is a wholly-owned subsidiary. Firms own shares in firms, but households ultimately own it all; the ownership buck stops at households. This is an asymmetric, one-way ownership relationship. Since 1865, no other sector owns or can own (equity shares in) households. Likewise NPISHes, for different reasons. Neither issues equity shares or has owners. Similarly, the unmeasurable asset value of household-"owned" government assets (the judiciary system, public schools, etc.) is at least *revealed* in the market value of household balance-sheet assets. The market value of households' financial and nonfinancial assets would presumably be somewhat smaller if those government institutions didn't exist.

¹⁰ Source: <u>wealth-economics.com/RealizedAccruedGains.xlsx</u>



82% of holding gains never appear as income, even in accounting treatments that include realized gains. Significantly, given holding gains' reputation for volatility (and thus their frequent dismissal as "not real wealth"), over six decades there has been only one significant drawdown in the cumulative accrued series, in 2008 (down \$9.7T, a 13.7% asset decline).¹¹

Section Three: Checking the DCHIAs

The DCHIA's balance-sheet-complete accounting offers an important advantage: the summed economic flows can be cross-checked and validated against observed balance-sheet changes (Figure 4). The aggregate derived measures match quite precisely; total discrepancies for changes in assets and net worth are only 0.4% over 21 years, with little annual variation.

The prototype quintile-distribution measures show more discrepancies and annual variation — moderate for the top-20% and bottom-80% series, but greater for the lower quintiles. The bottom-quintile series show large qualitative variation. It's worth noting, however, that the lower quintiles' dollar discrepancies are fairly small relative to aggregates.

Figure 4. DHCIAs' derived changes in assets versus DFA balance-sheet asset changes.

¹¹ Given this rather large reality, it is worth revisiting the BEA FAQ, "Why do the NIPAs exclude capital gains from income and saving?" <u>bea.gov/help/faq/67</u> Those gains are not a useful measure in tallying current production, but they're arguably a valid market *correction* of firms' past production measures, and their cumulative net investment ("capital formation" in the IMAs) and saving. Current asset markets think assets are worth more, relative to their sales prices when they were produced. In any case, holding gains can be and have long been viewed as a valid, pertinent, and even crucial component of current household income measures.



The DCHIAs' construction makes it possible for researchers to improve this first distributional effort by adding to or replacing any of the component data series with alternative series constructed from other data sources, or the same sources with alternative adjustments and/or quintile allocations. (And likewise, simply vetting for errors in the construction itself.) Some possibilities are discussed in Section Five and Technical Appendix B.

Section Four: Displaying the DCHIAs

The DCHIAs were originally conceived to provide previously unavailable data series for economic modelers. But the assembled "3D" data also provides measures and comparisons that paint a more integrated, complete, and sometimes surprising picture of U.S. inequality, and the economy overall. In particular, personal and comprehensive measures can be presented comparatively. This section provides examples; a huge range of presentations is possible.

Starting with the big picture of sources for household asset accumulation (from both income and borrowing, for a complete picture), the 21-year total is \$320T using comprehensive income. Absent holding gains and other volume changes, the total is \$268T, 16% less (Figure 5).



Figure 5. Sources of household asset accumulation (income plus net new borrowing).

Labor share is also quite different in the two treatments. 52% of comprehensive income goes to labor as earned income. Using non-comprehensive income, it's 62%. (For comparison, The BLS "labor share of nonfarm business output" measure <u>averages 59%</u> over the period. The <u>Penn</u> <u>World Tables' U.S. labor share of GDP</u> averages 60%.¹² These both reflect GNI-based accounting.)

¹² This BLS labor-share measure is generally only published (e.g. on FRED) as a labor-share index, or change in the index. Its actual labor-share percentages are occasionally published in reports and papers, e.g. <u>bls.gov/opub/ted/2017/labor-share-of-output-has-declined-since-1947.htm</u>. An equivalent measure is more regularly accessible from the Penn World Tables (University of Groningen) measures on FRED: <u>fred.stlouisfed.org/series/LABSHPUSA156NRUG</u>.

Splitting out just at unearned (nonlabor) income from those pies, we also see a quite different picture for comprehensive versus personal/primary income (Table 1).¹³

Table 1. Sources of unearned (nonlabor) income, shares of total

	From property/ownership	From transfers
Unearned comprehensive income	84%	16%
Unearned primary income	75%	25%

Comparing just income without borrowing, by quintile and year (Figure 6), we see a familiar divergence between top and bottom quintiles for both comprehensive and personal income. The proportional divergence looks larger for the personal income measure, though of course the dollar divergence is larger for comprehensive income.



Figure 6. Quintile breakouts of comprehensive vs personal income over time¹⁴

Quintile *shares* of comprehensive and personal income (Figure 7) look surprisingly similar, and steady, over the years, though with a more-visible increase in top-20% share of comprehensive income.

Figure 7. Quintiles' percent shares of comprehensive and personal income

¹³ Various treatments attempt to properly allocate "mixed income" to active property owners as labor income. See e.g. <u>Saez and Zucman 2020</u>: "We allocate 50% of partnership mixed income to capital (vs. 50% to labor) and 20% of sole proprietorship income to capital." But even at their most generous (to owners *qua* entrepreneurs), they only shift the aggregate labor share by a few percentage points. ¹⁴ Ideally or additionally, it would be valuable to display comprehensive income by quintiles of

comprehensive income. This would require assembling the DCHIAs from the ground up from microdata, after first adjusting income measures for economic units in all the contributing microdata sets to conform to regularized comprehensive-income (and household-unit) definitions by which units could be ranked.



Table 2 helps to interpret these somewhat hard-to-eyeball results. The standout figure in that table is the growth of top-quintile comprehensive income. This suggests that growth in holding gains (redounding mostly to the top income quintile, which holds 68% of assets per the DFAs) was a significant contributor to the two-decade runup in wealth concentration.

Table 2. Household income, increase from 2000 to 2020

	Top Quintile	Third Quintile	Bottom Quintile
Comprehensive income	3.7X	2.8X	2.9X
Personal Income	2.2X	2.4X	2.5X

The DCHIAs' series also make it straightforward to present income quintiles' annual propensities to spend, relative to (out of) different income and wealth measures (Figure 8). These basic economic data series have previously been unavailable to researchers and modelers, or have required bespoke construction.¹⁵

Figure 8. Personal-income quintiles' annual propensity to spend relative to income and wealth

¹⁵ <u>Fisher et. al. 2020</u> Table 1, for instance, constructed from the Panel Study of Income Dynamics (PSID) *en route* to calculating marginal propensities, finds an annual propensity to consume/spend out of income of less than one (<100%) in both 1999 and 2013 for all income *and wealth* quintiles.



The bottom 80% consistently (excluding 2020) spends more than its personal disposable income. (This spending deficit is dominated in dollar terms by bottom-20% deficits.) By that measure, the bottom-80% is perennially dissaving.¹⁶ Aggregate personal saving is purely a

¹⁶ It seems these deficits should very quickly encounter a straightforward version of Hyman Minsky's "survival constraint" (following Henry Simons), or John Hicks' sustainable-consumption constraint: "the amount which [people] can consume without impoverishing themselves." If a household has no assets, it can't spend. (Spending *is* transferring assets.) See also discussion of intrasectoral and compositional asset shifts in Section Five. Minsky/Simon: See <u>Bezemer</u>, and Neilson 45–49. Hicks: Chapter 14, "Income." See also <u>Mehrling 1999</u>, 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 treatment in the DCHIAs includes all assets, not just cash assets.)

result of saving by the top 20%. This is not true for spending relative to comprehensive income. All sectors except the bottom 20% spend less than their comprehensive income. Bottom-80 spending in excess of disposable personal income is "funded" partially by borrowing, but much more so by holding gains (Table 3).

Table 3. Bottom-80 net borrowing and holding gains as a percent of bottom-80 personal-saving deficits. Post-GFC, non-Covid years.

	2013	2014	2015	2016	2017	2018	2019
Net borrowing	2%	16%	24%	40%	45%	49%	40%
Holding gains	362%	214%	129%	214%	325%	7%	360%

Focusing on spending as a share of wealth, the top 20% only turned over 7% of its assets in spending in 2019 (5% in the anomalous year 2020), down from a series high of 9% in 2002. This compared to 27% turnover for the bottom 80%, and 40% for the bottom 40% — "wealth velocities" 4–6 times greater than the top 20%.¹⁷ Excepting the bottom 20%, these velocity measures are remarkably consistent over two decades.

Flipping the previous spending figure on its head, Figure 9 displays and compares personal versus comprehensive saving — disposable income - outlays.¹⁸ From that we can derive personal and comprehensive saving rates — (disposable income - outlays) / disposable income (Figure 10).

Figure 9. Personal and comprehensive household saving, by income quintile.

¹⁷ <u>Roth 2021b</u> presents a long-term economic growth model employing historical wealth-velocity measures.

¹⁸ Note that saving is not the exact obverse of spending. Personal saving = Disposable income - personal outlays. Personal outlays = PCE + personal (non-mortgage) interest paid. Personal interest, however, only comprises 2%–3% of personal outlays. <u>fred.stlouisfed.org/graph/?g=Xj4f</u> That small amount has even less import relative to the larger measures of comprehensive income.



Figure 10. Personal and comprehensive household saving rates, by income quintile.



Over 21 years, comprehensive saving is 4.2X personal saving (\$83T vs. \$20T). The comprehensive saving rate is 27%, versus 8% for personal saving. Both saving and saving rate, for both personal and comprehensive income, tell a similar (and familiar) story, of the top 20% dominating and pulling away from the lower quintiles — in dollar terms at least, quite rapidly and massively.

To complete this comparative picture, Figure 11 depicts quintiles' personal-tax burdens as a percent of personal, versus comprehensive income. The comprehensive tax rates are of course lower and much more volatile. Lower quintiles, which receive less of the additional ownership income included in the comprehensive income measure, don't show as much variance in rates between the two treatments.



Figure 11. Personal taxes a percent of personal versus comprehensive income

Overall, the magnitude of the comprehensive-income-based measures depicted in this section, extending to many tens of trillions of dollars, with much of that invisible in personal-income-based measures, dwarf changes in headline measures like labor compensation and net transfers over the same period. This may have important implications for tax and transfer policies. At least, these series may prove useful for economic modelers, especially longer-term modelers for whom the volatility of comprehensive income is less pertinent.

Section Five: Improving the DCHIAs

The DCHIA 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 remaining DCHIA quintile discrepancies. (See also the income-quintile issues addressed in Technical Appendix B).

Intrasectoral flows across income quintiles. The measures compiled in the DCHIAs 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 sector aggregates for these asset shifts should sum to zero, with all the changes between quintiles. Gifts and

inheritances in particular may be considerable. A back-of-the-envelope 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.¹⁹ (Transfers "down the quintiles" from these bequests may be limited, with quite high estimated ginis for transferred wealth. <u>Nolan</u>, <u>Salas-Rojo</u>, <u>Morelli</u>. See also <u>Sabelhaus</u>.)

Compositional changes. Households constantly shift between income quintiles, and their assets move with them. To the extent that these compositional moves are large and systematic in direction, they could appear as significant asset changes for income quintiles. (Again, the sector aggregates should sum to roughly zero.) Retirees, for instance, generally move into lower income quintiles, and bring their often-considerable assets along. Temporary unemployment moves households into lower quintiles, again with their assets; re-employment moves them back up. As with inheritance, there is limited data available on these effects. Since many of these compositional shifts are systematically age-related, that adds an important fourth dimension to the three dimensions of income, spending, and wealth.²⁰

If time series of these measures could be assembled, they could be straightforwardly "bolted on" to the accounting construct employed here. (Perhaps with some adjustments to categories and subcategories displayed in Figure 1.)

Technical Appendix A: Constructing the DCHIAs

The DCHIAs' precise methodology is revealed in the accompanying workbook. While it attempts to make the derivations as transparent as possible, it remains somewhat complex. This appendix seeks to explain the derivations in plain language.

The basic DCHIA structure (Figure 1) is based on the IMA/SNAs' balance-sheet-complete presentation (household Table <u>S.3.a</u>), and its derivation of change in net worth (line 95). The IMA Revaluation (holding gains) and Other Changes in Volume accounts are both presented within the DCHIAs' Additional Property/Ownership Income category

82% of the DCHIAs' comprehensive income measure is NIPA personal income. That measure and its submeasures (including personal taxes), all come directly from the DPIAs allocation to income deciles,. (Compiled into quintiles in the DCHIAs to comport with available CEX and DFA measures). The DCHIAs then add 1. additional property/ownership income, 2. personal outlays (mostly PCE spending), and 3. net new borrowing. Those added measures are sourced and

¹⁹ See <u>Alvaredo et. al. 2017</u>: "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)." That paper 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 \$1.7T near the middle of the likely range.

²⁰ Notable recent efforts in this area include <u>Morelli</u>, <u>Mian</u>, and <u>Gindelsky</u>.

allocated to income quintiles as described below. See Technical Appendix B for discussion of the income quintiles used to make those allocations.

Balance-sheet measures. The other necessary component is the balance sheet and its measures: assets, liabilities, and net worth — the benchmark against which the DCHIAs are cross-checked and validated. The Fed publishes multiple tallies of household or "national" wealth; they show some variance (Figure 12). With one exception, they all measure household wealth, as the top of the accounting-ownership pyramid (See Note 9).²¹ The DCHIAs' balance-sheet measures and changes, and their income-quintile allocations, come from the Distributional Financial Accounts, whose aggregate measures match those in FA Table b.101.h.



Figure 12. Federal Reserve measures of national and household wealth

Personal and disposable income. The DCHIAs are only (finally) possible thanks to the DPIAs, released in their third annual "prototype" version on Dec. 15, 2022.²² They're an annual series

²¹ Table B.1's "Derivation of U.S. Net *Wealth*" attempts to use an unusual alternate multi-sector methodology, somewhat inconsistently summing up "real," nonfinancial assets. This approach is not feasible and is not used for tallying either firms' or rest of world assets (current market-cap equity values are used for these), and the government "real-asset" measures are improbably small, excluding land holdings for instance. B.1's resulting aggregate measure is a bit lower than household net-worth measures, largely as a result of the total domestic sector's negative net international investment position (NIIP).

²² The importance of this effort and its rather glaring absence from official accounts over decades is exemplified in the extensive early work on the topic by Simon Kuznets, the primary creator of the national accounts. The last sustained and significant (but under-resourced and short-lived) official effort was in the

currently covering 2000–2020, which determines the DCHIAs' scope as well. Of the eighteen bottom-level income and outlay subcategories in the DCHIAs, ten come in directly from DPIA personal income and its submeasures (plus the measure of personal taxes, necessary for calculating disposable income). The DPIAs provide decile shares both by equivalised personal income, and by equivalised disposable income; they're nearly identical. The personal-income decile shares (compiled into quintiles) are used here.²³

The two other big measures included in the DCHIAs, and allocated to income quintiles, are revaluation/holding gains (16% of comprehensive income), and on the Uses side, personal consumption expenditures (65%). Those are addressed here first, followed by discussion of treatments for smaller measures.

Holding gains/asset (re)valuation. Holding gains comprise \$55T over 21 years, 16% of comprehensive income. The measures come from the IMAs' household Revaluation account, which include NPISH and "pure household" gains. To comport with the CEX, DPIA, and the DFA households-only measures, holding gains are adjusted down based on the pure household sector's share of combined-sector assets (94-95%).²⁴

Since holding gains are a function of holdings, they're allocated to quintiles based on each quintiles' shares of asset holdings, from the DFAs. (See discussion of the DFAs' income-quintile construction in Technical Appendix B.) Different quintiles have quite different asset portfolio mixes however (most significantly, equities vs real-estate titles), so gains on financial and nonfinancial assets are allocated separately based on quintiles' holding shares of each asset category. It's tempting to break out gains on assets with more granularity than just financial/nonfinancial. But that immediately engages with the third-largest subcategory of households' holdings in the DFAs: pension entitlements (a financial-asset category). They can be and are variously estimated in national accounts 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. (And the DFAs recently changed their detailed asset categories for these measures).²⁵

¹⁹⁵⁰s, 70 years ago, spearheaded by Selma Goldsmith

apps.bea.gov/scb/2021/06-june/0621-influencer-goldsmith.htm. (Distribution was "soft" or unimportant, woman's work?) She unfortunately died at age 50, and her research program along with her. Private work by Wolff, Atkinson, and others, plus the White House Office of Management and Budget (OMB), continued the effort intermittently, made consistent and ongoing by Piketty, Saez, Zucman, and co. (PSZ) in their DINAs. (As provided, those are not usable for the DCHIAs' construction because they don't provide allocations by income quintiles; they provide top 1% and above, next 9%, next 40%, and bottom 50%.)

²³ The DPIAs' detailed series are provided as 21 separate annual worksheets; the DCHIA workbook includes them and compiles their data into a single-spreadsheet data set. Data from that set can in turn be extracted, filtered, aggregated, and presented in many different tabular forms using pivot tables. (See the DPIA Data and DPIA Pivot tabs in the workbook.)

This percentage is derived from FA balance-sheet tables <u>B.101.h</u> (households), <u>B.101.n</u> (nonprofits), and <u>B.101</u> (combined sector).

²⁵ The DFAs' more-detailed asset and liability category breakouts are available in the dfa-income-levels-detail.csv and dfa-income-shares-detail.csv files, available in the "Full CSV" zip file download at <u>federalreserve.gov/releases/z1/dataviz/dfa/</u>.

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 this topic merits further investigation.

There is some evidence that wealthier households garner higher total returns (which include holding gains) on their holdings than lower quintiles, even from the same asset types (<u>Balloch</u>, <u>Kartashova</u>, <u>Xavier</u>). But somewhat paradoxically, the DCHIAs find greater balance-sheet asset increases than predicted by summed economic flows in the bottom quintile(s) especially, not the top. This also bears further examination.

Personal consumption expenditures. This is the standard NIPA measure. It comprises 65% of comprehensive income and 79% of personal income over 21 years, so it's quite significant to quintiles' saving "remainder" measures, and asset and net worth changes. PCE is allocated to quintiles based on quintiles' percent shares of spending, from CEX.^{26,27}

Before calculating quintiles' percent shares of expenditures, however, an adjustment is needed. The CEX expenditure measures include households' social security and pension contributions, which are not consumption expenditures in any other national-accounting treatment.²⁸ The magnitude is significant, circa \$1T in recent years, a quite consistent 10% of total CEX expenditures across the period. Those measures are subtracted from each quintile's expenditures before calculating quintile shares.

After this adjustment, top quintiles' percent shares of spending are slightly smaller (one or two percentage points), and bottom quintiles' slightly larger (See Figure 14 in Technical Appendix B). The DCHIAs allocate household PCE to income quintiles based on those adjusted CEX expenditure shares. (This is separate from the construction of the CEX income-quintile "buckets" themselves, also discussed in Technical Appendix B.)

²⁶ CEX undercounts PCE spending by roughly 40% (so only its quintile percent-shares are used here, to allocate total PCE to quintiles), and arguably undercounts top-percentile spending by even more. But it's "the only dataset with comprehensive and detailed information on household expenditure and its components." (<u>Attanasio 2016</u>). See BEA, 2019. "Comparing expenditures from the Consumer Expenditure Survey with the Personal Consumer Expenditures: Results of the CE/PCE Concordance." <u>bls.gov/cex/cepceconcordance.htm</u> Spreadsheet: "Summary comparison of aggregate Consumer Expenditures (CE) and Personal Consumption Expenditures (PCE)"

<u>bls.gov/cex/pce-compare-200916.xlsx</u>. Sabelhaus, John et al., 2013. "Is the Consumer Expenditure Survey Representative by Income?" <u>nber.org/papers/w19589</u> Bee, Adam, Bruce D. Meyer, and James X. Sullivan. "Micro and Macro Validation of the Consumer Expenditure Survey." 2012 <u>conference.nber.org/confer/2011/CRIWf11/Bee_Meyer_Sullivan_March2012.pdf</u>

²⁷ CEX results are only available in separate year-by-year spreadsheets (which are a mish-mash of shifting layouts, calculations, and presentations, available from various different URLs). All back to 1984 are assembled in the accompanying workbook, along with single-sheet compilations of CEX quintiles' spending and income shares for the years examined here.

²⁸ In the NIPAs and DCHIAs, these contributions are treated on the income side: they're subtracted from gross transfers received to yield net transfers received.

Net Accumulation of Consumer Durables. This measure, totalling \$3.6T over 21 years, must be added to balance sheets because durables are an asset category thereon, so the period-to-period holdings changes must be accounted for. PCE includes (gross) spending on durables, but the necessary add-back of the accumulated durables/nonfinancial assets to the balance sheet is handled variously on different tables. The measure used here is households-only, from <u>F.6</u> (line 31 or 42, or 21 minus 27): net investment in durable goods.²⁹ That volume accumulation is allocated to quintiles based on each quintile's holding share of durable goods, from the DFAs.

Misc: Disaster losses, pension & insurance adjustments. These very small measures are combined here; they total \$288B over twenty years. Their estimation and allocation is detailed in the workbook.

Other (other) changes in volume. This measure, totaling \$4.8T over 21 years, includes "bad debts, accounting changes, data discontinuities," etc. (<u>Teplin et. al.</u> p. 6). A households-only measure is not available, so the measure here is from the IMAs' combined-sector measure, adjusted down based on the household sector's share of combined-sector total assets (~94%). It's allocated to quintiles based on each quintile's percent holding shares of total assets, from the DFAs.

Personal (non-mortgage) interest paid. Comprising \$5T over twenty years, this measure still only forms 2% of personal outlays; it's overwhelmed by PCE. It's allocated to quintiles based on their shares of non-mortgage debt outstanding, from the DFAs.

It's worth noting that in the NIPAs and DPIAs (and hence the DCHIAs), mortgage interest payments by both absentee landlords and owner-occupiers are treated as negative income, silently "pre-deducted" within the derivation of [net] rental income [a.k.a. profits]. If they were instead accounted in personal outlays in the Uses section (as non-mortgage "personal interest" payments are), the personal and comprehensive income measures would be 1–2% higher.³⁰

²⁹ Gross durables investment minus CFC (consumption of fixed capital:durables) = net durables investment. This is a pure volume measure; a very small measure of durables valuation changes is revealed in the IMAs' revaluation account. Ideally, durable-goods volume accumulation would be an additional income category in NIPA personal income, increasing both income and saving. (FA Table <u>F.6</u> provides a reconciliation between the FA and NIPA personal saving measures; the NIPA saving measure does not include durables accumulation and etc.) A similar approach in the IMAs would include durables accumulation in the "capital formation" (a.k.a. investment) measure in the capital account. Instead they add durables net investment/accumulation to the balance sheet via the other changes in volume account, external to the current and capital accounts. F.101 (HHs + NPISHes) provides a measure of durables gross investment, but doesn't include a durables-only measure of consumption of fixed capital (CFC) or, hence, net investment. Table F.6 provides all three: gross investment - CFC = net. That net measure, used here, comports with DFAs' balance-sheet level changes in durables assets.

³⁰ Treatments of mortgage vs personal interest paid vary in different national accounts tables. Mortgage interest is treated as negative income in the NIPAs table 2.9 and DPIAs, deducted within the [net] rental income [profits] derivation. (Owner-occupiers and sole-proprietor absentee landlords are effectively treated as a mini "firms" sector inside the personal/household sector.) The FAs' F.101 starts with NIPA Personal Income, so it does likewise. Personal, non-mortgage interest, by contrast, is not pre-deducted in NIPA 2.9 and F.101; it's part of personal outlays, treated as a "use" of personal income. In

Personal taxes. These measures come into the DCHIAs directly from the DPIAs. They mostly consist of income taxes, and comprise ~90% of household taxes (but a much smaller percent of lower-quintile taxes).³¹

Net new borrowing. Borrowing adds assets and liabilities to the household-sector balance sheet in equal measure (for net-zero effect on net worth); loan payoffs, the reverse. National-accounts measures of household borrowing derive from changes in financial-account liabilities, not from transaction flows. There are no available measures of household gross borrowing or loan payoffs. (Which would in any case face the difficulty of loan rollovers; how much of the gross borrowing is actually "new" borrowing?) So the DCHIAs use the available balance-sheet changes in outstanding liabilities as the measure of net new borrowing. The measures and quintile allocation come directly from the DFA measures of (changes in) liabilities by quintile.

Technical Appendix B: Aligning Income Quintiles

Note: This appendix refers to a separate special-purpose <u>workbook</u>³² that employs the same data as the DCHIAs (plus other data), but is arranged differently, for clarity and transparency in examining income quintiles, and to avoid confusing the DCHIA workbook. See workbook tabs: Graphs, Complncome, and CEX PCE.

There are two big measures in the DCHIAs that are not allocated to income quintiles by the DPIAs: holding gains and PCE. PCE is allocated based on CEX income quintiles (which are constructed based on the CEX before-tax income measure), using the CEX quintiles' percent shares of expenditures (after first removing Social Security and pension contributions from "expenditures.") Holding gains (from the IMAs) are allocated by quintiles' percent holding shares of (financial and nonfinancial) assets from the DFAs (whose quintiles are based on the SCF income measure, adjusted to better comport with NIPA personal income).

This raises an important question: are the DFA and CEX income quintiles equivalent to the DPIAs' income quintiles? Do they include roughly the same households? Certainly, the DFA/SCF and CEX income measures themselves — which are used to rank households and

the IMAs, mortgage interest is not deducted in its "operating surplus" derivation, but both mortgage and personal interest are pre-deducted as negative income via its "Uses of property income (interest paid)" measure. The measures here are drawn directly from the DPIAs: mortgage interest is (silently) pre-deducted as negative income within the rental income derivation, and personal interest is part of personal outlays. It's worth noting that households' mortgage principal payments are just asset swaps from the household balance-sheet perspective, cash for equity (or liability reduction), with no effect on total assets/net worth.

³¹ Other taxes are allocated to quintiles silently in the NIPAs/DPIAs, within their detailed NIPA derivations. Sales taxes are tallied as personal outlays, included in NIPA PCE. Property taxes are included (deducted from personal income) within the NIPA derivation of (net) rental income (profits), for both owner-occupiers and absentee landlords.

³² wealth-economics.com/IncQuintilesCompares.xlsx

assign them to quintile "buckets" — are different from DPIA income. Different sources also use different "household" definitions: family, primary economic unit, tax unit, etc.

But the DCHIAs don't use those DFA and CEX measures directly (except for DFA liability measures, for net new borrowing). Only the DFA and CEX quintile percentage *shares* are used, to *allocate* aggregate IMA holding gains and NIPA PCE. Still, if there's a mismatch between DPIA and DFA/CEX quintiles, it could result in incorrect share allocations for holding gains and PCE, which could explain some of the quintile discrepancies in the DCHIAs.

A few cross-checks are possible to get a sense of those possible quintile mismatches, and the potential magnitude of resulting discrepancies. These comparisons are only indicative; if two quite different quintile methodologies/measures yield quite similar quintile percent-share allocations, the discrepancies from quintile mismatches may not be very significant in the treatment here. (This especially in the context of inevitable estimation difficulties that pervade national-accounting measures.)

Comparing income shares. Figure 13 compares quintiles' shares of income in the DPIAs, CEX, and SCF. The SCF series is shown only for comparison. While it's the basis of the DFA income quintiles, the DFAs use an unpublished adjusted SCF income series that seeks to reconcile SCF income with NIPA personal income.³³ (The dots in the plot would be significantly lower using this measure.) The DCHIAs thus, likewise, allocate the IMAs' revaluation/holding-gain measures using the DFAs' distribution by NIPA-reconciled income quintiles.

Figure 13. Comparing quintile income-share estimates

³³ <u>Batty et. al. 2019</u>: "we apply the distribution observed in the reconciled SCF to the Financial Accounts' aggregates." See <u>Dettling et. al.</u> Appendix A for details of that reconciliation.



Top-Quintile Income Shares: CEX, DPIA, and SCF

2019 quintile income shares: CEX, DPIA, and SCF

CEX-quintile income as % of CEX total income
DPIA-quintile income as % of DPIA total income



The CEX and DPIA treatments use different economic units, different measures for income-quintile ranking, and different measures for share calculations. But the resulting income-quintile shares of income are very similar, within one or two percentage points and often identical. This gives some confidence for the DCHIAs' PCE allocations by CEX income quintiles.

But comparative expenditure shares, discussed below, are more directly pertinent to those estimates.

Comparing expenditure shares. The preferred comparison here, CEX-quintile expenditure shares versus DPIA-quintile expenditure shares, is of course not possible because the DPIAs don't address expenditures. That's the allocation effort that's at issue here. But Figure 14 compares CEX quintiles' expenditure shares based on three different methodologies/measures. Again the differences are within one or two percentage points.

Figure 14. Comparing quintile expenditure shares based on different methodologies



Top-quintile shares of CEX expenditures: three methods



Quintile shares of 2019 CEX expenditures: three methods

CEX income-quintile total expenditure shares

- CEX income-quintile expenditure ex-Social Security and pension contributions shares
- Garner 2022 adjusted-expenditure (consumption) quintiles, adjusted and equivalised CEX expenditure shares



The first measure just divides each CEX income-quintile's expenditures by total CEX expenditures. The second does the same, but Social Security and pension contributions are subtracted from expenditures before calculating percent shares. (These are the percentage share measures used to allocate PCE in the DCHIAs.) The final one is a valuable comparison: <u>Garner et. al. 2022</u> provides data series for 2017–2020, ranking and allocating households into

consumption deciles/quintiles. The ranking is based on household-size equivalised CEX expenditures, using an adjusted CEX expenditure measure that adds expenditures made by government etc. on households' behalf (mainly medical expenditures).³⁴

Even with quite differently defined quintiles and expenditure measures, the Garner expenditure-quintile shares are very close to the basic CEX quintile shares. They're even closer to the DCHIAs' shares after deducting Social Security and pension contributions from CEX expenditures.

The comparisons in this appendix suggest that income-quintile mismatches (and different definitions of economic units) are probably not a significant contributor to the quintile discrepancies remaining in the DCHIAs. The large additional measures suggested in Section Five seem to hold more promise in efforts to track down those discrepancies.

Works Cited

Alvaredo, Facundo, Bertrand Garbinti, and Thomas Piketty. 2017. "On the Share of Inheritance in Aggregate Wealth: Europe and the USA, 1900–2010." *Economica* 84, 239–260. <u>piketty.pse.ens.fr/files/AlvaredoGarbintiPiketty2017.pdf</u>

Atkinson, Anthony B., Thomas Piketty, and Emmanuel Saez. 2011. "Top Incomes in the Long Run of History." *Journal of Economic Literature*, 49:1, 3–71. <u>eml.berkeley.edu/~saez/atkinson-piketty-saezJEL10.pdf</u>

Attanasio, Orazio P. and Luigi Pistaferri. 2016. "Consumption Inequality." *Journal of Economic Perspectives,* Volume 30 Number 2, Spring 2016, pp 3–28. pubs.aeaweb.org/doi/pdfplus/10.1257/jep.30.2.3

Auten, Gerald. 2022. "Distributing National Income in the US: Alternative Income Definitions and Data Issues." Paper prepared for the 37th IARIW General Conference, Friday, August 26. With permission from the author. <u>iariw.org/wp-content/uploads/2022/08/Auten-IARIW-2022.pdf</u>

Balloch, Cynthia Mei and Julian Richers. 2021. "Asset Allocation and Returns in the Portfolios of the Wealthy." <u>conference.nber.org/conf_papers/f155141.pdf</u>

Batty et. al. 2019. "Introducing the Distributional Financial Accounts of the United States." <u>https://www.federalreserve.gov/econres/feds/files/2019017pap.pdf</u>

Bezemer, Dirk J.. 2021. "Minsky's legacy: two strands." Cambridge Journal of Economics, 45,

³⁴ This treatment examining households' total "consumption" is a useful measure of inequality, for instance in assembling the U.S. supplemental poverty measure, or for international comparisons of well-being. But it can't be used in the DCHIAs' effort to explain changes in quintiles' assets and net worth, which is based on household (consumption) expenditures, not consumption.

391-409. academic.oup.com/cje/article-abstract/45/2/391/6146829

Bureau of Economic Analysis. Undated. "Why do the NIPAs exclude capital gains from income and saving?" <u>bea.gov/help/faq/67</u>

Dettling et. al. 2015. "Comparing Micro and Macro Sources for Household Accounts in the United States: Evidence from the Survey of Consumer Finances" Federal Reserve Finance and Economics Discussion Series 2015-086.

federalreserve.gov/econresdata/feds/2015/files/2015086pap.pdf

Fisher, Jonathan D., David S.Johnson, Timothy M. Smeeding, and Jeffrey P. Thompson. 2020. "Estimating the marginal propensity to consume using the distributions of income, consumption, and wealth." *Journal of Macroeconomics*, Vol. 65. Working paper: <u>bostonfed.org/-/media/Documents/Workingpapers/PDF/2019/wp1904.pdf</u>

– 2021. "Inequality in 3D." Review of Income and Wealth, Volume 68 Issue 1. onlinelibrary.wiley.com/doi/10.1111/roiw.12509

Fixler, Dennis, Marina Gindelsky, and Robert Kornfeld. 2021. "The Feasibility of a Quarterly Distribution of Personal Income." BEA Working Paper Series, WP2021-8. bea.gov/system/files/papers/BEA-WP2021-8_1.pdf

Garner, Thesia et. al. 2022. "Distribution of U.S. Personal Consumption Expenditures for 2019: A Prototype Based on Consumer Expenditure Survey Data." BLS working paper 557. <u>bls.gov/osmr/research-papers/2022/pdf/ec220120.pdf</u> Spreadsheet (12/27/2002): <u>bls.gov/cex/distributional-pce-2017-2020.xlsx</u>

Gindelsky, Marina. "Do transfers lower inequality between households? Demographic evidence from Distributional National Accounts." *Economic Inquiry* Jan. 2022. <u>onlinelibrary.wiley.com/doi/full/10.1111/ecin.13061</u>

Hicks, John. 1946. *Value and Capital,* 2nd ed. Oxford: Clarendon Press. wealth-economics.com/Hicks1946ValueAndCapital.pdf (12 MB PDF)

Kartashova , Katya and Xiaoqing Zhou. 2021. "Wealth Inequality and Return Heterogeneity During the COVID-19 Pandemic." Federal Reserve Bank of Dallas. papers.ssrn.com/sol3/papers.cfm?abstract_id=3967802

Larrimore, Jeff, Richard V. Burkhauser, Gerald Auten and Philip Armour. 2021. "Recent Trends in US Income Distributions in Tax Record Data Using More Comprehensive Measures of Income Including Real Accrued Capital Gains." *Journal of Political Economy* Volume 129, Issue 5. journals.uchicago.edu/doi/full/10.1086/713098

Mehrling, Perry. 1999. "The vision of Hyman P. Minsky." Journal of Economic Behavior &

Organization 39. Ungated scanned version: <u>sites.bu.edu/perry/files/2019/04/The-Vision-of-Hyman-P.-Minsky.pdf</u>

Mian, Atif, Ludwig Straub, and Amir Sufi. 2021. "The Saving Glut of the Rich." Chicago Booth and NBER: <u>scholar.harvard.edu/files/straub/files/mss_richsavingglut.pdf</u>

Morelli, Salvatore, Brian Nolan, Juan C Palomino, and Philippe Van Kerm. 2021. "Inheritance, gifts and the accumulation of wealth for low-income households." *Journal of European Social Policy*, Volume: 31 issue: 5, pp. 533-548. journals.sagepub.com/doi/full/10.1177/09589287211040419

Neilson, Daniel. 2009. Minsky. Polity Books.

Nolan, Brian, Juan C. Palomino, Philippe Van Kerm, and Salvatore Morelli. 2021. "Intergenerational wealth transfers and wealth inequality in rich countries: What do we learn from Gini decomposition?" *Economics Letters* 199. <u>sciencedirect.com/science/article/abs/pii/S0165176520304614?via%3Dihub</u>

Roth, Steve. 2021a. "Why the Flow of Funds Don't Explain the Flow of Funds: Sectoral Balances, Balance Sheets, and the Accumulation Fallacy." Working paper: <u>mpra.ub.uni-muenchen.de/109976/8/MPRA_paper_109976.pdf</u>

– 2021b. "How downward redistribution makes America richer." *Real World Economics Review* 95. <u>paecon.net/PAEReview/issue95/Roth95.pdf</u>

Sabelhaus, John Edward, and Jeffrey P. Thompson. 2022. "Racial Wealth Disparities: Reconsidering the Roles of Human Capital and Inheritance." FRB of Boston Working Paper No. 22-3. <u>papers.ssrn.com/sol3/papers.cfm?abstract_id=4036098#</u>

Saez, Emmanuel and Gabriel Zucman. 2019. "Progressive Wealth Taxation." Brookings Papers on Economic Activity.

https://brookings.edu/wp-content/uploads/2019/09/Saez-Zucman_conference-draft.pdf

Saez, Emmanual and Gabriel Zucman. 2020. "Trends in US Income and Wealth Inequality: Revising After the Revisionists." NBER working Paper 27921. <u>nber.org/papers/w27921</u>

Salas-Rojo, Pedro and Juan Gabriel Rodríguez. 2022. "Inheritances and wealth inequality: a machine learning approach." *The Journal of Economic Inequality*. <u>link.springer.com/article/10.1007/s10888-022-09528-8</u>

SNA. "System of National Accounts 2008." unstats.un.org/unsd/nationalaccount/docs/sna2008.pdf

Teplin, et. al. 2006. "Integrated Macroeconomic Accounts for the United States, Draft

SNA-USA." In Jorgenson et. al., *A New Architecture for the U.S. National Accounts.* University of Chicago Press. <u>nber.org/system/files/chapters/c0145/c0145.pdf</u>

Xavier, Inês. 2020. "Wealth Inequality in the US: The Role of Heterogeneous Returns." papers.ssrn.com/sol3/papers.cfm?abstract_id=3915439