Why the Flow of Funds Don't Explain the Flow of Funds: Sectoral Balances, Balance Sheets, and the Accumulation Fallacy

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Why the Flow of Funds Don't Explain the Flow of Funds: Sectoral Balances, Balance Sheets, and the Accumulation Fallacy

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Abstract: This paper highlights and unpacks a little-known reality about the *Financial Accounts of the United States*: the Flows matrix on page 1 of the Federal Reserve's quarterly Z.1 report does not explain period-to-period changes in the Levels matrix on page 3. The same is true of the sectoral Flow and Levels tables underlying those matrixes. Nor do those tables provide balance-sheet-complete accounting of household or national wealth accumulation. Measures of net saving/investment/capital formation and accumulation, and national wealth accumulation, diverge by tens of trillions of dollars. The discrepancy is explained and resolved by assembling a balance-sheet-complete empirical derivation of comprehensive U.S. "Haig-Simons" income, based on the Integrated Macroeconomic Accounts. The comprehensive measure is 23% higher than national accounts' "primary" income. Relationships to the Piketty/Saez/Zucman Distributional National Accounts (DINAs) are discussed, along with implications for economic theory and empirical modeling, both mainstream and heterodox/Post-Keynesian.
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In the June, 2018 release of its quarterly Z.1 report ("Financial Accounts of the United States"), the Federal Reserve includes a "Highlight" note that will appear to many as just a trivial change in terminology (emphasis added).[1]

> 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 **<u>transactions</u>, <u>revaluations</u>, and <u>other changes in volume</u>**. 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).[2]

This is more than just a label change. The note acknowledges a reality that has always existed in the Fed's Flow of Funds (FOF) accounting, but that many may find deeply surprising: the sectoral Flows (now Transactions) matrix on page 1 of the Z.1 *doesn't explain period-to-period changes in the Levels matrix on page 3*. Not even close. The same is true of the sectoral (F)low and (L)evels tables that lie behind those matrixes. The flows don't equal changes in stocks.

This discrepancy exists mostly because the Levels tables tally sectoral asset holdings at end-of-period market prices; they mark assets to market. A market price runup during a period increases

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[1] federalreserve.gov/releases/z1/20180607/html/introductory_text.htm
[2] The Transactions tables still retain the F prefix in their titles: F.101, for instance, for the household-sector Transactions table.

sectors' asset holdings, and the total stock of assets. But that price-driven increase — "revaluation" in modern national-accounting-speak, as distinguished from "volume" changes — is absent from the Transactions/Flows matrix, and tables. Holding gains/losses are ignored and invisible therein. Tens of trillions of dollars in wealth accumulation over past years and decades remains unexplained by the accounted transactions.[3]

Additionally, the Levels tables aren't complete balance sheets; they only tally financial assets. In particular, ownership holdings of real-estate titles (currently 23% of household assets) are absent. This makes the F tables even more "balance-sheet incomplete," because they (necessarily) can't and don't tally revaluation of nonfinancial assets.

If total financial assets (on the Levels tables) or total assets (on balance sheets) are the bottom-line "stock" measures, the Flow of Funds matrix and tables aren't "stock-flow consistent" (SFC). And "sectoral balances" — which are compiled from the flow of funds matrix and tables — are likewise balance-sheet incomplete.

The Transactions-matrix accounting is of course necessary for complete SFC accounting, but isn't itself fully SFC. It balances to zero (with statistical discrepancies), in a closed-loop or "circuitist" construct. It doesn't balance to total (financial) assets, or net worth.

Enter the IMAs

The Fed note's reference to the System of National Accounts (SNAs) is significant. It silently gestures toward a separate set of national-accounting statements that are also included in the Z.1, as the S tables: the Integrated Macroeconomic Accounts.[4] These accounts conform except in some details to the international SNA methodologies, concepts, and accounting structures, developed under the aegis of the United Nations. (Think "generally accepted accounting principles," or GAAP, but for countries.) Equivalent standards and practices also necessarily apply to international Balance of Payments accounting. The IMA accounts are built upon the NIPA and Flow of Funds' measures and underlying data sources, but expand on them to provide balance-sheet-complete accounting of "economic flows," and complete balance sheets for all sectors.[5] Economist have remained largely unaware of the IMAs, and their import. A

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[3] The Levels tables' mark-to-market methodology adds sectors' *accrued* gains to their holdings, whether or not individual asset holders might have "realized" some of those gains (so must report them for tax purposes) — swapped their variable-priced assets with other asset holders for fixed-price "M" assets. Those exchanges/"realizations" are dollar-for-dollar swaps; they add no assets to any balance sheet, individual or sectoral. The markup-to-market accounting events are what add assets to wealthholders' brokerage account statements, and to individual and sectoral balance sheets.

[4] The IMAs' annual tables were released in 2006, with coverage back to 1960; quarterly tables were released in 2012.

[5] The Flow of Funds have developed (B)alance sheet tables for three "real" sectors — notably households — over past decades, along with necessary (R)econciliation tables that include both revaluation and volume measures. But tracking derivations for these sectors across four tables (F, L, R, and B) — much less across sectors — is challenging even for accounting adepts. This especially as Balance Sheet and Reconciliation tables are not provided for financial, government, or rest of world sectors.

RePEc/Ideas literature search for "integrated macroeconomic accounts" yields only eight hits over the fifteen years since the accounts were released.

The IMAs achieve complete SFC accounting by adding two necessary accounts explicitly mentioned in the Fed note, that are absent from the FOFs and NIPAs: Revaluation, and Other Changes in Volume. The representation of the IMAs' account structure, plus a simplified diagram depicting the IMAs' derivation of change in net worth from period start to period end, helps clarify the differences between the IMAs, the Flow of Funds, and the NIPAs.
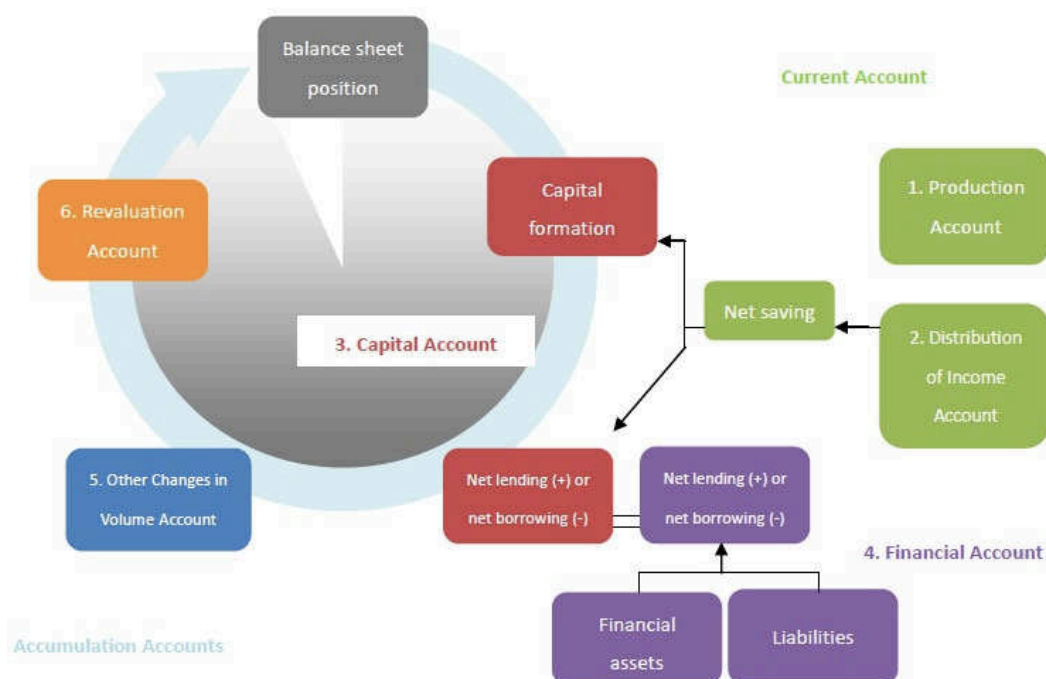

Figure zz. The IMA's sequence of accounts.[6]

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[6] Cagetti, Marco and Holmquist, Elizabeth and Lynn, Lisa and Hume McIntosh, Susan and Wasshausen, David, "The Integrated Macroeconomic Accounts of the United States" (January 7, 2013). Available at SSRN: ssrn.com/abstract=2197527 or dx.doi.org/10.2139/ssrn.2197527. p. 3.
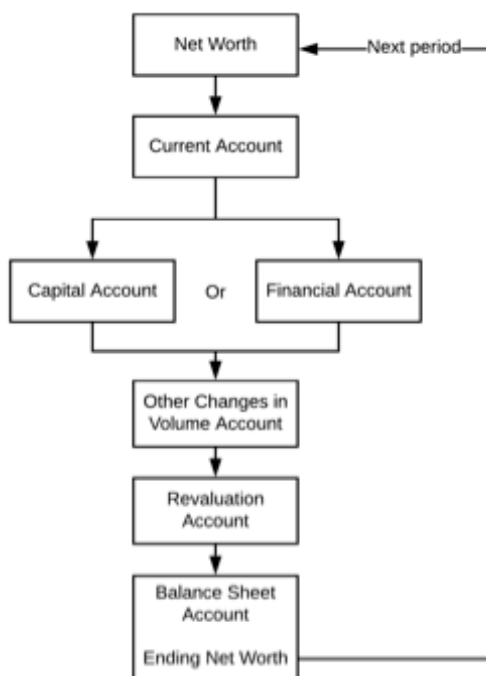
Figure zz. The accounting pathway for the IMAs' derivation of change in sectoral net worth.

Somewhat simplified: The NIPAs encompass the Current and Capital accounts. The FOFs add the Financial account (and a whole pyramid of underlying financial details tables — the "Financial Accounts"). The IMAs complete the accounting of "economic flows" (hence wealth accumulation) by 1. adding the Revaluation and Other Changes in Volume accounts, 2. including nonfinancial assets in its tallies, and 3. tallying complete balance sheets for all sectors.

The IMAs' precise derivation of "Change in net worth" (line 96 in the annual household table S.3.a, e.g.) helps further clarify the construction.

Starting Net Worth
+Capital formation, net, Capital account
+ Net lending (+) or Net borrowing (-), Capital account[7]
  (*N.B.*: Capital formation - Net borrowing = Net Saving, Current account)
+ Total other volume changes, Other Changes in Volume account
+ Changes in net worth due to nominal holding gains/losses, Revaluation account
= Ending Net Worth

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[7] Theoretically, this capital-account measure should be identical to net lending/borrowing for the financial account. They vary only by the statistical discrepancy; the two accounts measure different things using different sources and methodologies. In the IMAs that discrepancy is included in, and added to balance sheet assets via, the Other changes account. With that somewhat hidden addition, the IMAs' actual operative "volume" change in net worth from Net Lending/Borrowing is for the Financial (vs the Capital) account. This is necessary to achieve accounting coherence with the balance-sheet bottom line: change in monetary net worth — total assets minus total liabilities.

A plot of those four measures using the household sector as an example imparts a sense of their relative magnitudes. (The household sector is effectively the top of the accounting-ownership pyramid; excluding foreign holdings of U.S. equities, all U.S. firms' market-cap value is included as assets on the household balance sheet.)
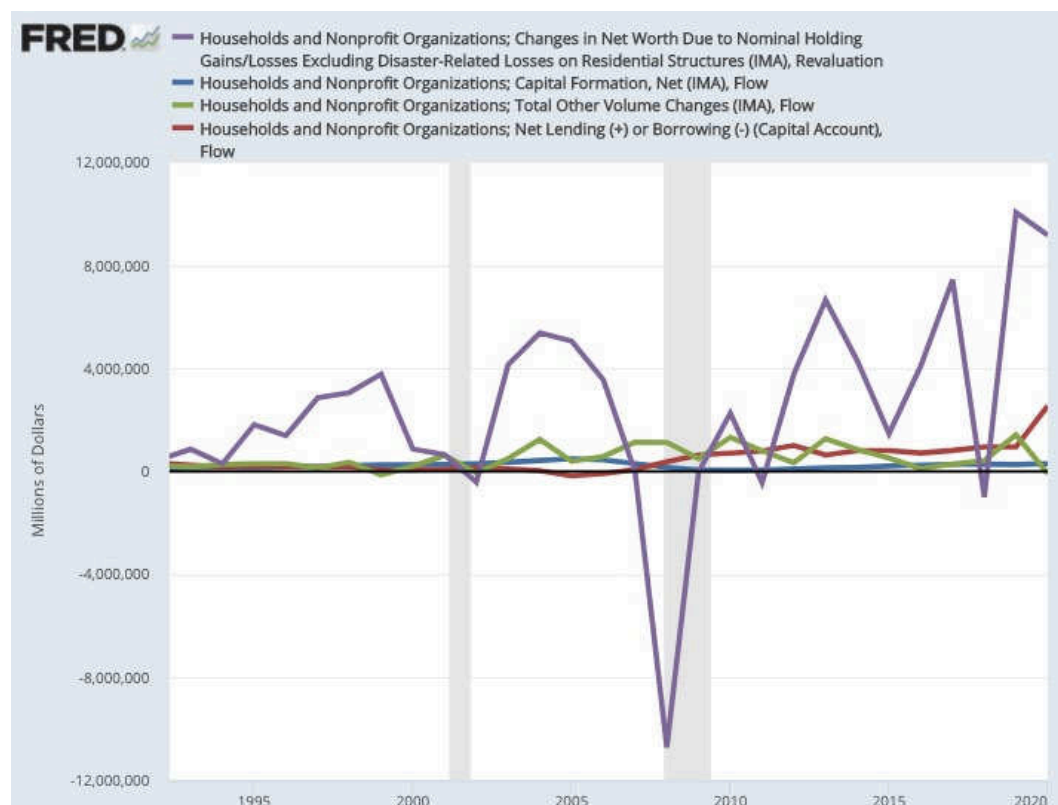

Figure zz. Derivation measures for changes in household net worth. IMAs Household Table S.3. (N.B.: in the IMAs, the small measure of disaster losses is tallied via the Other Changes in Volume account.) fred.stlouisfed.org/graph/?g=C6by

Sectoral-balances graphs represent only one of these measures: sectors' net lending/borrowing. While this measure can be revealing and meaningful, the magnitude is fairly small in the context of total economic flows, especially complete "economic flows" that comprise wealth accumulation.

One significant terminology difference is worth noting. Where the NIPAs' and the FOFs' labels refer to "investment" (spending), the IMAs opt for "capital formation." The measures are empirically equivalent, but the concepts are different. Investment spending — paying people and firms to produce goods that are not consumed within the accounting period — is what causes "real" capital formation.[8] (Alternately: capital formation *as observed* on units' capital accounts,

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[8] One important detail difference is also worth noting. The NIPAs treat household purchases of consumer durables (vehicles are the largest component) as consumption spending, not investment. The FOFs treat them as investment. The IMAs do neither; consumer-durables purchases are squirreled away in the catch-all Other Changes in Volume account. For the purposes of tallying stock measures, however — balance-sheet assets — all

especially firms', can be subtracted from total spending on final goods, also observed, to derive consumption spending for purchases of goods that are consumed within the period.)

To be clear: most national capital formation, which is primarily done by firms, is invisible in this household-sector view. (See ensuing graphs for national and all-sector measures.) But firms' capital formation does ultimately redound to household balance-sheet assets. Increases in firms' book value from capital formation affect the firms' share prices hence market-cap value on household balance sheets.[9] (Though that causal relationship, embodied in changing book-to-market ratios, is perhaps irreducibly indeterminate.)

While capital formation by firms (owned by households) is the ultimate "source" of much new household wealth, most of the new capital-asset value actually arrives on household balance sheets through holding gains — new assets created out of mark-to-market thin air. Markets observe the firms' new/increased capital/book value, and bid up share prices, increasing households' asset holdings. In accounting terms, those household gains don't "flow from" anywhere; no sector posts new offsetting liabilities when asset prices rise.[10] This explains why the "economic flow" of capital gains is absent from the "flow of funds."

If firms' capital formation is "backed-out" of households' holding gains, attributed instead to capital formation, the household holding gains measure is reduced, and the capital formation measure is increased. In particular since the 1990s, however, household asset accumulation from equity holding gains has greatly outpaced increases in firms' book value — even if annual changes are tallied in inflation-adjusted dollars to estimate their ending, cumulatively-summed "real" or "current-cost" value.[11]

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accounts (necessarily) treat durables purchases *as if* they were investment, adding to sectoral stocks of nonfinancial assets. (They are likewise depreciated as part of Consumption of Fixed Capital, CFC.) They're included as an asset category on household hence national balance sheets (B.1, B.101, and S.3). The dollar magnitude of durables purchases is not insignificant. If they're added to and included as part of Gross Private Domestic Investment, for instance, they comprise 25–30% of that total private investment measure. Because durables depreciate rapidly, however, the durables stock is only about 15% of household nonfinancial assets.

[9] Firms' book value is also reduced by dividend distributions; the remainder is retained earnings, which equals firm-sector Saving. Since firms by construction do no consumption spending in any national accounts, their retained earnings/saving, minus taxes, equals their "disposable income." In Piketty's words, "it is better to treat retained earnings as savings realized on behalf of the firm's owners and therefore as a component of private saving." *Capital*, p. 177.

[10] As a result, the oustanding stock of financial assets does not equal the outsanding stock of liabilities — a widespread truism — though issuers' liabilities and holders' assets are generally equal at issuance. This is manifest for equities, but starting with the March 2019 Z.1 report, the Fed even started explicitly reporting market-to-book asset "discrepancies" for treasury, agency, municipal, corporate, and foreign bonds.

[11] Saez and Zucman provide a very coherent discussion of this topic in the 2019 online appendix to *Triumph of Injustice.* eml.berkeley.edu/~saez/SZ2019Appendix.pdf. Based on historical figures, they use a "backout" amount equaling 3% of national income, applied across all years. See, e.g., the footnote to Table TG1 in PSZ2020AppendixTablesII(Distrib).xlsx.
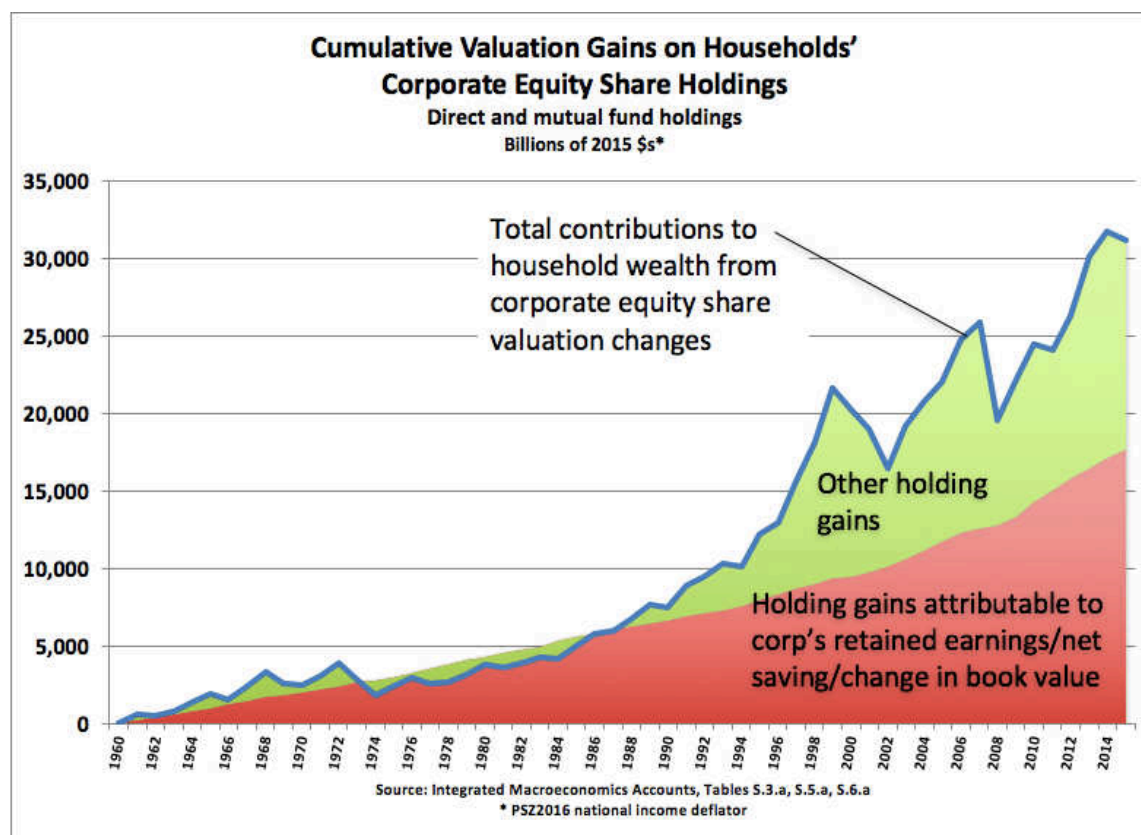
Figure zz. Annual measures for each series are inflation-adjusted prior to summing/addition, to estimate the ending cumulative sums in "real" or "current-cost" terms.[12]

A similar picture pertains to real estate, holdings of land titles as assets. Nominal revaluation gains on those holdings sum to $24T over six decades — in the same ballpark as equity holding gains. A comparable measure of "book value" accumulation for real estate, however, is conceptually and empirically much more difficult to assemble.

Moving from household to total-economy or "national" measures (so obviating the need to break out firms' book-value changes, which are resolved in the netted-out national aggregate measures), the discrepancy between saving/investment/capital formation and changes in wealth is equally apparent.

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[12] Cumulative-sum measures in this paper simply implement accountants' standard "perpetual inventory method": starting stock + inflows - outflows = ending stock, repeated period after period.
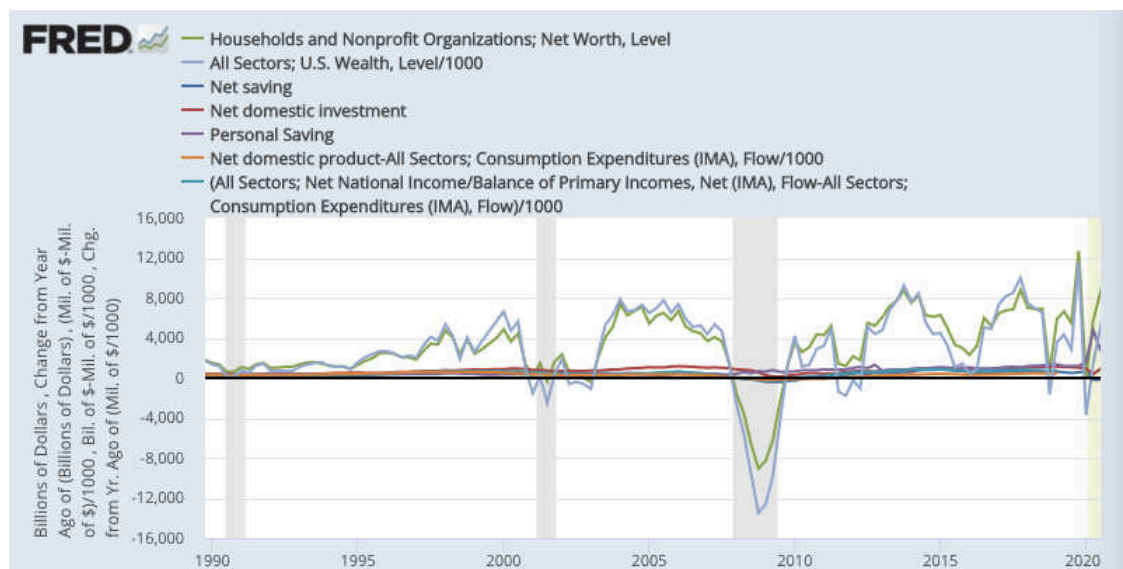
Figure ZZ. The top two lines depict quarterly changes in two alternate Fed measures of national wealth (tables B.101 or S.3 household net worth, vs B.1 U.S. Net Wealth). The remaining measures are quarterly flows. All measures are in nominal dollars. fred.stlouisfed.org/graph/?g=CSDQ.

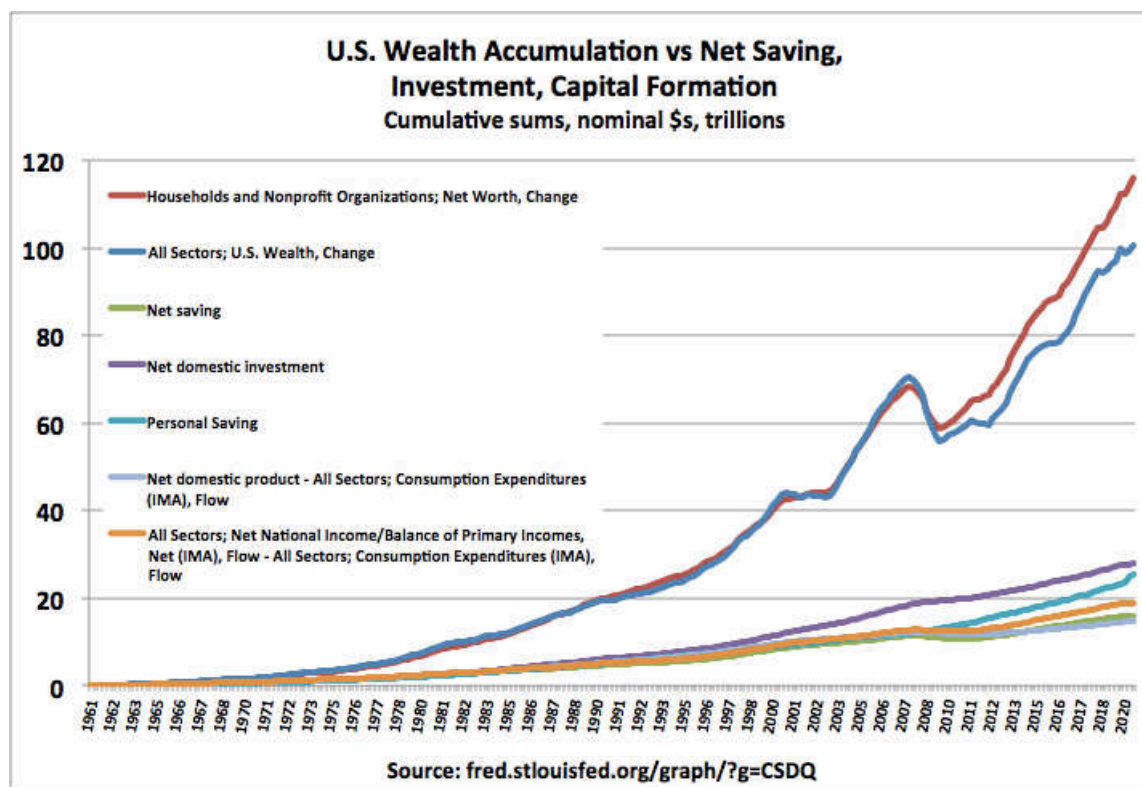The discrepancy is perhaps more clearly depicted as cumulative sums.

Figure zz. Since these measures are all in nominal dollars, the righthand-side sums (e.g. $118T in 2020 end-of-year household net worth) are dominated by accumulation over recent years and decades. fred.stlouisfed.org/graph/?g=CSDQ

Stock measures of wealth and capital, likewise, are very different. Measures of the capital stock are presented at inflation-adjusted "current" or replacement cost. (Employing perpetual-inventory accounting, as in the previous figure.)
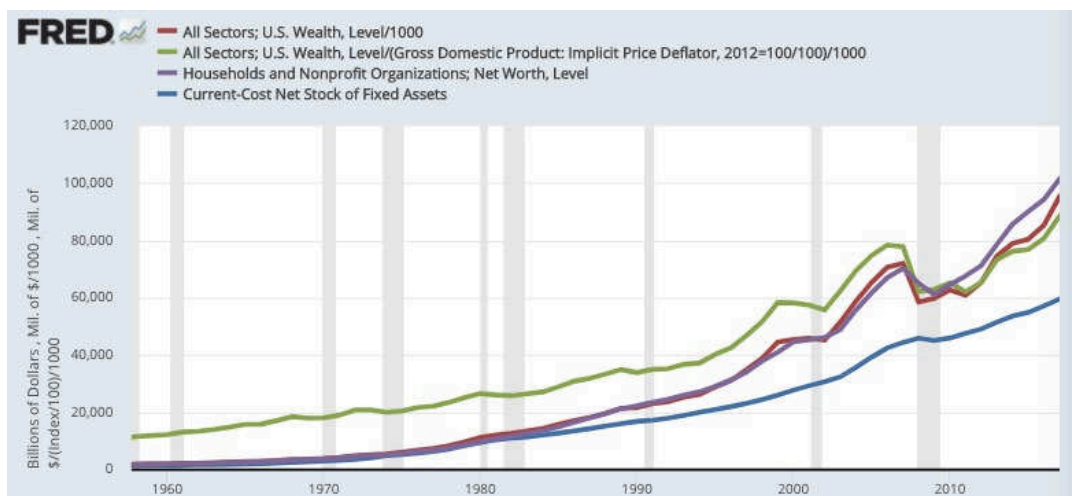

Figure zz. The fixed-assets/capital measure here is in constant 2012 dollars. The other three measures are wealth estimates, with one also deflated for comparison, in 2012 dollars. fred.stlouisfed.org/graph/?g=DF2Q

Another construction assembled from diverse sources paints a similar picture.

Figure zz. Source series: fred.stlouisfed.org/graph/?g=vAIu
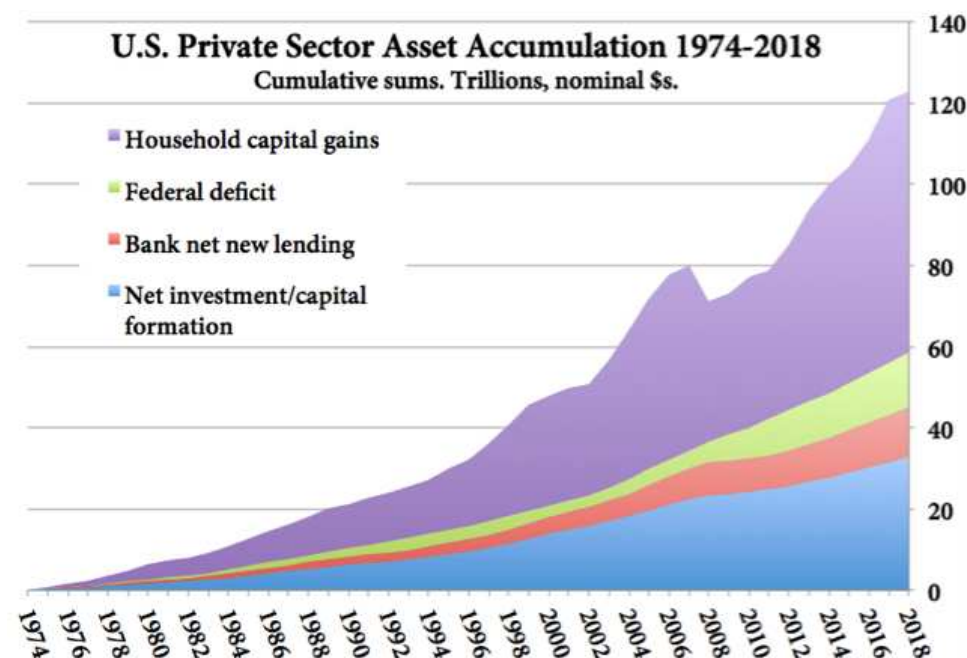
Rather surprisingly given the difficulty of economic measurement, this $123T estimate of cumulative asset creation over forty-five years exactly matches total household asset holdings at the end of 2018.

By any of these national measures of "what we produce minus what we consume," a great deal of national wealth accumulation, and national wealth, remains unexplained. It's a troublesome condition given the focus and title of Adam Smith's most iconic book, so central to so much economic thinking.

Holding gains are the missing 8,000-pound elephant in the room. (Other Changes in Volume is minor by comparison, and is largely a matter of labeling and categorization choices.) That elephant is invisible in the Flow of Funds matrix and tables; they are an incomplete model of wealth accumulation. But that incomplete model silently serves as the basis for almost all theoretical and empirical, accumulation-based macroeconomic growth modeling, both mainstream and heterodox.

Neoclassical and Post-Keynesian Accumulation Modeling

For any economic model or theory in which capital or wealth (accumulation) measures have an operative effect — on production, investment, spending, income, or income's residual, saving, etc. — the large empirical wealth-capital discrepancy seems to require careful consideration. "Capitalists'" return on capital, for instance (capital's "productivity" or "efficiency"), ends up being very different from wealthhholders' total return on balance-sheet assets, wealth. But both mainstream and heterodox theories and models almost universally, and mostly silently, treat the two measures (and ratios/returns) as equivalent.

That conflation is perhaps stated most explicitly by Thomas Piketty in *Capital* (p. 59): "To simplify the text, I use the words 'capital' and 'wealth' interchangeably." In that book's "second fundamental law of capitalism," β [wealth or capital over national income]=saving/national-income growth, wealth can only increase via saving, a.k.a. capital formation. Return on capital and return on wealth are treated as equivalent.

Another clear example arises in a heavily-cited workhorse neoclassical model (Kotlikoff and Summers, 1981) that seeks to explore the effects of intergenerational wealth transfers.[13] A passage discussing wealth accumulation suddenly becomes an explanation, proof, or test of capital formation.

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[13] Kotlikoff , Laurence J. and Summers , Lawrence H. "The Role of Intergenerational Transfers in Aggregate Capital Accumulation." 1981, Journal of Political Economy vol. 89, no. 4. p. 706. Available online: piketty.pse.ens.fr/fichiers/enseig/ecoineg/articl/KotlikofSummers1981.pdf. To complicate this study, the authors' wealth measures are not observed; they are themselves complexly- or even circularly-modeled estimates: "A variety of historical U.S. data detailing population, labor earnings, consumption, and government taxes and transfers are used to directly estimate the shapes of historic age-earnings and age-consumption profiles. These profiles are combined with data on rates of return to calculate a stock of life-cycle wealth."

...These profiles are combined with data on rates of return to <u>calculate a stock of life-cycle wealth</u>. This stock of <u>lifecycle wealth is compared with aggregate wealth holdings</u> in the United States. If there were no intergenerational transfers, <u>the stock of life-cycle wealth would exactly equal total U.S. wealth.</u> When intergenerational transfers occur, these two stocks differ by an amount equal to the stock of net received transfers. Hence, <u>comparing total wealth with life-cycle wealth indicates whether the life-cycle model alone can explain aggregate U.S. **capital formation**</u>.

No explanation is given for the sudden shift in terms; the equivalency is just silently assumed — both in this verbal description, and in the paper's formulaic expressions of the accumulation mechanism.

The same situation exists in almost all post-Keynesian work, both theoretical and empirical. In *The Rise and Fall of Money Manager Capitalism*,[14] for instance, Eric Tymoigne and L. Randall Wray state that "saving represents the change in net worth ($S = \Delta NW$)." (p. 20) As we have seen above, it doesn't. A recent paper using "a calibrated Post-Keynesian model" (Ederer and Rehm, 2020), displays the equivalence clearly in a stocks and flows table for a two-sector economy (three, if you treat the "functional classes" of workers and capitalists as separate sectors).[15]

Table 1. *Flows and stocks in the model with endogenous wealth distribution*

| | Households | | Firms | | |
	Workers	Capitalists	Current	Capital	Total
Consumption	$-C_w$	$-C_r$	$+C$		0
Investment			$+I$	$-I$	0
Wages	$+W$		$-W$		0
Profits	$+R_w$	$+R_r$	$-R$		0
Wealth	$-\Delta V_w$	$-\Delta V_r$		$+\Delta K$	0
Total	0	0	0	0	0

Source: Own elaboration.

Change in households' stock of wealth (ΔV) equals change in firms' stock of capital, which is itself purely a function of firms' investment spending.[16] This exactly embodies the closed-circuit, balance-to-zero accounting of the FOF Transactions matrix. Another recent paper in the same modeling tradition (Palley 2017), which "serves as a valuable starting point for" the previous

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[14] Tymoigne, Eric and Wray, L. Randall, 2014. *The Rise and Fall of Money Manager Capitalism.* Routledge. bit.ly/2PVfGIR

[15] Ederer, Stefan and Rehm, Miriam. "Will wealth become more concentrated in Europe? Evidence from a calibrated Post-Keynesian model." Cambridge Journal of Economics, Volume 44, Issue 1, January 2020, Pages 55–72, doi.org/10.1093/cje/bez014 (The running heads in the working-paper version read "neo-Kaleckian.")

[16] Quite admirably given the general silence on this topic, the authors state the omission explicitly, though not until the paper's final paragraph: "we abstract from asset prices and capital gains, which would likely increase the gap in the differential returns of workers and capitalists."

example, parenthetically acknowledges the same capital-wealth conflation: "workers have a positive propensity to save so that they own part of the capital stock (wealth)." (p. 4)[17]

The situation pertains back into the Kalecki profit equation (and into Keynes, and beyond), which likewise doesn't incorporate complete economic flows including revaluation, so can't explain wealth accumulation. "What remains possible," per two Kalecki commentators (Laski and Herbert, 2013), "are speculative bubbles that may increase as long as the capital gains remain notional, i.e. are not realized on a larger basis."[18] This recourse to "bubbles" implies a widely held but empirically unfounded belief: that accrued capital gains are mere volatility, just oscillation around some "true," imagined value of wealth. As depicted in the decades-long and very large positive accumulation of unexplained capital gains above, that belief does not hold empirically.

This widespread and often-silent conflation yields an inescapable result: when the words wealth or capital are used in economic writings, the reader, at least, has no idea which concept or measure is being discussed. In Paul Romer's words (p. 89), "it leaves ample room for slippage between statements in natural versus formal language."[19]

Enter Comprehensive Income

The discrepancy between measured capital accumulation and wealth accumulation can be quite clearly understood in accounting terms by revisiting the concept and measure of "income," and its residual, "saving." Until the mid-20th century, the "preferred" income measure was "Haig-Simons" income. We'll refer to it here as "comprehensive income," to distinguish it from "primary income." (In the IMAs/SNAs' careful usage, it's called "Net national income/Balance of primary incomes.")

Primary income is what most economists are familiar with. Ignoring transfers for the moment to focus on market income, for households it consists of 1. labor compensation (wages, salaries, and employers' social contributions) and 2. property income (dividends, interest, and pass-through profits from business ownership). In IRS terminology, they're earned and unearned income.

Comprehensive Haig-Simons income adds the measure that's included via the IMAs' Revaluation account, but that is absent from the Flow of Funds:

Comprehensive Haig-Simons income
= Primary income + accrued capital gains
= Consumption spending + change in net worth

[17] Palley, Thomas, 2017. "Inequality and growth in neo-Kaleckian and Cambridge growth theory." Review of Keynesian Economics, vol. 5, no. 2, 146–69. ideas.repec.org/p/imk/wpaper/167-2016.html

[18] Laski, Kazimierz and Walther, Herbert. "Kalecki's Profit Equation after 80 Years." Working paper, Vienna Institute for International Economic Studies, 2013. bit.ly/3sV93EB

[19] Romer, Paul. "Mathiness in the Theory of Economic Growth." *American Economic Review: Papers & Proceedings* 2015, 105(5): 89–93. dx.doi.org/10.1257/aer.p20151066

This definition has the advantage of comporting quite simply with "what we've produced minus what we've consumed" understandings of accumulation. Comprehensive *saving* would simply equal change in net worth. (Alternately, we could abjure the word "saving" entirely, and just say "change in net worth.")[20]

> Comprehensive saving
> = Comprehensive income – consumption expenditures
> = Change in net worth

These definitions may seem radical today because "that's not how income and saving are defined." But from its development in the late 1800s/early 1900s into the 1940s and beyond, comprehensive income was the "preferred" measure.

In *Value and Capital* (1946), for instance, John Hicks discusses income as "consumption *plus* capital accumulation" at chapter length (even going so far as to say that it's "completely objective").

> The capital value of the individual's property at the beginning of the week is an assessable figure; so is the capital value of his property at the end of the week; thus, if we assume that we can measure his consumption, his income *ex post* can be directly calculated. (pp. 178–179.)

In the International Monetary Funds' 1995 *Tax Policy Handbook* (p. 117), John R. King describes Haig-Simons income (even quoting Simons directly) as "probably the most influential definition of the personal income of an individual, in a particular period of time."[21]

In a 2011 paper[22] (pp. 34–35), Anthony Atkinson, Thomas Piketty, and Emmanuel Saez speak of "a 'preferred' definition of income, such as the Haig-Simons comprehensive definition, which includes such items as…accruing capital gains and losses." They explain that less-complete income measures are largely a result of measurement difficulty; available economic income data has traditionally relied heavily on tax returns. (Emphasis added.)

> Perhaps the most important aspect that affects the comparability of [income] series over time within each country has been the erosion of capital income from the progressive income tax base. Early progressive income tax systems included a much larger fraction of capital income than most present progressive income tax systems. Indeed, over time, *many sources of capital income*, such as interest income or returns on pension funds, have been

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[20] A perhaps-troubling implication arises here: if total wealth based on current asset-market prices is the asset markets' best estimate (or at least index) of "what our stuff is worth," that means we've been seriously undercounting GDP at least since the 1990s. It also suggests that productivity (growth) over that period — output per hour worked — has not been nearly as lackluster as it appears in GDP-based measures.

[21] King, John R. "The Concept of Income." In Shome, Parthasarathi, ed. *Tax Policy Handbook.* Washington, International Monetary Fund, 1995. bit.ly/3wrEEQv.

[22] Saez, Emmanuel and Zucman, Gabriel. "Progressive Wealth Taxation." Brookings Papers on Economic Activity, September 2019. brookings.edu/wp-content/uploads/2019/09/Saez-Zucman_conference-draft.pdf

either taxed separately at flat rates or fully exempted and, hence, *have disappeared from the tax base*.

In all cases, *only realized capital gains are included*, if at all, in tax statistics and *no information on accruing capital gains is available*.

These measures' exclusion from tallies of income (hence saving) is to a great extent just an artifact of their exclusion from the tax base. (Both exclusions, it's worth noting, are deeply congenial to wealthholders.)

Despite this understanding, Piketty and company largely abjure comprehensive income as a measure. Their Distributional National Accounts (DINAs), for example, explicitly set out to depict the distribution of "national" (primary) income. Those accounts' additional measures of distributional income that do include capital gains only treat realized gains — leaving those measures still deeply incomplete by comprehensive-income standards based on accrued, mark-to-market gains.[23]
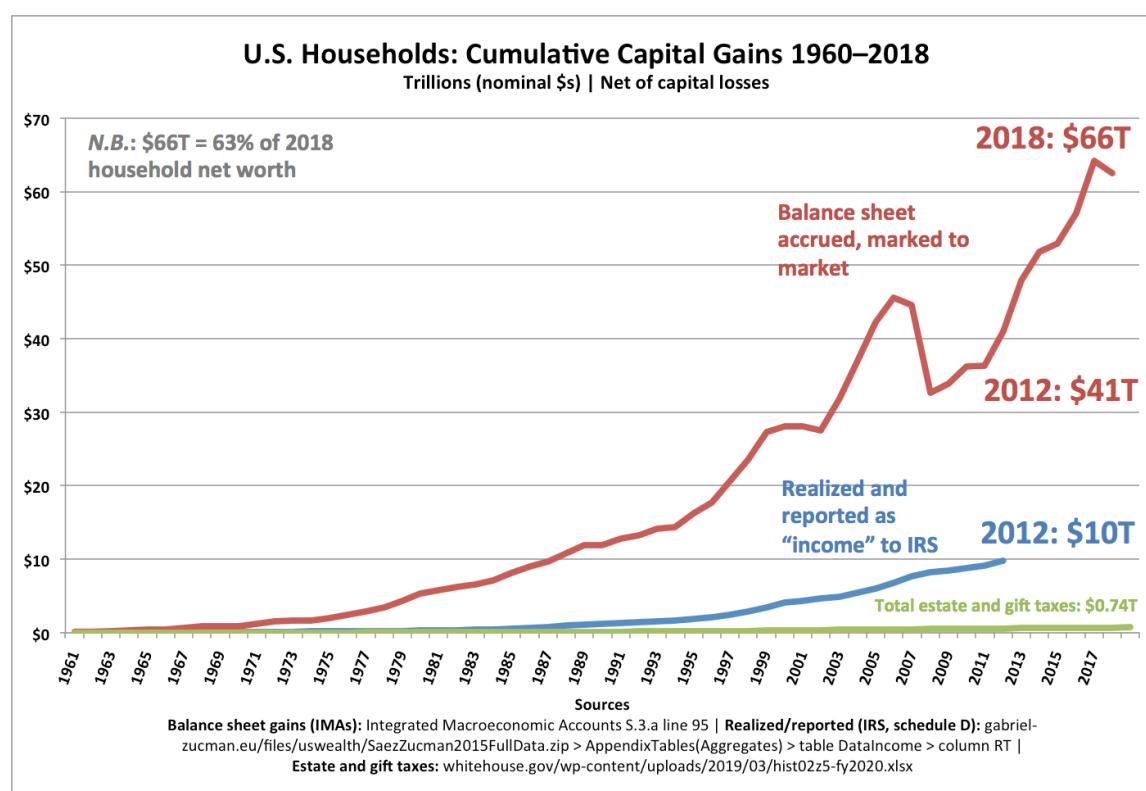

U.S. Households: Cumulative Capital Gains 1960–2018
Trillions (nominal $s) | Net of capital losses

N.B.: $66T = 63% of 2018 household net worth

2018: $66T

Balance sheet accrued, marked to market

2012: $41T

Realized and reported as "income" to IRS

2012: $10T

Total estate and gift taxes: $0.74T

Sources
Balance sheet gains (IMAs): Integrated Macroeconomic Accounts S.3.a line 95 | **Realized/reported (IRS, schedule D):** gabriel-zucman.eu/files/uswealth/SaezZucman2015FullData.zip > AppendixTables(Aggregates) > table DataIncome > column RT | **Estate and gift taxes:** whitehouse.gov/wp-content/uploads/2019/03/hist02z5-fy2020.xlsx

Figure ZZ.

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[23] Note that PSZ's work on wealth levels, changes, and shares does necessarily incorporate unrealized capital gains, because their method is based on the relationship between observed wealth (changes), total rates of return, and capitalizion ratios between those measures. But that balance-sheet-complete methodology is distinct from the (shares of) national income tallied in the DINAs.

Zucman and Saez do repeatedly invoke comprehensive, Haig-Simons income — though not by those names — in a 2009 Brookings paper, "Progressive Wealth Taxation."[24] They call it "true economic income" (nine usages in the paper). That term's unstated derivation clearly embodies the complete "economic flows" mentioned in the Fed's Z.1 note, and the Haig-Simons concept of comprehensive income:

> For 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. (p. 18)

The most complete discussions and employment of comprehensive Haig-Simons income in recent decades appear in Wynne Godley and Marc Lavoie's (G&L's) *Monetary Economics*. The concept and term arise throughout the book — notably in a lengthy up-front section addressing firms' book versus market values, and net worth (though abjuring the term "book value").[25] They also invoke it, though only in passing, in Appendix 12.1, which lays out the sectoral balances construct (again, not by that name): "NAFA [net accumulation of financial assets] is different from the increase in the wealth of households, ΔV, since it does not incorporate capital gains."[26] (p. 491) Page 33 offers a full-throated statement of their intentions: "This full integration will become possible only when capital gains are added to the transactions matrix." That integration is well illustrated in the bottom sections of Tables 2.6 and 2.7 (pp. 39 and 44), and in the revaluation matrix of the Growth model, Table 11.2 (p. 380). Notably, tables 2.7 and 11.2 are the only matrixes in the book that don't balance to zero across the bottom. They balance to net worth.[27]

Other significant recent work on balance-sheet-complete modeling includes G&L-style SFC models by Genarro Zezza and Michalis Nikiforos,[28] and Jacob Robbins' December 2018 "Capital Gains and the Distribution Of Income in the United States,"[29] which employs a measure called Gross National [accrued] Capital Gains" (GNKG), and seeks to accommodate balance-sheet-complete wealth accumulation within a neoclassical model.

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[24] brookings.edu/wp-content/uploads/2019/09/Saez-Zucman_conference-draft.pdf

[25] Section 2.2.2 (pp. 27–31), "The balance sheet of production firms."

[26] Terminology is again meaningful and significant here. G&L's "NAFA" is net *accumulation* of financial assets — the financial account's net *acquisition* of financial assets (also often called NAFA) minus net acquistion of liabilities. G&L's NAFA equals net lending/borrowing, financial account — the measure depicted in sectoral balances graphs. Clearer usage might be: net asset accumulation - net liability accumulation = net *net* asset accumulation — G&L's usage. This measure is a "volume" change, separate from any valuation changes.

[27] Capital gains are also included in Table 5.2, but as "only as a memo…capital gains have not been included within the definition of disposable income, but *this of course is a matter of convention*." (Emphasis added.) Capital gains are not part of Model LP being discussed in that section.

[28] For an overview, see their 2017 Levy Economics Institute working paper, "Stock-flow Consistent Macroeconomic Models: A Survey." levyinstitute.org/pubs/wp_891.pdf

[29] users.nber.org/~robbinsj/jr_inequ_jmp.pdf

Deriving Comprehensive Income

Perhaps the main reason for the rarity of balance-sheet-complete economic modeling and theory is the absence of a labeled, headline measure for comprehensive income in the national accounts. Even the IMAs don't assemble such a measure. But doing so is fairly straightforward based on the IMAs' complete accounting construct. Figure zz shows such an effort for the household sector. It's simply a condensed rearrangement, with some relabeling, of the IMAs' S.3 household table.[30] As a descriptive model, it's "mapping the same territory," using the same data, but the map is drawn using somewhat different borders and labels.

	Household Income Sources and Uses	2017	2018	1960–2018	% of Comprehensive income	% of Primary income
	Billions, nominal dollars					
1	**Sources (Comprehensive income)** **Labor + property + transfers**	**24,853**	**17,920**	**447,245**	**100%**	**131%**
2	**Labor Compensation**	10,412	10,928	232,290	52%	68%
3	Wages and Salaries	8,462	8,888	189,844	42%	55%
4	Employers' social contributions	1,950	2,040	42,446	9%	12%
5	**Plus: Primary property income**	5,204	5,571	110,095	25%	32%
6	Operating surplus, net (homeowners' "profits")	803	839	17,029	4%	5%
7	Interest	1,553	1,704	41,017	9%	12%
8	Dividends including S-corp pass-through profits	1,130	1,227	18,002	4%	5%
9	Partnerships and sole proprietorships pass-through profits	1,717	1,801	34,047	8%	10%
10	**Equals: Primary income**	15,615	16,500	342,385	77%	100%
11	**Plus: Other property Income**	7,868	16	83,744	19%	24%
12	Nominal holding gains/asset revaluation	7,564	-814	65,821	15%	19%
13	Other Volume Changes	304	830	17,922	4%	5%
14	**Equals: Comprehensive market income**	23,483	16,515	426,129	95%	124%
15	**Plus: Net Transfer income**	1,371	1,405	21,117	5%	6%
16	Social benefits and other transfers received	2,848	2,971	53,017	12%	15%
17	Social contributions and other transfers paid	-1,477	-1,567	-31,901	-7%	-9%
18	**Uses**	**15,940**	**16,704**	**342,041**	**76%**	**100%**
19	Taxes on income and wealth, paid	2,046	2,078	42,195	9%	12%
20	Interest paid	582	628	17,983	4%	5%
21	Consumption expenditures	13,312	13,999	281,863	63%	82%
22	**Change in net worth (Comprehensive net saving)**	**8,913**	**1,216**	**105,204**	**24%**	**31%**
	Addenda					
	IMAs' net saving	1,046	1,201	21,461	5%	6%
	Comprehensive property income	13,071	5,587	193,838	43%	57%
	Comprehensive non-property income	11,782	12,333	253,407	57%	74%
	IMA's disposable income	14,343	15,209	303,857	68%	89%
	Comprehensive disposable income	22,808	15,842	405,050	91%	118%

Figure zz. Detail; the columns extend back to 1960. The 1960–2018 totals, and percentages derived from them, seek to provide a sense of the relative magnitudes for different measures over

[30] A somewhat different arrangement and presentation would be useful for firms, because they don't receive wages or do consumption spending, they do issue dividends, their saving equals their disposable income (equals retained earnings), they issue and sell ownership equity (and do share buybacks), and their pertinent bottom-line balances are book value and market capitalization, not net worth. (cf G&L, p. 31: "the measured net worth of firms is of no practical significance. Indeed, in the book, no behavioural relationship draws on its definition.") Somewhat different treatments would also be appropriate for financial and government sectors.

the long term. Since all measures are nominal, recent years and decades dominate in the totals. The complete table with source data and derivations is available as a Google Sheet here.
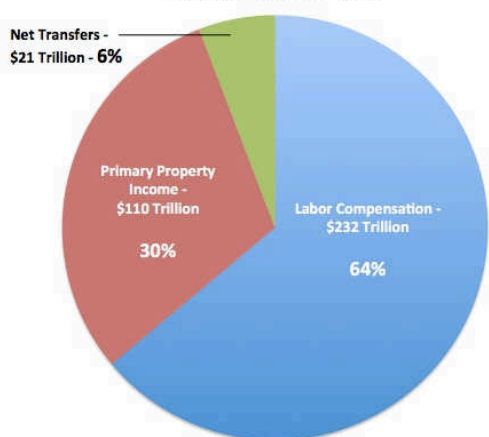
Notably, this presentation doesn't estimate production, value-added, or fixed-capital formation. It simply shows changes to households' accounted monetary wealth, and the "economic flows" that explain them.[31]

The accounting choices behind these measures (labeling and categories) are detailed in the Appendix. But one significant departure from the IMAs' "Net national income/Balance of primary incomes" bears highlighting here. The IMA measure treats interest payments as "uses of property income," negative income. This negative-income treatment effectively makes $18T in income invisible. (The Flow of Funds tables use this treatment as well.) Here, interest payments are included instead under Uses, to give a more complete picture of property, primary, and comprehensive income. So this primary income measure is about 5% higher than the IMA measure. Otherwise, it is the same as the NIPA, FOF, and IMA standard measures of primary sectoral income.
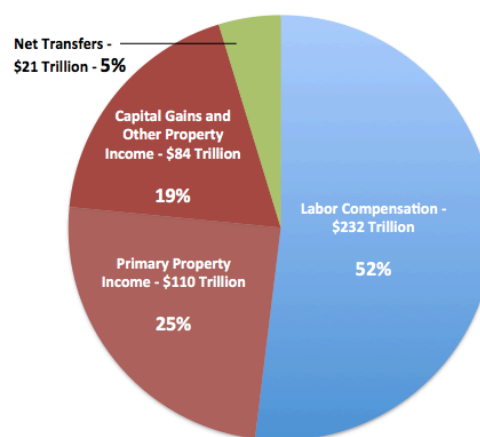
Comprehensive Income in Pictures

This accounting re-arrangement makes it easy to look at comprehensive versus primary income measures, as in the figures below. Since the revaluation gains included in comprehensive income are by their very nature owners' receipts of property income, the shares of labor/earned income versus ownership/unearned income are quite different.

Shares of Primary Household Income - $363T
Before taxes, 1960–2018

Net Transfers - $21 Trillion - **6%**
Primary Property Income - $110 Trillion **30%**
Labor Compensation - $232 Trillion **64%**

Shares of Comprehensive Household Income - $447T
Before taxes, 1960–2018

Net Transfers - $21 Trillion - **5%**
Capital Gains and Other Property Income - $84 Trillion **19%**
Primary Property Income - $110 Trillion **25%**
Labor Compensation - $232 Trillion **52%**

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[31] This treatment ignores household-sector borrowing and loan payoffs, which expand/contract the household-sector balance sheet, affecting assets and liabilities equally, with no accounting effect on net worth or any measure of income (ignoring loan writeoffs). Additional rows or an addendum table could be added to tally these asset/liability changes.
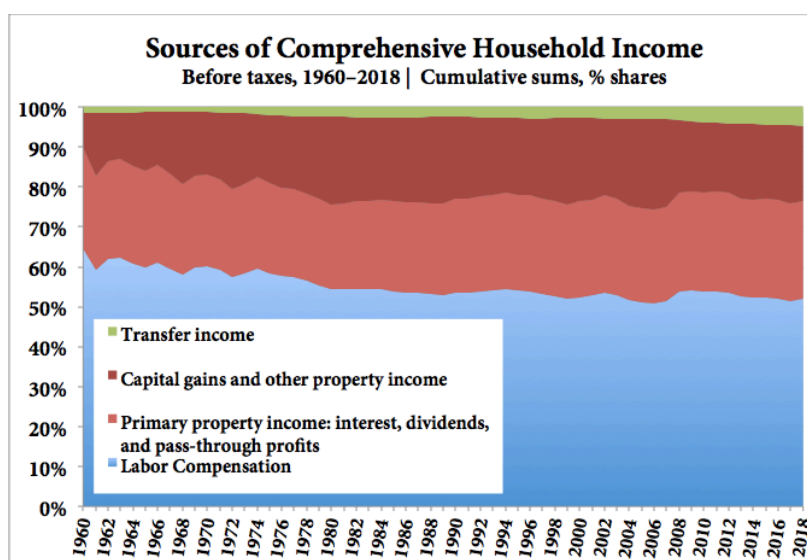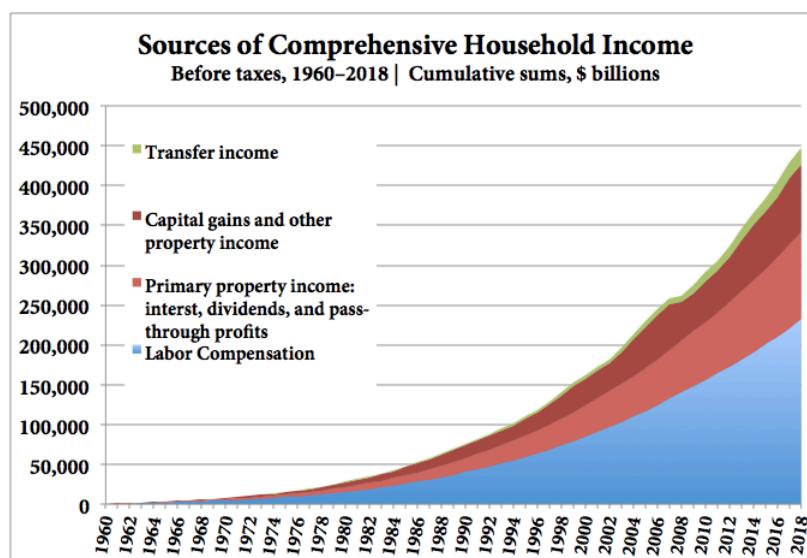
It's also worth noting that approximately 60% of U.S. household wealth is inherited.[32] So approximately 25% of comprehensive income is unearned income received for having unearned wealth.

Capital gains make comprehensive income quite volatile, though annual capital gains are almost always positive, or rarely near zero. 2008 is the big exception.
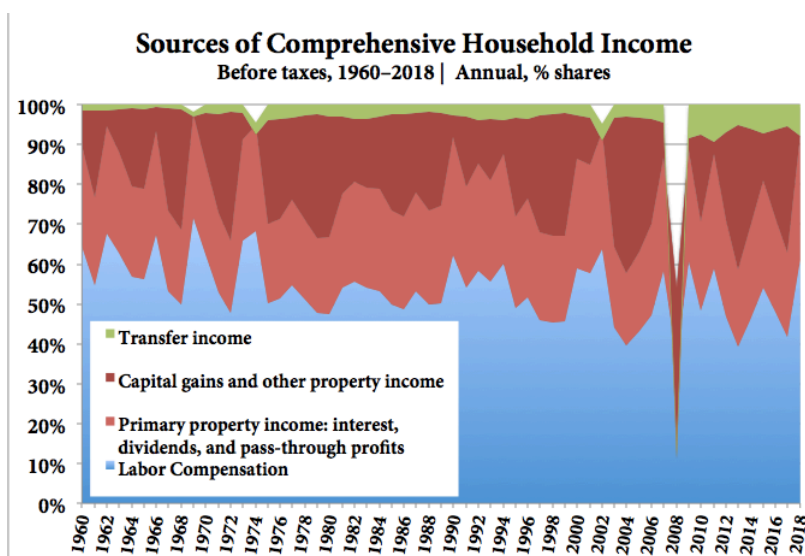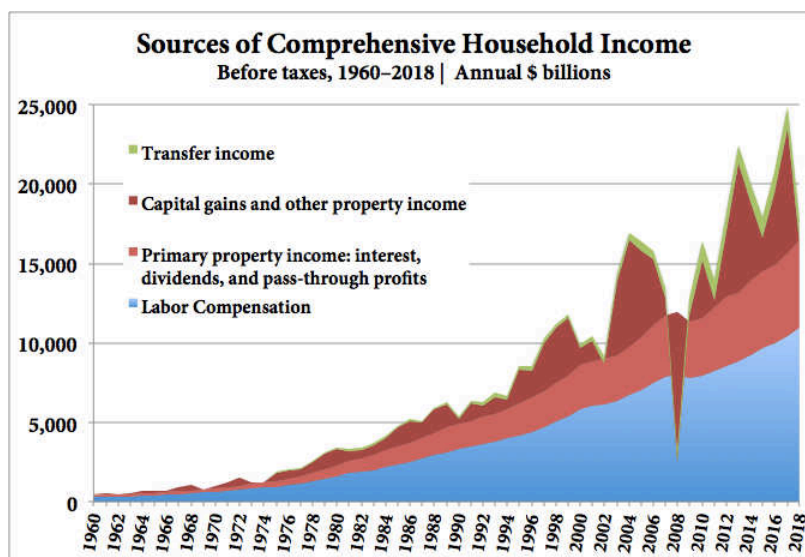
Viewing annual comprehensive income components as cumulative sums provides a smoothed, long-term representation of asset accumulation.

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[32] Alvaredo, Facuno, Garbinti, Bertrand, and Piketty, Thomas, 2017. "On the Share of Inheritance in Aggregate Wealth: Europe and the USA, 1900–2010." *Economica* 84, 239–260. p. 240.

Sources of Comprehensive Household Income
Before taxes, 1960–2018 | Cumulative sums, $ billions

- Transfer income
- Capital gains and other property income
- Primary property income: interst, dividends, and pass-through profits
- Labor Compensation

Sources of Comprehensive Household Income
Before taxes, 1960–2018 | Cumulative sums, % shares

- Transfer income
- Capital gains and other property income
- Primary property income: interest, dividends, and pass-through profits
- Labor Compensation

The property-income *share* of comprehensive income is also quite volatile. Here it's shown along with two standard BEA measures of "capital" income: share of GDP, and of nonfarm business income.
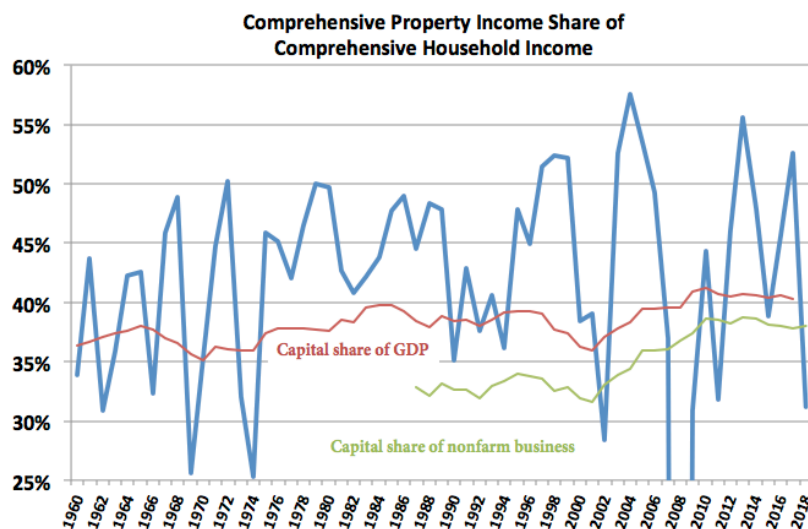
Figure ZZ. Capital share of GDP: fred.stlouisfed.org/graph/?g=wE1Y Capital share of nonfarm business: fred.stlouisfed.org/graph/?g=wGfg [33]

Looking at comprehensive saving — new wealth holdings/accumulation as a percent of comprehensive income — we're presented with a very different picture from the BEA's personal saving rate, and potentially a very different understanding.
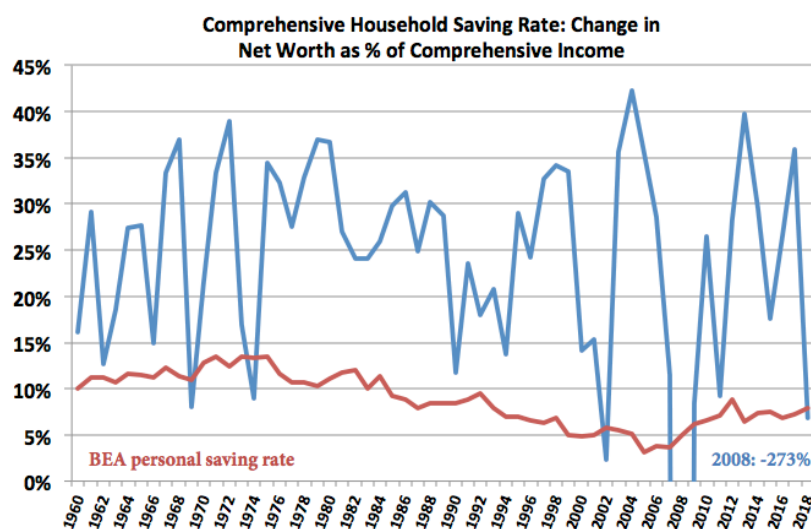

Figure zz. BEA personal saving rate: fred.stlouisfed.org/series/PSAVERT

Taxes as a percent of income also paint a very different picture.

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[33] Note that "under the hood," these BEA measures attempt to categorize a portion of property income ("proprietors'" mixed income) as labor compensation for "productive" owners; they use very different methodologies. An equivalent adjustment of the comprehensive household income share — necessarily somewhat arbitrary — would shift the blue line down a few points at most.
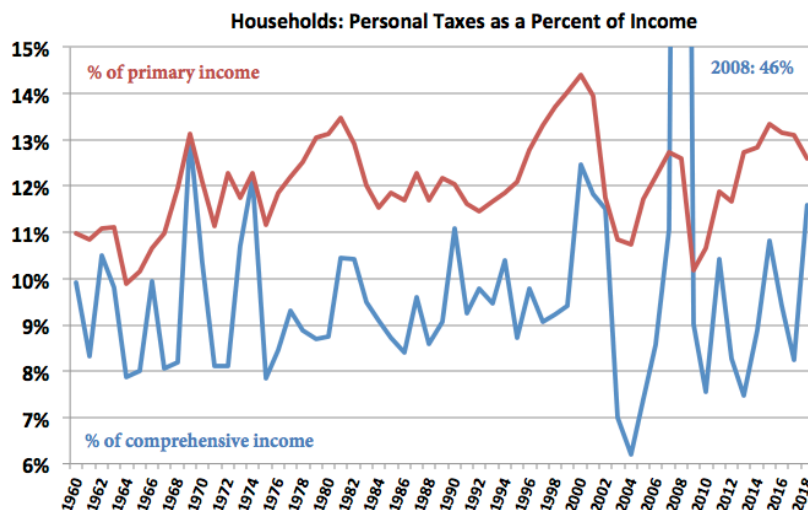
Figure zz. The tax measure in both series is the IMAs' "Taxes on income, wealth, etc." (federal, state, and local), sometimes labeled "personal taxes." It does not include property or sales taxes; these only comprise about 10% of "total" household taxes. See Appendix.

Given the importance of federal debt in economic discourse, modeling, and measurement, it's also useful to view that measure relative to measures of accumulated national wealth — as opposed to or in addition to the commonly used denominator, GDP.
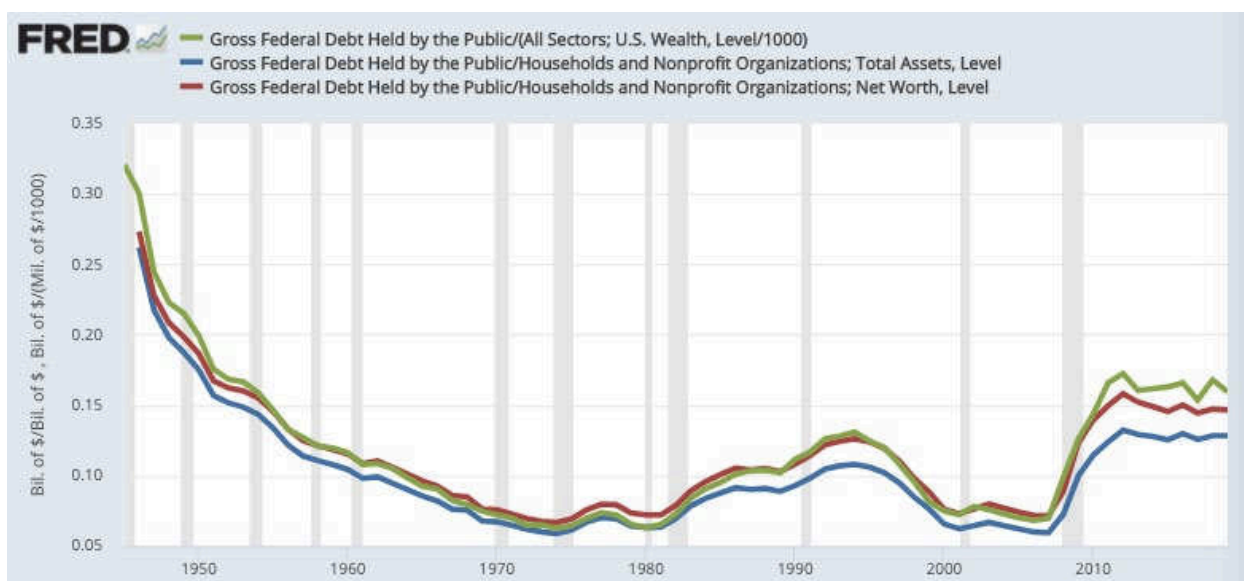

Figure zz. Source: fred.stlouisfed.org/graph/?g=DHs9

The measures pictured here are examples of potential insights arising from comprehensive income and balance-sheet-complete wealth accounting. They suggest important possibilities for economic theory and modeling based on these purely monetary measures — avoiding the vexed national accounting theory and practice required to estimate "real" capital accumulation, and

likewise to map "functional," "factor" shares of national income onto household monetary income shares.[34]

Appendix: Accounting for Comprehensive Income

The spreadsheet shown in Figure zz, which includes the source data and derivations from the IMAs' household Table S.3, is available at this link.

Some of the measures in that figure (and in the IMAs) merit further explanation. The treatment already mentioned, of interest payments as "uses," rather than negative income as in the IMAs, is the primary difference. This choice means that primary income in this treatment is about 5% higher than the IMAs' measure.

Property income. This treatment tallies what is here called primary property income plus other property income (equals comprehensive property income).

Operating surplus. Unlike the IMAs, this presentation includes households' net operating surplus as part of property income, rather than in its own standalone category. This measure tallies homeowner/occupiers' imputed "landlord profit," from renting their residences to themselves. (But see Interest Paid, below.) Both notionally and in practice, it's compensation for ownership.

Dividends, profits, and pass-throughs. These IMA measures are simply renamed to clarify their sources. The IMAs' "dividends" measure also includes pass-through profits from S-corps whether distributed or not; S-corps are included in the "corporate" sectors. In other words, the IMAs' "Distributed income of corporations" includes significant profits that *aren't* distributed. An alternative approach would break pass-through S-corps out from C-corps, and include them with other (non-"corporate") pass-through firms — partnerships and sole proprietorships.

"Withdrawals from income of quasi-corporations" *are* pass-through profits from the noncorporate nonfinancial firms sector: partnerships[35] and sole proprietorships. (This pass-through transfer means the noncorporate nonfinancial firms sector in the IMAs shows zero saving/retained earnings.)

Mixed income. There are certainly tricky "mixed income" issues related to profits and pass-throughs. To what extent are partnership, sole-proprietor, and S-corp profits properly viewed as

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[34] As an example of purely monetary modeling based on the IMAs' modern national wealth measures, see Roth, Steve, "How downward redistribution makes America richer: An empirical, 'money view' model of spending, wealth concentration, and wealth accumulation." *Real-World Economics Review*, issue no. 95, March 2021, 42–61. paecon.net/PAEReview/issue95/Roth95.pdf

[35] This also includes limited liability *companies* (LLCs, which are technically not "corporations") that have made the IRS election to be treated as parterships (vs. S-corps). These non-"corporate" partnerships notably include most private equity funds, plus professional partnerships including doctors, lawyers…and accountants. (Hedge funds' profits — they're mostly partnerships — are also largely included in household-sector accounting, though their flows and holdings are pretty impenetrably buried within multiple measures.)

compensation for owners' valuable work? But it's worth noting that C-corp dividends plus S-corp, partnership, and sole-proprietorship pass-through profits *combined* only comprise 11% of comprehensive income (15% of primary income). Allocating a portion of that to workers' earned income (necessarily somewhat arbitrarily) only shifts worker vs owner shares by a few percentage points, at most.

Other Changes in Volume. Of this category ($18T, 4% of comprehensive income), a third comes from the statistical discrepancy: Net financial assets in the financial account increased more than capital in the capital account. That additional increase is added to balance-sheet net worth via this measure. Another third is from Net investment in consumer durable goods (which arguably should be treated as net capital formation instead, as it is in the FOF accounts, but not in the NIPAs or IMAs). The final third is Other [other] volume changes. Disaster losses are a small additional category. None of these categories qualifies as earned labor income, so it's all included here under Other property income.

Nominal holding gains. This measure is net of capital losses.

Transfers. This presentation shows transfers received net of transfer payments, rather than payments being included under uses. (The gross received and paid amounts are broken out.) Most of these transfers are social, government transfers (95% of receipts and 87% of payments). Most of the receipts are "paid for" by household contributions, mostly straight out of earnings/paychecks, and are best viewed as deferred earnings. The net remainder best represents households' "unearned" transfer receipts from government — appropriate because transfers by definition are made with no (expectation of) reciprocal receipts in cash or kind.

Saving. This troublesome term is quite straightforward and intuitive when depicted as comprehensive saving. It's just change in net worth. It's also vastly larger than the standard primary saving measure. Over six decades it shows $66T in wealth accumulation, change in net worth, that's unexplained by primary saving. (Net capital transfers, by the way, are only about 0.1% of income.)

Disposable income. Comprehensive disposable income subtracts taxes from comprehensive income. It's equivalent to John Hicks' measure of sustainable disposable income in *Value and Capital* (p. 182 e.g. in the 1946 edition) — how much can be spent while maintaining real net worth — but in nominal terms. After correcting for interest paid to get an apples-to-apples comparison with the IMAs, the comprehensive measure reveals $49T more disposable income over six decades than the IMAs' primary disposable income — all "disposable" at the discretion of property owners who receive the extra property income.

Comprehensive non-property income. This measure includes labor compensation and net transfers received. It's the non-property share — useful for comparing comprehensive property income to all other household income.

Interest paid. As discussed under Primary Income above, the IMAs treat interest paid as "uses of property income," so as negative income. That bears unpacking. This measure includes mortgage interest plus interest on consumer (credit-card and car/boat loans), and student-loan interest, etc. Theoretically, mortgage interest should be treated as uses of *rental* property income (actual income for landlords and imputed for owner-occupiers), and deducted from operating

surplus so that measure depicts landlord profits. (The BEA's "Rental income of persons," NIPAs Table 7.9, *does* depict landlord profit this way: as net income or earnings *after* interest payments.)

Non-mortgage interest, on the other hand, is very hard to construe as uses of *property* income. Interest on auto loans, eg, *might* be construed as uses of property income if the IMAs treated durable-goods purchases as capital formation, but that would require imputing the value of annual vehicle services as income (similar to the owner-occupier treatment), depreciating vehicles' value (CFC), and including it all in operating surplus.

Rather than completely re-jiggering the IMAs' treatment and greatly confusing the accounts here, interest paid including mortgage interest is all just posted under uses. This means "operating surplus" here (and in the IMAs) is rather misrepresentative of homeowners' owner-occupier-landlord "profits."

Taxes. This is the IMAs' measure of "Current taxes on income, wealth, etc." It overwhelmingly consists of federal and state income taxes, plus a small amount of estate/wealth taxes. Households' sales and property taxes (only about one-tenth the amount of income/wealth taxes) are not included; they're "Taxes on [products,] production and imports" which are "pre-deducted" in the IMAs, treated as negative income. Taxes on C-corp profits are of course not included here, though they could be imputed to equity-owning households as the firms' owners in some treatments, notably in efforts to examine the distribution of taxes and after-tax income.

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