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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. household "Haig-Simons" income (formerly the "preferred" income measure among economists and national accountants), based on the Integrated Macroeconomic Accounts. The comprehensive measure is 23% higher than national accounts' "primary" household 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 **transactions, revaluations, and other changes in volume**. The new terminology brings the Financial Accounts of the United States into better alignment with international guidelines in the System of National Accounts 2008 (SNA2008).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.

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.

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 sectors' asset holdings, and the total stock of assets. But that price-driven increase — “(re)valuation” 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 widely-depicted “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, which increase steadily, showing only one large (brief) drawdown since 1960, in 2008 (Figure 6).

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 practices — 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

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) — exchanged 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 mark-up-to-market accounting events are what add assets to wealthholders' brokerage account statements (updated instant by instant), 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 measures of both valuation and volume

Economist remain largely unaware of the IMAs, and their import. A 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 (Figure 1), plus a simplified diagram depicting the IMAs’ derivation of change in net worth from period start to period end (Figure 2), helps clarify the differences between the IMAs, the Flow of Funds, and the NIPAs.

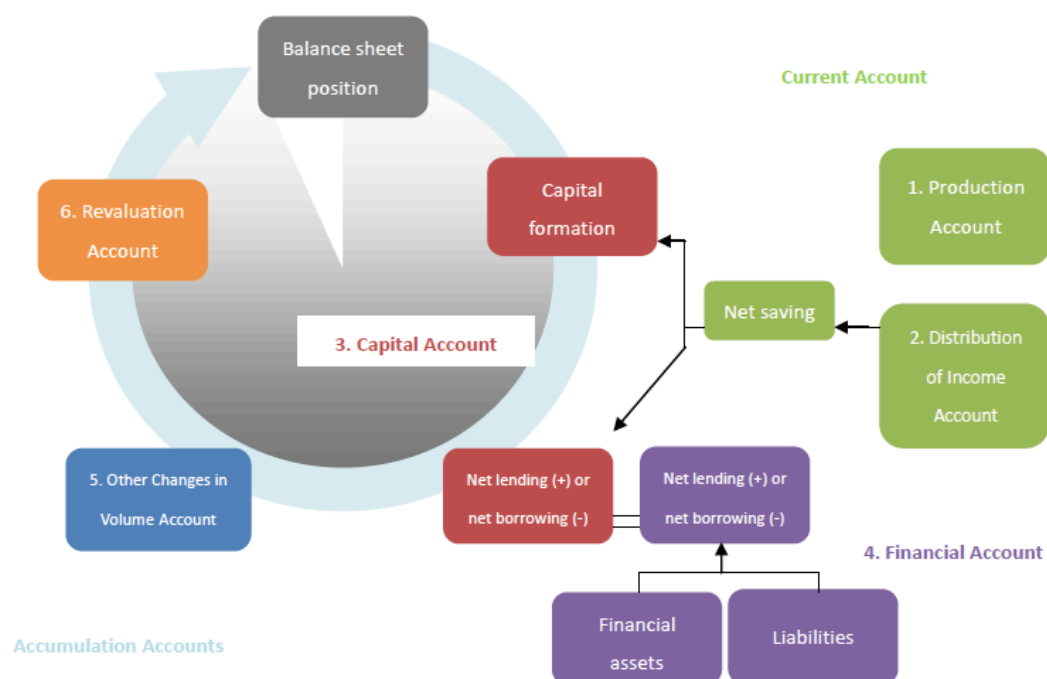


Figure 1. The IMA's sequence of accounts.⁶

changes. 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.

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.

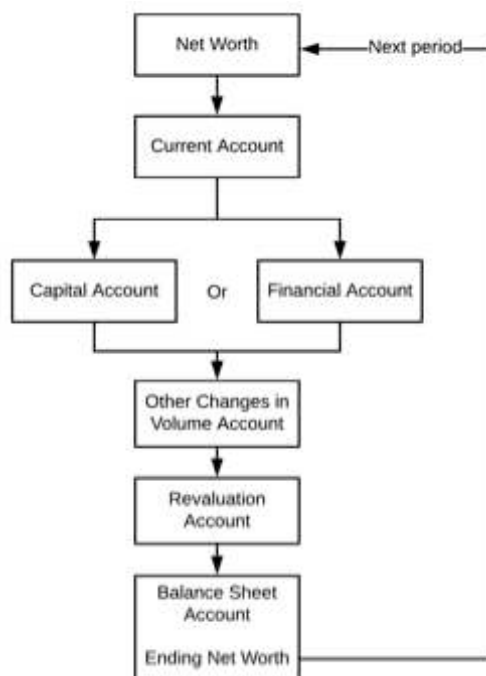


Figure 2. The accounting pathway for the IMAs' derivation of change in sectoral net worth.

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” — plus a range of “statistical” data on the financial sector(s), especially banks). The IMAs complete the accounting of “economic flows” (hence wealth accumulation) by 1. adding the Revaluation and Other Changes in Volume accounts for all sectors, 2. including nonfinancial assets in its tallies, and 3. tallying complete balance sheets for all sectors.

Here’s the IMAs’ precise derivation of change in net worth — line 96 from table S.3.a, the IMAs’ Household-sector table, as an example:

“Change in net worth (lines 32+38+78+95)”

And here, those line numbers expanded:

Starting Net Worth

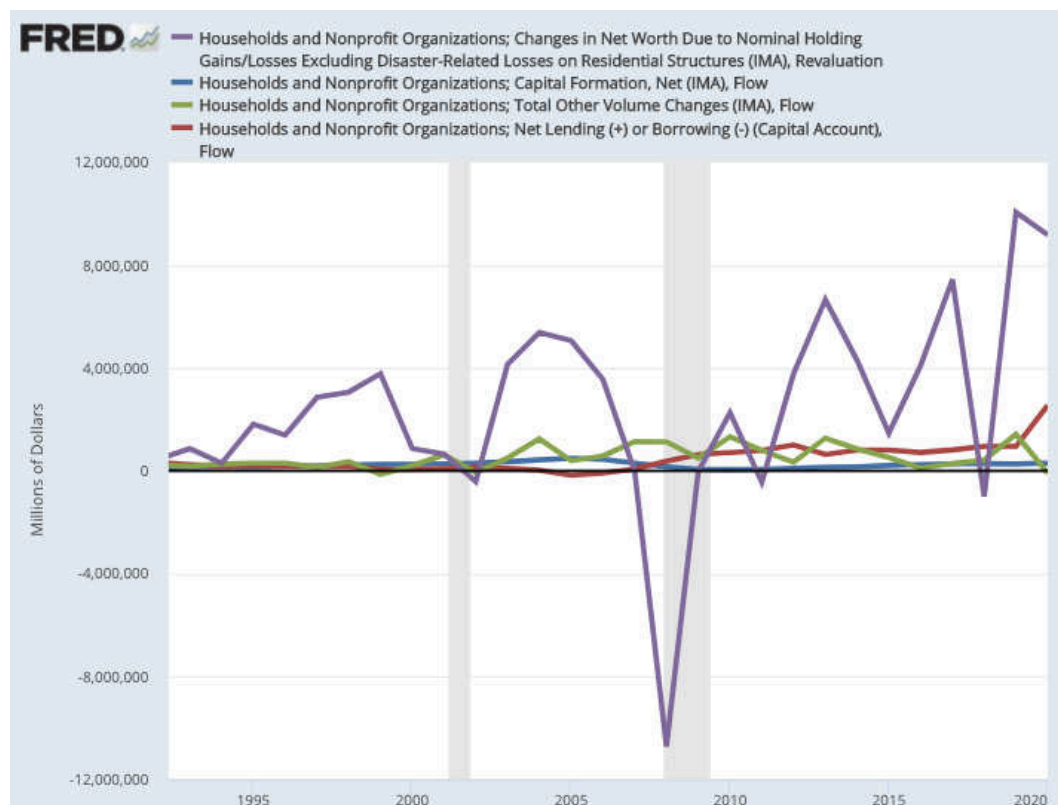
32: +Capital formation, net, Capital account

38: + Net lending (+) or Net borrowing (-), Capital account⁷

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 ultimate balance-sheet bottom line: change in monetary net worth — total assets minus total liabilities.

(N.B.: Net capital formation - Net borrowing = Net Saving, Current account)
 78: + Total other volume changes, Other Changes in Volume account
 95: + Changes in net worth due to nominal holding gains/losses, Revaluation account
 = Ending Net Worth

A plot of those four measures using the household sector as an example (Figure 3) imparts a sense of their relative magnitudes. (The household sector is shown because it's effectively the top of the accounting-ownership pyramid; the market-cap value of all domestically-held U.S. equities is included as assets on the household balance sheet.)



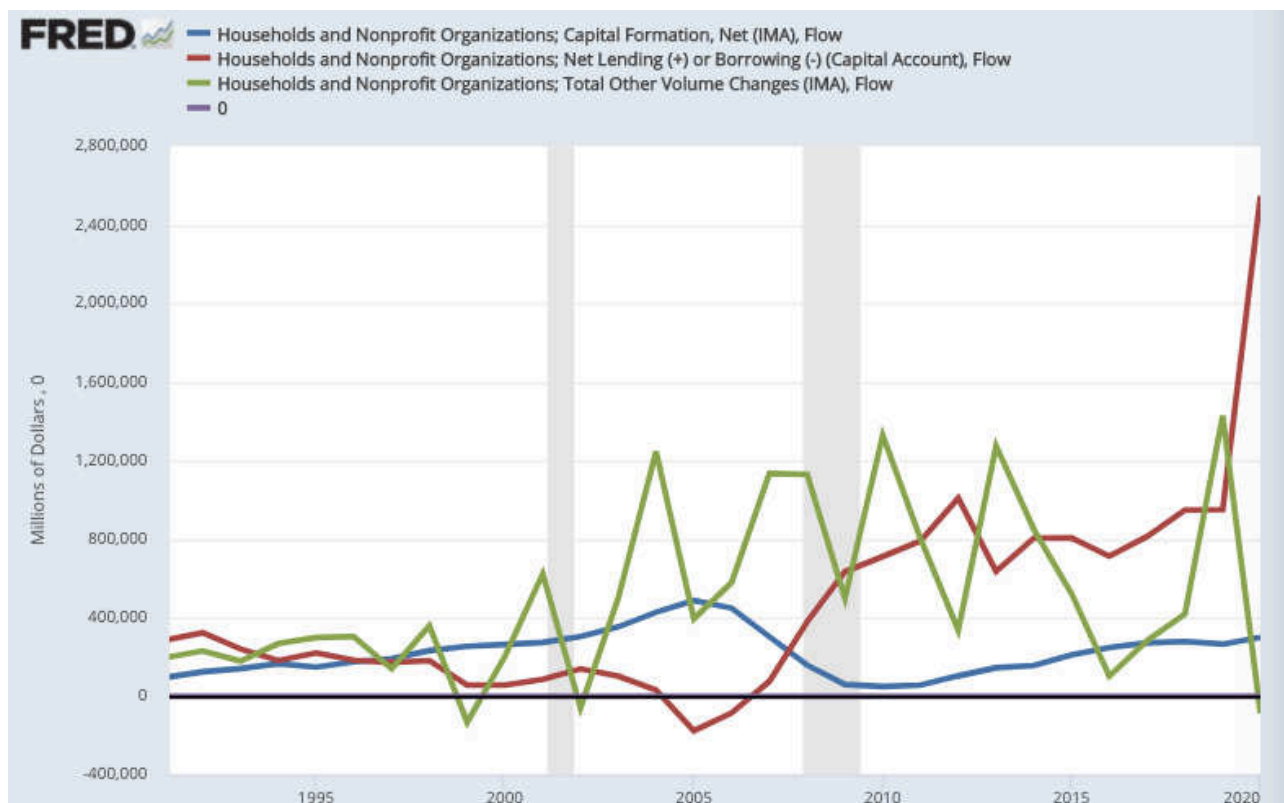


Figure 3. Derivation measures for changes in household net worth. IMAs Household Table S.3. The bottom panel zeroes out holding gains to give a better picture of the other three measures. (N.B.: in the IMAs, the small measure of disaster losses is tallied via the Other Changes in Volume account.) fred.stlouisfed.org/graph/?g=C6by

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,

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 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

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.)

Household vis-a-vis Firms' Capital Formation: Book versus Market value

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 quite variable book-to-market ratios, is perhaps irreducibly indeterminate/unpredictable.)

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 as they're marked to market (mostly, instantly by brokerages). 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, increase in book value, 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 (Figure 4).¹¹

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, share buybacks, and taxes paid; 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 equals their "disposable income." This effectuates 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 outstanding stock of financial assets *does not* equal the outstanding 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](https://eml.berkeley.edu/~saez/PSZ2020AppendixTablesII(Distrib).xlsx).

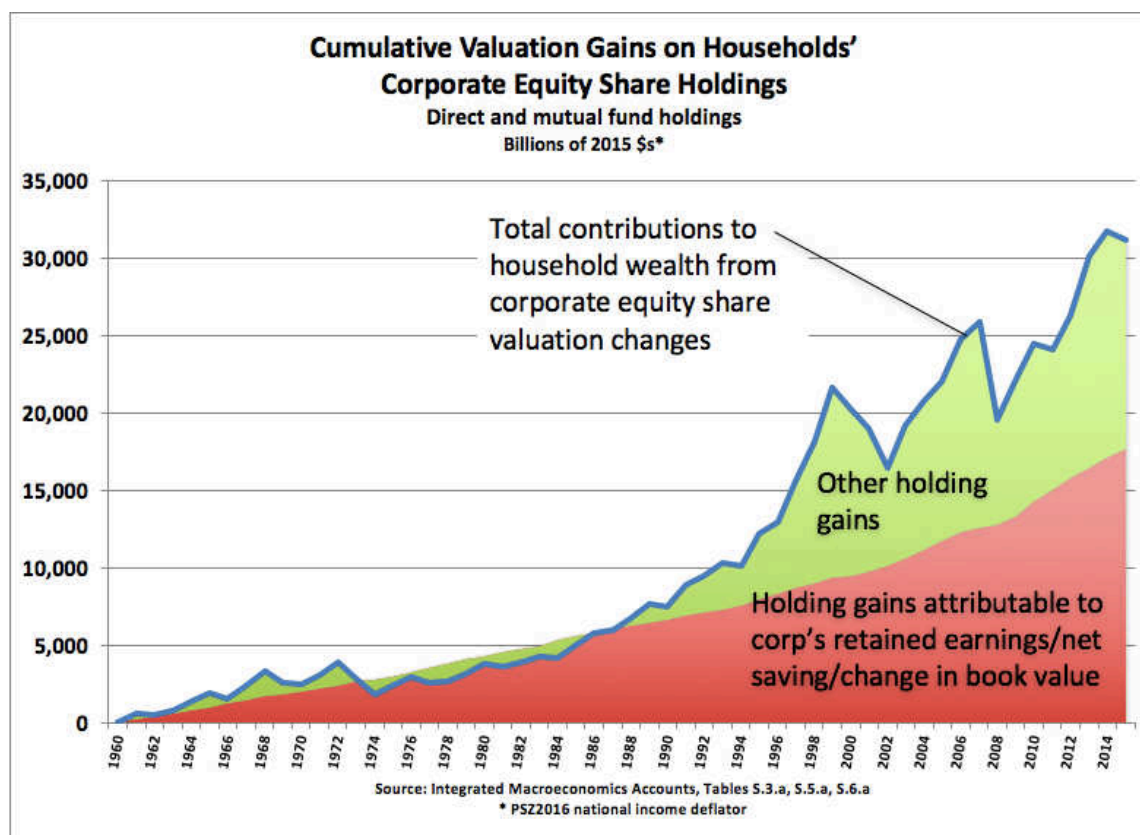


Figure 4. Annual measures for each series are inflation-adjusted prior to summing/addition, to estimate the ending cumulative sums in “real” or “current-cost” terms.¹²

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.

The accounting of comprehensive household income below (Figure 11) sidesteps or “leaps over” this issue of imputing corporate retained earnings to the households sector’s income and wealth. It simply treats holding gains as household income, whether they result from “volume” changes in firms’ retained earnings/book value, or “valuation” changes due to shifts in the equity markets’ prices/book-to-market ratio. Whatever the cause, when household equity-share gains are accrued via mark-to-market accounting events, equity-owning households have more assets and net worth.

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 national aggregate measures), the discrepancy between saving/investment/capital formation and changes in wealth is equally apparent (Figure 5).

¹² Cumulative-sum measures in this paper simply implement accountants’ standard “perpetual inventory method”: starting stock + inflows - outflows = ending stock, repeated period after period.

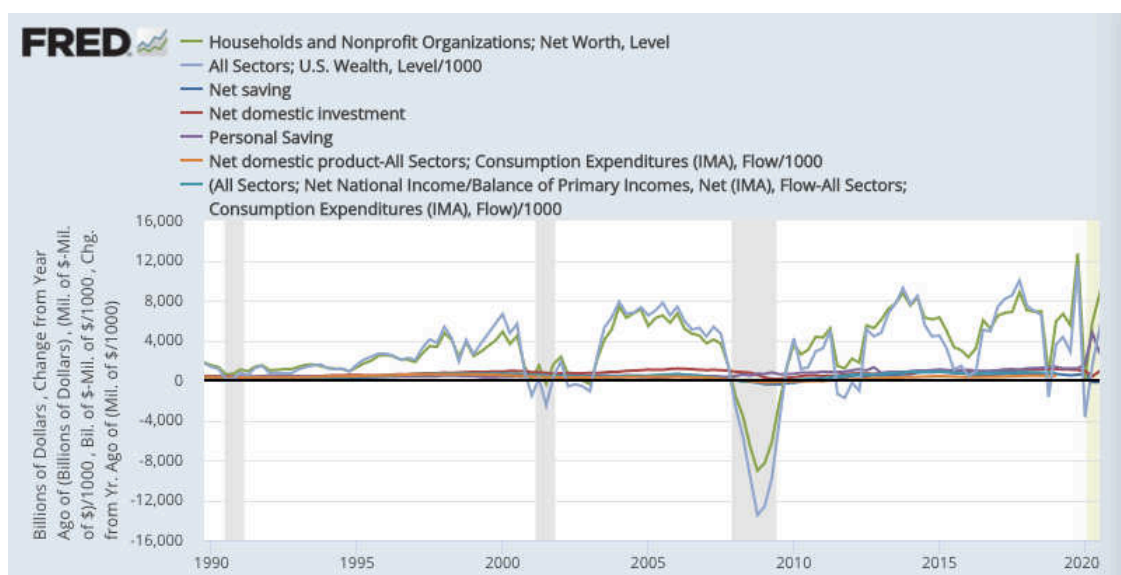


Figure 5. The top two lines depict quarterly changes in two alternate Fed measures of national wealth (table B.101 “U.S. Net Wealth,” and S.3 household Net Worth). The remaining measures are flows. All measures are in nominal dollars. Note that “net” measures here are all net of Consumption of Fixed Capital (depreciation); that consumption is “pre-deducted.” CFC + Consumption Expenditures could be called total or “gross” consumption.
fred.stlouisfed.org/graph/?g=CSDQ.

The discrepancy is perhaps more clearly depicted as cumulative sums (Figure 6).

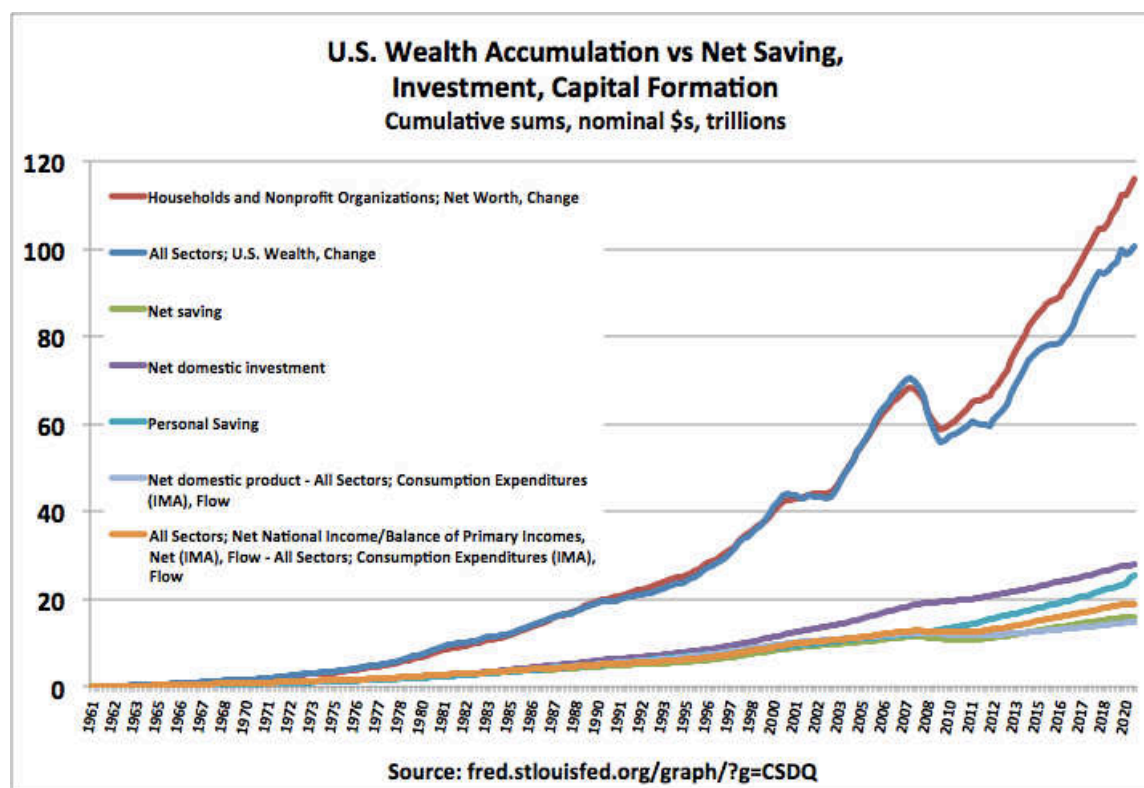


Figure 6. Measures of wealth and capital accumulation. Since these measures are all in nominal dollars, the righthand-side sums (e.g. \$118T in 2020 end-of-year household net worth) are dominated by accumulation over recent years and decades. fred.stlouisfed.org/graph/?g=CSDQ

Stock measures of wealth and capital, likewise, are very different (Figure 7). Measures of the capital stock are presented at inflation-adjusted “current” or replacement cost. (Employing perpetual-inventory accounting, as in the previous figure.)

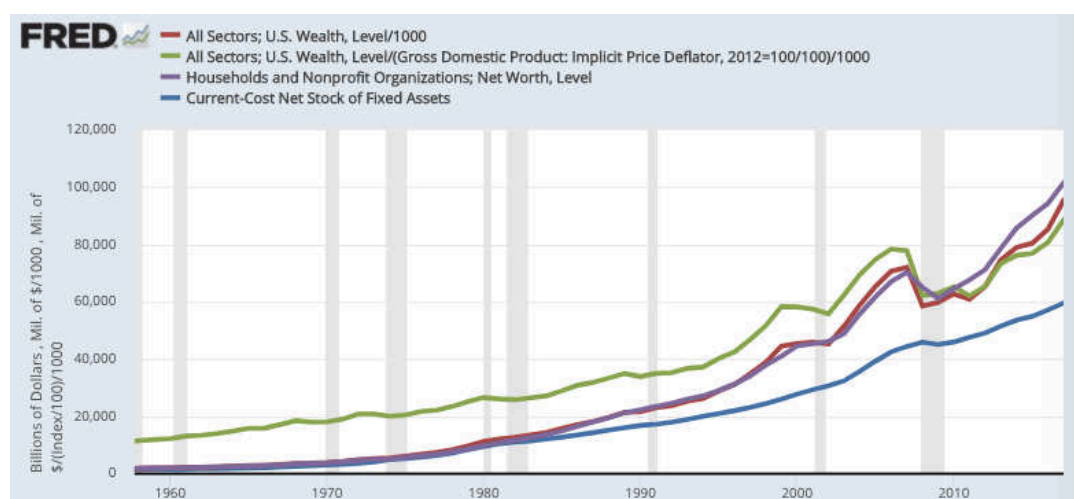


Figure 7. Stock measures of U.S. wealth and capital. The fixed-assets/capital measure here is in constant 2012 dollars. The other three measures are wealth estimates, with one also deflated for comparison using the GDP deflator, in 2012 dollars. fred.stlouisfed.org/graph/?g=DF2Q

Another construction depicting sources of new private-sector assets paints a similar picture (Figure 8) depicting the “ultimate” sources of new assets.

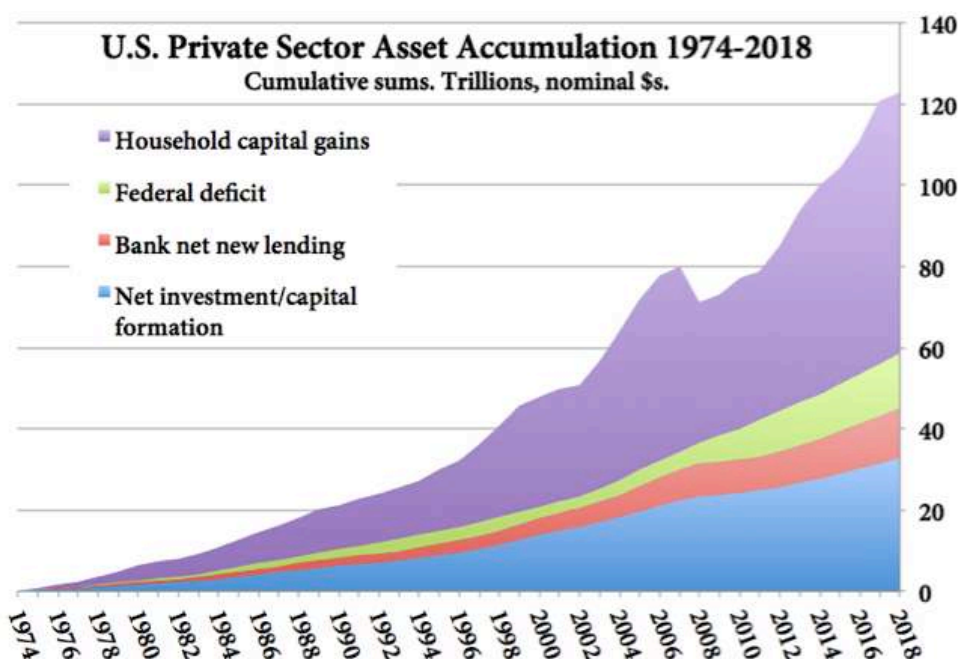


Figure 8. Source series: fred.stlouisfed.org/graph/?g=vAIu

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. 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”), is very different from wealthholders’ total return on balance-sheet assets, wealth. But both mainstream

and heterodox theories and models commonly, 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. Emphasis added.

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

No explanation is given for the sudden shift in terms; the capital/wealth 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). See Figure 9.¹⁵

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/econeg/articl/KotlikofSummers1981.pdf. To complicate this study, the authors’ wealth measures are not “directly” 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.”

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.”)

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

	Households		Firms		Total
	Workers	Capitalists	Current	Capital	
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.

Figure 9. *Flows and stock matrix from a neo-Kaleckian SFC model.*

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 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 a problematic result: when the words wealth or capital are used in these 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 Piketty's desire to "simplify the text" is

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."

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](https://doi.org/10.1257/aer.p20151066)

understandable, but the capital/wealth conflation arguably delivers confusion rather than simplicity.

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 (see “Transfers” in Appendix), 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

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

In this construction and usage, “saving” fully explains wealth accumulation.

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.

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 output, 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 balance-sheet-incomplete GDP-based measures.

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 paper²² (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 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.)

Directly addressing the issue of “Measuring Income for Distributional Analysis,” Joseph Rosenberg of the Urban-Brookings Tax Policy Center (2013) devotes a footnote to this topic.

Many annual economic income measures are based on the Haig-Simons definition of income—equal to current consumption plus the change in net wealth. However, data limitations and administrative constraints on the tax system (e.g., difficulty in including in the tax base the imputed rent on owner-occupied housing and capital gains on an accrual basis) make a full construction of Haig-Simons income problematic.²³

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

²³ Rosenberg, Joseph. “Measuring Income for Distributional Analysis.” Urban-Brookings Tax Policy Center, 2013. taxpolicycenter.org/sites/default/files/alfresco/publication-pdfs/412871-Measuring-Income-for-Distributional-Analysis.PDF

The opening sentence is surprising given how rare Haig-Simons is in recent decades' economics literature, but the rest highlights the difficulties at the tax-microdata level that have contributed to that rarity. The issue remains in 2020, in a footnote to the “choice of income” section of a BEA working paper for developing prototype distributional income accounts (Fixler, 2020).²⁴

Despite their understanding of comprehensive income, Piketty and company largely abjure it 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 (Figure 10).²⁵

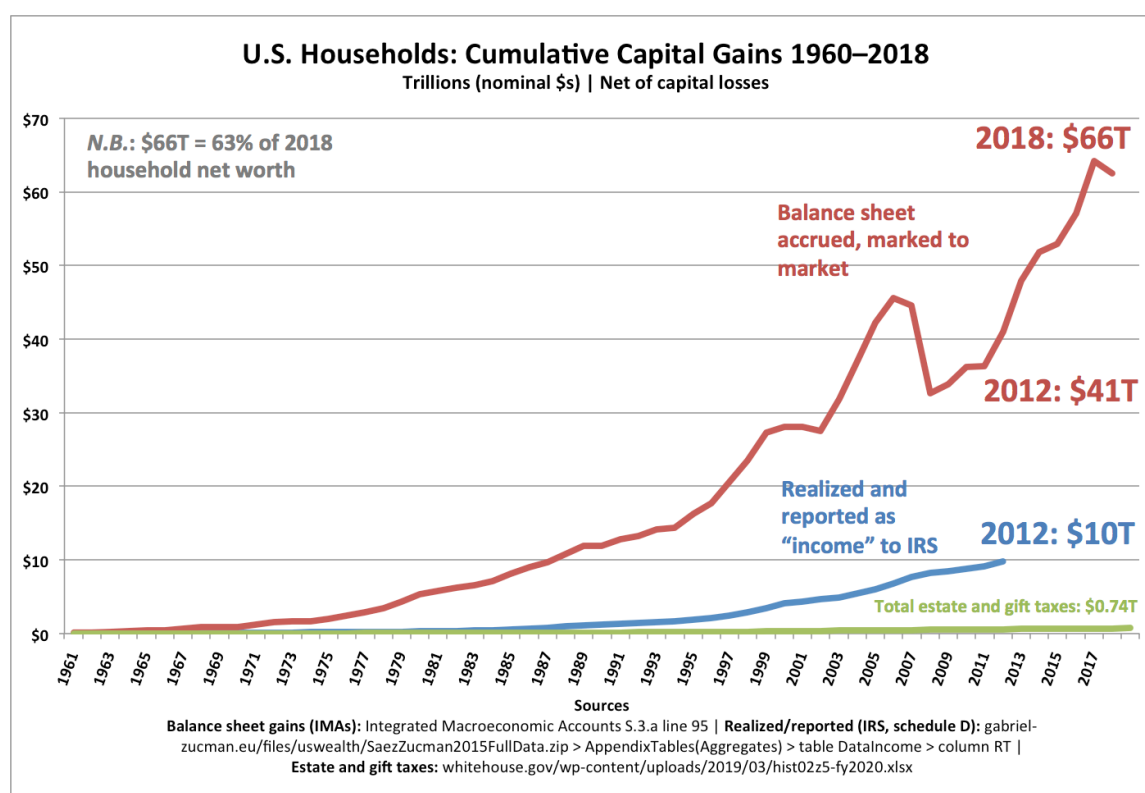


Figure 10. Realized and reported versus balance-sheet accrued capital gains.

²⁴ Fixler, Dennis, Marina Gindelsky, and David Johnson. “Measuring Inequality in the National Accounts.” BEA working paper, updated December 2020. Note 4, p. 2. bea.gov/system/files/papers/measuring-inequality-in-the-national-accounts_0.pdf

²⁵ Note that PSZ’s work on wealth levels, changes, and shares does necessarily incorporate unrealized capital gains “under the hood,” because their method is based on the relationship between observed wealth (changes) which have to include those gains, total rates of return for wealthholders, and capitalization 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.”²⁶ 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-cap values, and net worth (though abjuring the term “book value”).²⁷ 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.”²⁸ (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. 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 treated as income for modeling purposes in Model LP being discussed in that section, but the previous year’s change in wealth is included as a term in the consumption function (with a different multiplier than income).

Other significant recent work on balance-sheet-complete modeling includes G&L-style SFC models by Genarro Zezza and Michalis Nikiforos,²⁹ Patrizio Lainà’s 2019 “Money creation under full-reserve banking,”³⁰ and Jacob Robbins’ 2018 “Capital Gains and the Distribution Of Income in the United States,”³¹ which employs a measure called Gross National [accrued]

²⁶ brookings.edu/wp-content/uploads/2019/09/Saez-Zucman_conference-draft.pdf

²⁷ Section 2.2.2 (pp. 27–31), “The balance sheet of production firms.”

²⁸ 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 acquisition 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.

²⁹ For an overview, see their 2017 Levy Economics Institute working paper, “Stock-flow Consistent Macroeconomic Models: A Survey.” levyinstitute.org/pubs/wp_891.pdf

³⁰ Lainà, Patrizio. “Money creation under full-reserve banking: a stock-flow consistent model.” *Cambridge Journal of Economics*, Volume 43, Issue 5, September 2019, Pages 1219–1249, doi.org/10.1093/cje/bey034

³¹ users.nber.org/~robbinsj/jr_inequ_jmp.pdf

Capital Gains” (GNKG), and seeks to accommodate balance-sheet-complete wealth accumulation within a neoclassical model.

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 11 shows such an effort for the household sector. It’s simply a condensed rearrangement, with some relabeling, of the IMAs’ S.3 household table.³² As a descriptive accounting model, it’s a “map of 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
<i>Billions, nominal dollars</i>					
1 Sources (Comprehensive income)					
1 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%

³² 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 [treating outstanding equity shares at market value as “liabilities”] is of no practical significance. Indeed, in the book, no behavioral relationship draws on its definition.”) Somewhat different treatments would also be appropriate for financial and government sectors.

Figure 11. 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 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. And as discussed above, it doesn't need to consider whether equity holding gains are a result of firms' retained earnings (vs market share-price valuation changes). It simply shows changes to households' accounted monetary wealth, and the "economic flows" that explain them.³³

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 since 1960, invisible. (The Flow of Funds tables use this treatment as well.) Here, interest payments are posted 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. They impart a set of stylized facts that are quite different from those commonly accepted and employed by economists. Since the revaluation gains included in comprehensive income are by their very nature owners' receipts of property income, for instance, the shares of labor/earned income versus ownership/unearned income are quite different (Figure 12).

³³ 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.

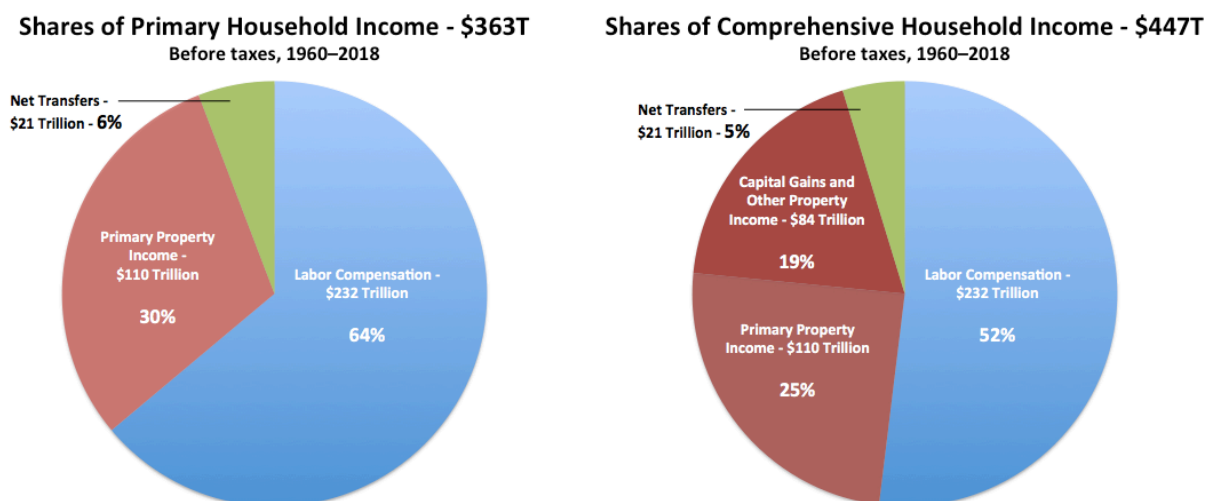
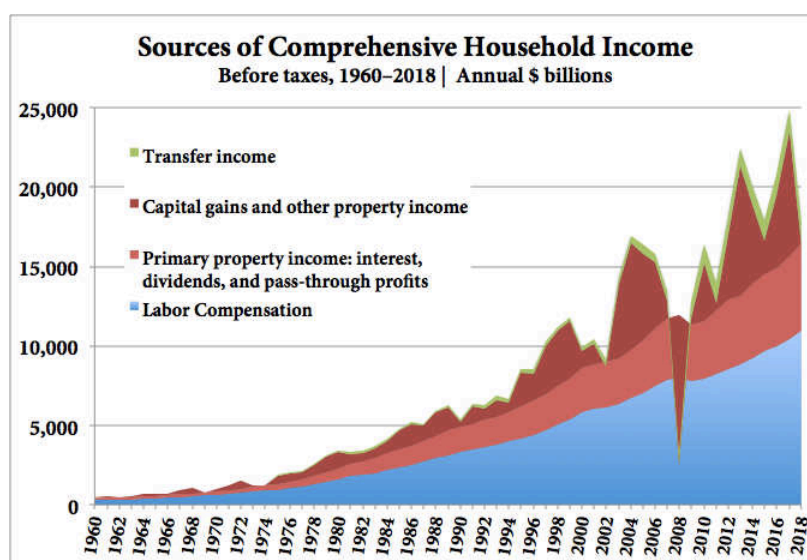


Figure 12.

It's also worth noting that approximately 60% of U.S. household wealth is inherited.³⁴ So approximately 25% of comprehensive household income is unearned property 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 (Figure 13). 2008 is the big exception.



³⁴ 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.

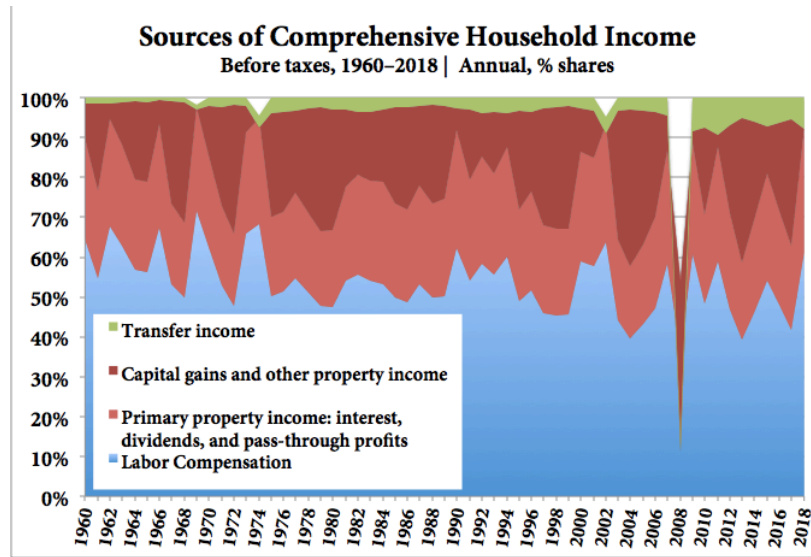
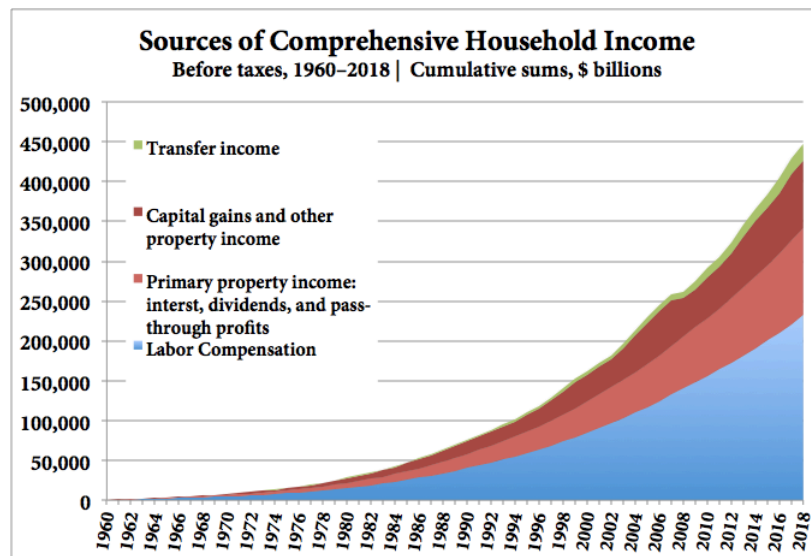


Figure 13. Sources of comprehensive income.

Viewing annual comprehensive income components as cumulative sums provides a smoothed, long-term representation of household asset accumulation (Figure 14).



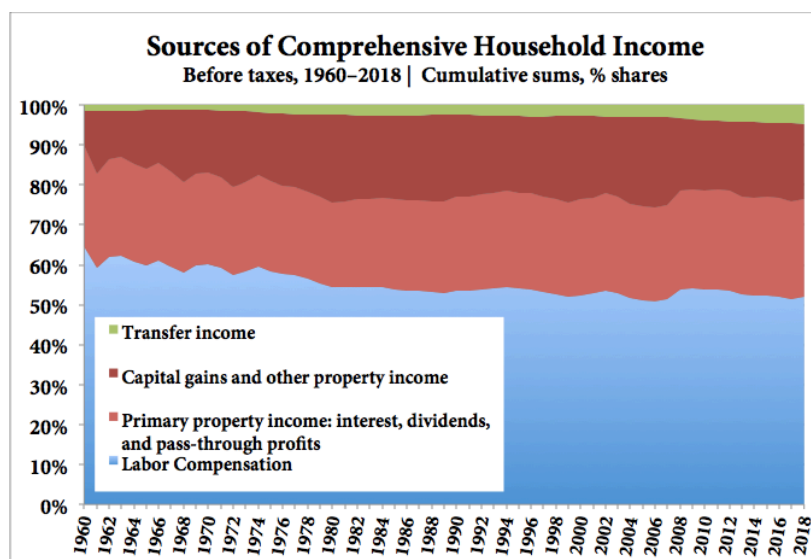


Figure 14.

The property-income *share* of comprehensive income is also quite volatile. Figure 15 depicts that, along with two standard BEA measures of “capital” income: share of GDP, and of nonfarm business income.

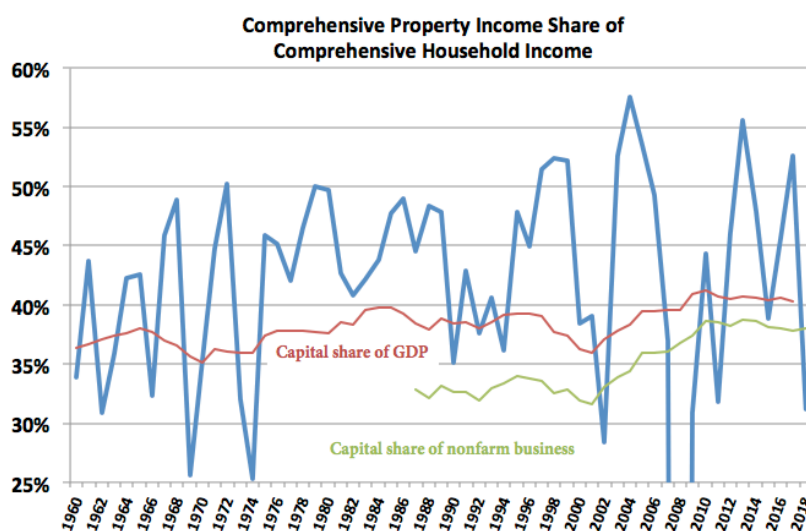


Figure 15. Capital share of GDP: fred.stlouisfed.org/graph/?g=wE1Y Capital share of nonfarm business: fred.stlouisfed.org/graph/?g=wGfg³⁵

³⁵ 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. PSZ make similar adjustments in the DINAs. An equivalent adjustment of the comprehensive household income shares — necessarily somewhat arbitrary — would shift the blue line down a few points at most.

Looking at our measure of “comprehensive saving” — wealth 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 16).

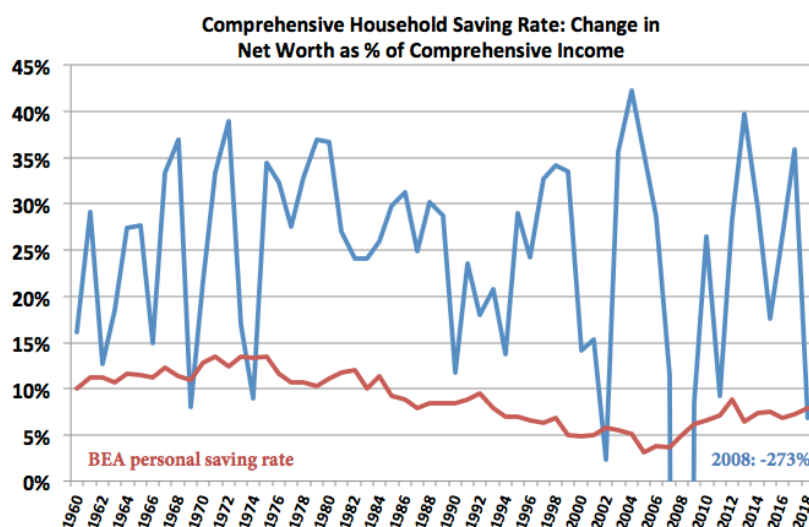


Figure 16. BEA personal saving rate — $1 - (\text{personal consumption expenditures} / \text{disposable income})$ — for comparison. From fred.stlouisfed.org/series/PSAVERT

If instead of saving and the “saving rate,” we instead focus on saving’s obverse, spending, we can assemble a more straightforward apples-to-apples view of things. Figure 17 depicts Personal Consumption Expenditures relative to income:

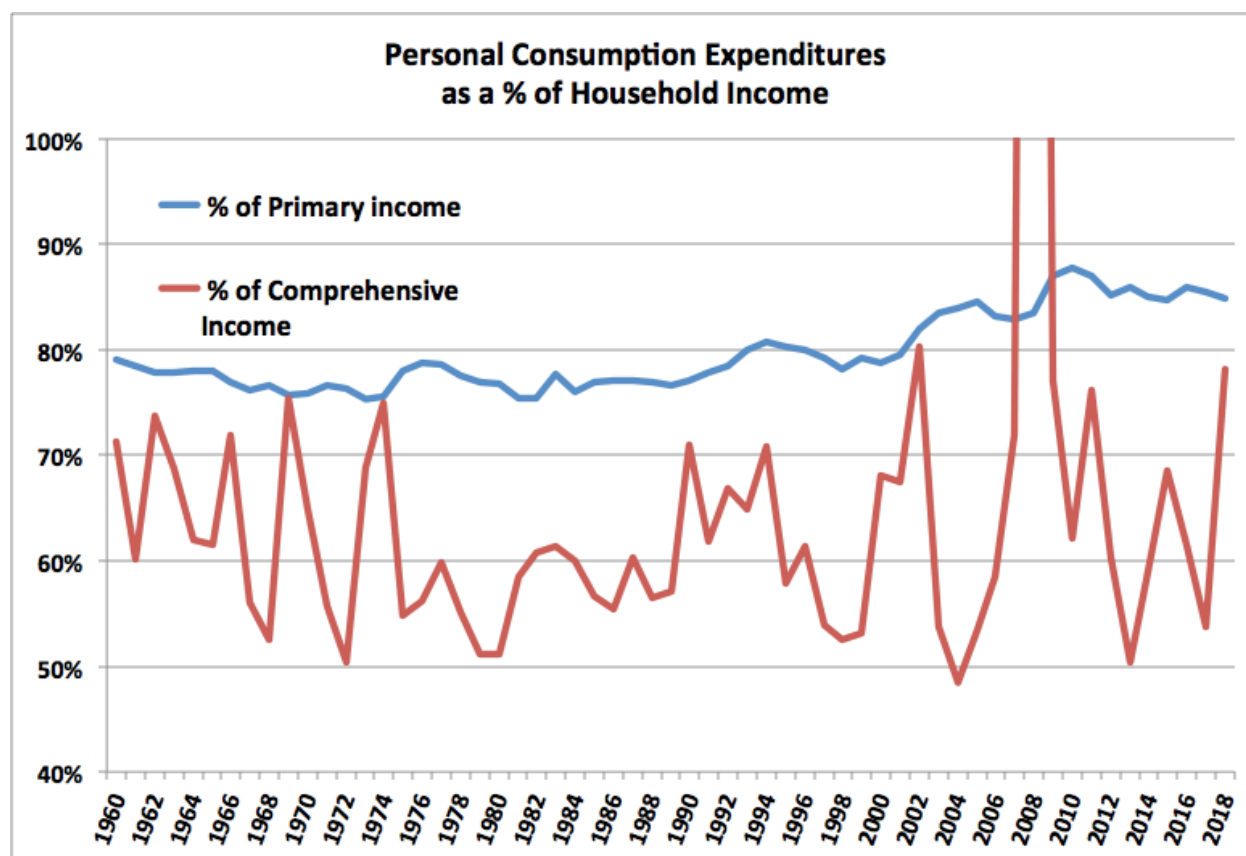


Figure 17.

Taxes as a percent of income also paint a very different picture (Figure 18).

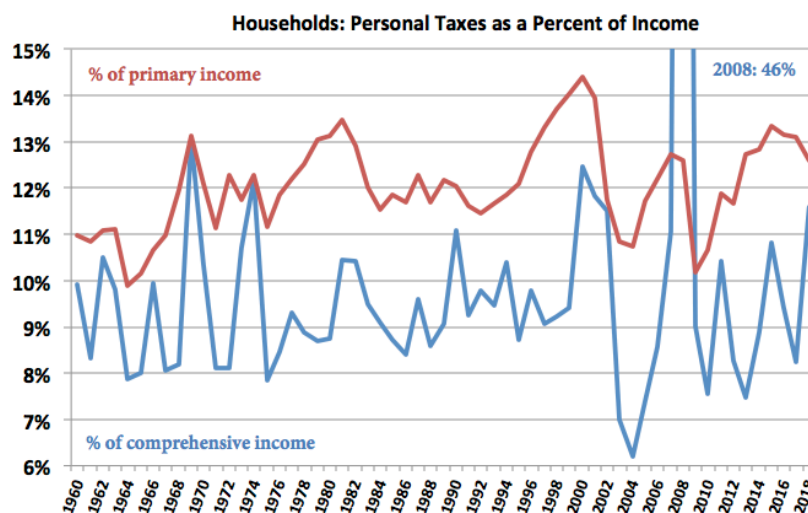


Figure 18. The tax measure in both series is the IMAs' "Taxes on income, wealth, etc." (federal, state, and local), sometimes labeled "personal taxes." It does not include property or sales taxes. See Appendix.

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.³⁶

Appendix: Accounting for Comprehensive Income

The spreadsheet shown in Figure 11, including all 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. Likewise, hence, comprehensive income.

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, sole proprietorships, and LLCs (which can opt for either partnership or S-corp tax treatment).

“Withdrawals from income of quasi-corporations” *are* pass-through profits from the noncorporate nonfinancial firms sector: partnerships³⁷ and sole proprietorships. (This pass-

³⁶ 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/PAERReview/issue95/Roth95.pdf

³⁷ This also includes limited liability *companies* (LLCs, which are technically not “corporations”) that have made the IRS election to be treated as partnerships (vs. S-corps). These non-“corporate” partnerships notably include most private equity funds, plus professional partnerships including doctors, lawyers...and accountants. (Hedge funds’

through transfer means the noncorporate nonfinancial firms sector in the IMAs shows zero saving/retained earnings; that's all imputed to their household owners.)

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 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.

Consumption of fixed capital. The comprehensive income measure here is “net,” after Consumption of Fixed Capital, or depreciation — necessarily so, because capital depreciation in a period *does* reduce end-of-period assets. The accounting mechanisms of that reduction are not depicted in this top-level view, however; they enter the accounting through the Operating Surplus measure, and primarily through total returns from firm ownership, which are themselves complexly affected by the firms’ capital depreciation.

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 (other) property income.

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

Transfers. This presentation treats transfers received net of transfer payments/contributions as income, rather than treating gross receipts as income, with payments included under uses. (The gross received and paid amounts are broken out.) This is appropriate because transfers by definition³⁸ are made with no (expectation of) reciprocal receipts in cash or kind, current or future. Most of these transfers are social, government transfers (95% of receipts and 87% of payments), notably for Social Security and Medicare. The current contributors and recipients are of course not the same people; in general, younger (workers) contribute and older people receive. To the extent the transfers and contributions are equal, that amount is best conceived as *individuals’* deferred earnings, received, and could arguably be categorized as labor income for the household sector, with the equal contributions treated as uses. That is not the treatment used here.

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.)

³⁸ unstats.un.org/unsd/nationalaccount/glossresults.asp?gID=576

The remaining net transfers cannot be clearly categorized as either “earned” labor income, or property income. Hence comprehensive income here has three top-level categories: earned labor, unearned (comprehensive) property, and net transfers. (Net capital transfers, by the way, are only about 0.1% of income.)

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.

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 inside operating surplus.

Rather than completely re-jiggering the IMAs’ treatments 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 quite different from homeowners’ owner-occupier-landlord-imputed “profits” as depicted (arguably more completely and accurately) in Rental Income of Persons in NIPA tables 7.9, 7.4.5, and 7.12.

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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