Spending by Bottom-80% U.S. Households Is Persistently Greater than Income. What Funds the Deficit?

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Abstract: This paper explores economic measures that are surprisingly hard to assemble: household income quintiles' annual spending relative to annual income. The total sector's income-minus-spending surplus is heavily dominated by the top 20%. The bottom 80% runs persistent spending deficits, implying ongoing asset disaccumulation; the bottom 80%'s annual "propensity" to spend relative to income, or spending multiplier, is greater than one. This spending deficit is found to be largely explained or "funded" by two additional asset sources that are not included in income: borrowing from the financial/banks sector, and — to a far greater extent — capital gains on asset holdings.

Sources for all economic measures employed here are cited. The source data is assembled along with source links, calculations, derivations, and figures, in a downloadable Excel spreadsheet at wealth-economics.com/propensity.xlsx.

The initial impetus for this paper was simple curiosity about a rather basic economic measure that's surprisingly hard to lay hands on: How much do different household income quintiles spend each year, relative to their income?[1] That exploration gave rise to some perplexing results that seemed to bear deeper investigation.

Measures of household income, spending, and "saving," and their derivatives — saving rates and spending multipliers — are central to Keynesian economic understandings, models, and analysis. But most work examines those measures in aggregate, for understandable reasons: In the U.S., at least, government income distributional tables that match the national accounts aggregate measures only became available in 2020, only in prototype form, and only covering

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[1]   Most analysis on this topic has focused on spending relative to "marginal" *changes* in income, versus annual spending out of or relative to total annual income. The "propensity to spend" (and save) literature is also somewhat inconsistent about the time element: propensity to spend over what period? This is not to suggest which measure is superior, rather just to highlight the more basic, baseline "propensity" measure explored here: annual spending relative to annual income.

twelve years, 2007–2018.[2] The tables provide breakouts of personal and disposable income, and subcomponents, by income deciles. (BEA: Distribution of Personal Income.)

A long-term aggregate view of these measures, for all households, is easily available (Figure 1).

*Figure 1. Personal spending relative to income, monthly.[3] BEA series: fred.stlouisfed.org/graph/?g=Hx4v*

A) Nominal dollars

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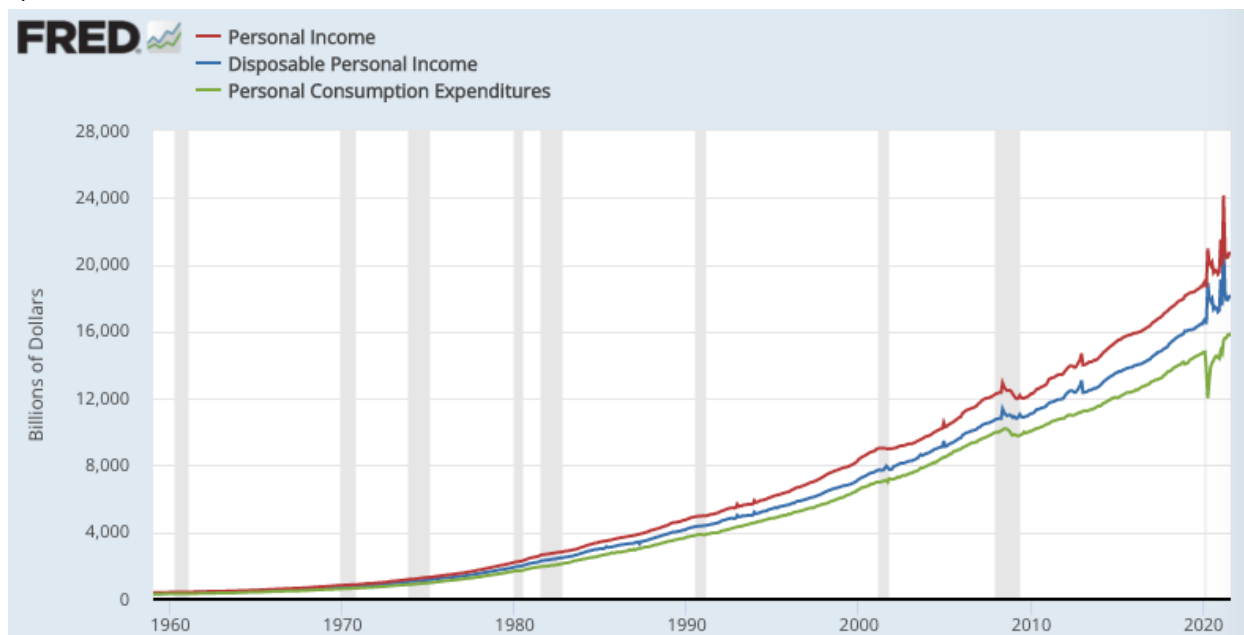
[2]   Fisher et al (2020 and preceding papers) assemble quintiles' incomes for 1999-2013 from the Panel Study of Income Dynamics (PSID), but 1. those income data series are not published, and 2. They don't match the aggregate macro national-accounts measures; eg: "One particular category missing from both income and consumption are government-provided and employer-provided health benefits." Piketty, Saez, and Zucman's (PSZ's) Distributional National Accounts (DINAs) provide matching income breakouts (mainly based on IRS microdata) by percentiles, and for a much longer period, but not by quintiles of income. This is pertinent here because the only comparable, published government tables of household spending distribution (the Consumer Expenditure Survey, CE or CEX) are by income quintile. It would be possible to generate quintile income breakouts from the microdata that PSZ provide, but it involves significant edits to a suite of Stata programs, which in turn generate data requiring further massaging into tractable spreadsheet form. This would be a valuable project for interested parties.

[3]   The BEA's Personal Income is 1. market income (earned labor compensation plus unearned property income) plus 2. *net* transfers mostly from government — transfers received minus contributions paid. Disposable Personal Income is Personal Income minus Personal Taxes paid (mostly income taxes; PT comprises ~90% of household taxes paid), so it's after both transfers and taxes. Personal Consumption Expenditures include purchases of household durables (mostly vehicles), and imputed "rent" that owner-occupiers "pay" to themselves as "landlords"; so it provides an estimate of household-sector rent spending for owners and renters combined. Homeowners' landlord "profit" is similarly included in Personal Income via calculations of "Operating Surplus." If anything, these imputations overstate owner-occupiers "cash" income, and understate their outflows (they have to make their full monthly mortgage payments), so understate their experienced month-to-month cash-asset deficits.

B) Household-sector spending-to-income ratios. Post-2019 is hidden to focus on more-typical years unaffected by large government stimulus transfers adding to household-sector income.
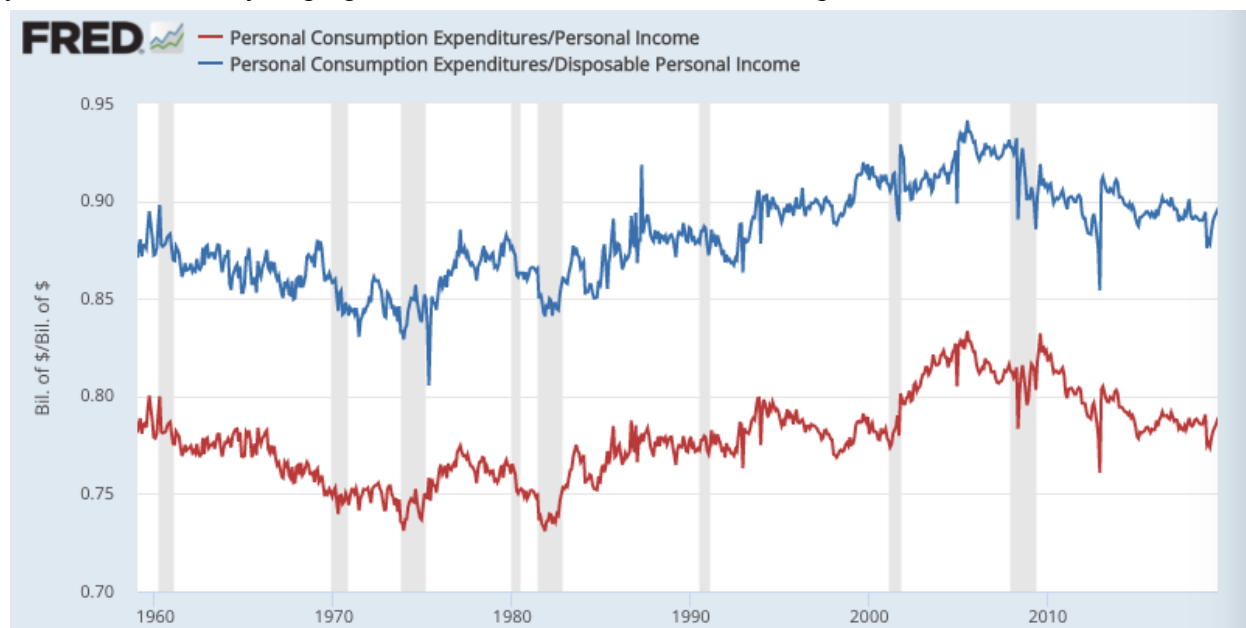
In this picture, 10% of disposable (after-transfer, after-tax) income is not "spent on" to firms for purchases and consumption, sent to government for taxes, or to lenders for interest payments. It's held (or "hoarded"), accumulated in the household sector as asset holdings.[4] (Assets paid *among* households for spending or transfers likewise stay within the household sector — though the asset holdings may/do move across quintiles.)
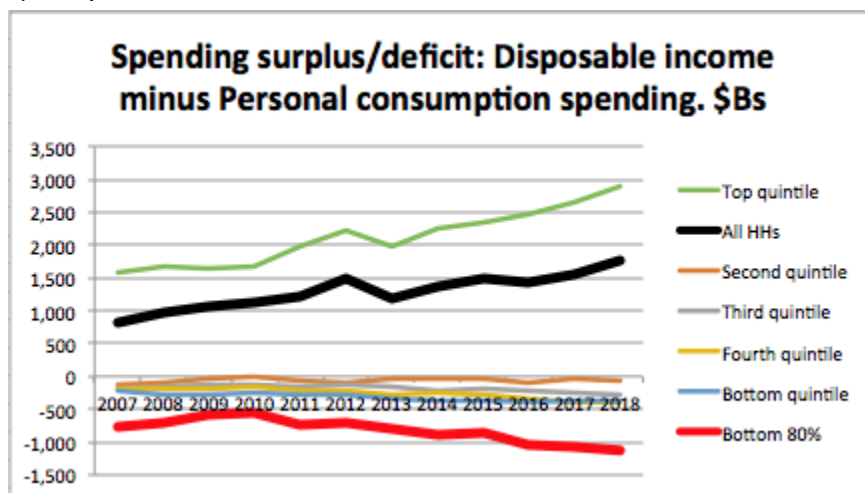
Quintiles' Spending Surpluses/Deficits

The Distribution of Personal Income tables combined with the Consumer Expenditure Survey (CE or CEX) run by BLS/Census since 1984, let us see an estimate of households' income and spending by income quintile over twelve years (Figure 2).

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[4]   The portfolio mix or "composition" of households' asset holdings — "cash" or bank "deposits" (M2) versus bonds, stocks, real estate, etc. — is a separate issue not addressed here. The same is true for constant "portfolio churn" — individual households swapping M2 assets for equity shares, for instance (and necessarily the reverse) — whereby households readjust their asset mixes, and "liquidate" non-cash assets when they want to spend from their asset holdings. These asset sales/purchases are dollar-for-dollar asset swaps, with no effect on a household's total assets.

Figure 2. Personal income and spending. Spending measures for each quintile are calculated as total Personal Consumption Expenditures (BEA) times each quintile's percent share of total consumption spending (CEX).

A) All quintiles
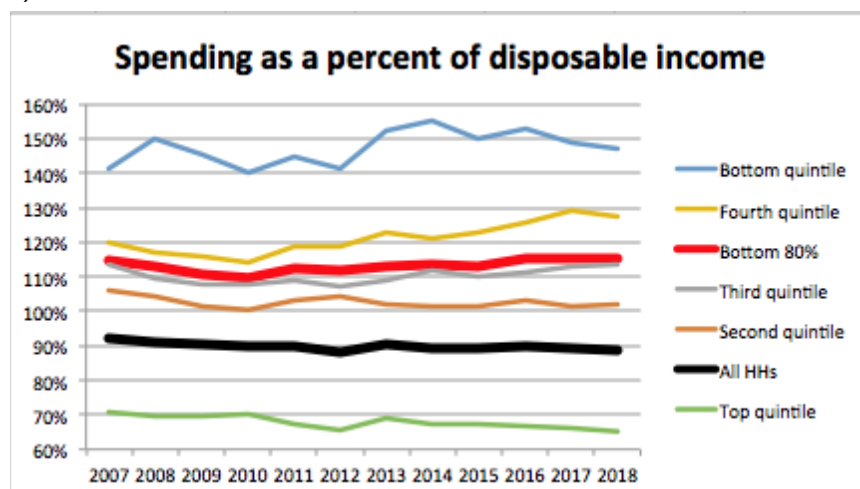

B) Excluding top quintile
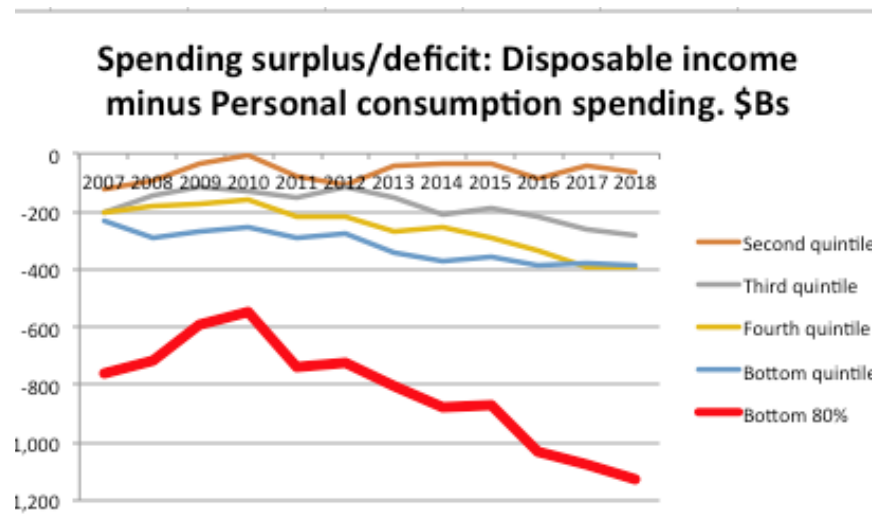
The surplus in the all-household aggregate is heavily dominated by large top-quintile income-to-spending surpluses. The bottom four quintiles all run significant spending deficits. Combined, those total to more than a trillion dollars a year 2016–2018. (For reference, 2018 Household Disposable Personal Income was $15.8T, $7.4T for the bottom 80%.)

This result problematizes the standard household "spending vs saving" construct. At least over these dozen years, the bottom 80% has consistently *dis*saved. This paper sidesteps that conceptual difficulty by only considering income and spending, and balance-sheet results: asset accumulation/disaccumulation. (See brief discussion of saving in Footnote 17.)
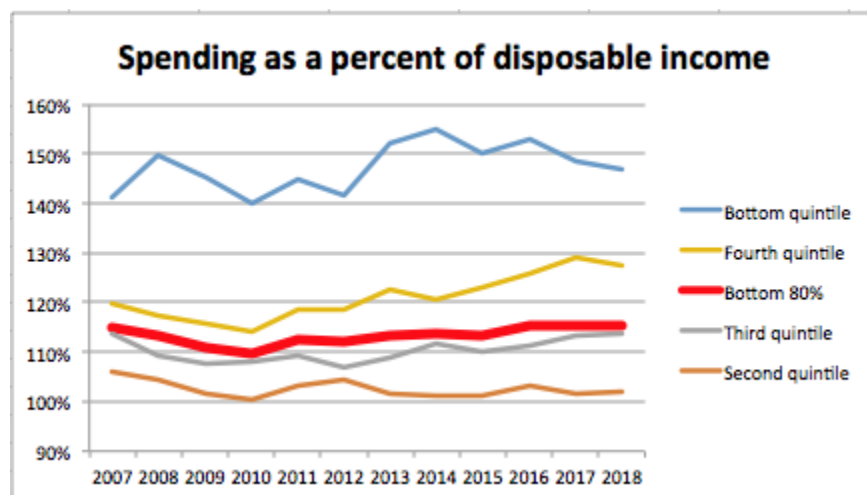
It's also useful to look at spending relative to income in more typical percentage "propensity" or "multiplier" form (Figure 3).

Figure 3. Household spending as a percent of disposable income

A) All households

B) Excluding top quintile

The ratios are all pretty consistent over the period. All households combined spend about 90% of income (matching the aggregate in Figure 1b). The multipliers for the bottom four quintiles range from just above 1x for the second quintile, to ~1.5x for the bottom quintile. The top quintile multiplier is .65x–.7x. In short form: the bottom quintile's propensity is more than double the top quintile's; the bottom 80's multiplier is ~1.75x greater than the top quintile.[5]

This basic dollar view of quintiles' annual spending and income raises a perplexing question: how can lower quintiles consistently spend more than their income, steadily spending down their assets? Assets are constantly received or "topped up" from income — but not sufficiently. They should eventually have no assets left to spend.[6] Which brings us to the title topic of this paper:

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[5]   Fisher et. al. (Table 1) find an annual propensity to consume of less than one in both 1999 and 2013 for all income *and wealth* quintiles. But (see footnote 2, here) their income and spending measures are quite different from the national accounts' DPI and PCE measures.

[6]   Note that net worth is not pertinent to the question here. A household, or a quintile, can have negative net worth but still have assets to spend. (By contrast, the net worth of a household with zero assets must be ≤ zero.)

what "funds" that deficit spending? Where do the assets come from that allow lower-quintile households to deficit-spend persistently?

There seem to be four potential other sources of household assets, unaccounted for in Personal Income:

1. Borrowing from the financial sector/commercial banks/government.
2. Holding ("capital") gains on assets, which aren't included in income measures.
3. Inheritances transferring assets down the quintiles, especially from the top 20%.
4. Changes in household composition.

This paper focuses one the first two of these asset sources. The last two are briefly discussed at the end of the paper.
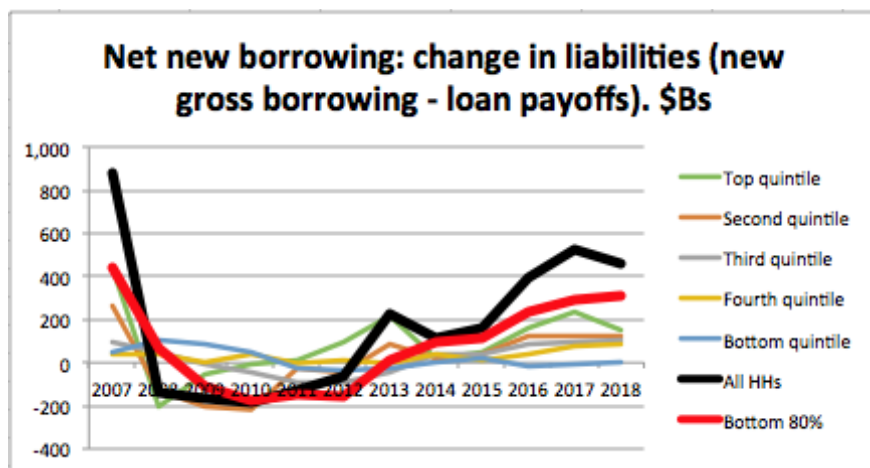
Household Borrowing

Many may quite reasonably jump to household borrowing as the most likely funding source for bottom-80 deficit spending. The best measure of that asset inflow is change in household debt, representing *net* new borrowing: gross new borrowing minus loan payoffs.[7] This measure by income quintile is conveniently available from the Fed's Distributional Financial Accounts (DFAs; Figure 4).[8]

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[7]   New borrowing increases both household assets and liabilities in equal amounts, for net-zero change to net worth. Households may of course spend down newly-borrowed assets by buying and consuming goods from firms. This would reduce both household assets and net worth. But that is precisely the spending-out-of-assets dynamic being explored here, already captured in spending measures. The borrowing and the spending are separate events, even though in practice they're often simultaneous and conjoined, for example in mortgage home purchases and credit-card spending. Note that credit-card purchases are generally borrowing plus consumption spending (the purchased goods are consumed, so vanish), while mortgage purchases of existing residences are borrowing plus an asset swap: cash for a land title.

[8]   In addition to the interactive online app for viewing this data, all details (and more) are also available in a downloadable zip file of CSV documents. The worksheet employed here is dfa-income-levels-detail.csv, which provides expanded detail of asset and liability categories. (Though those finer categories are not necessary for this immediate calculation, of change in total debt by income quintile.)

Figure 4. Households' annual net new borrowing

*A) All households*

B) Excluding top quintile
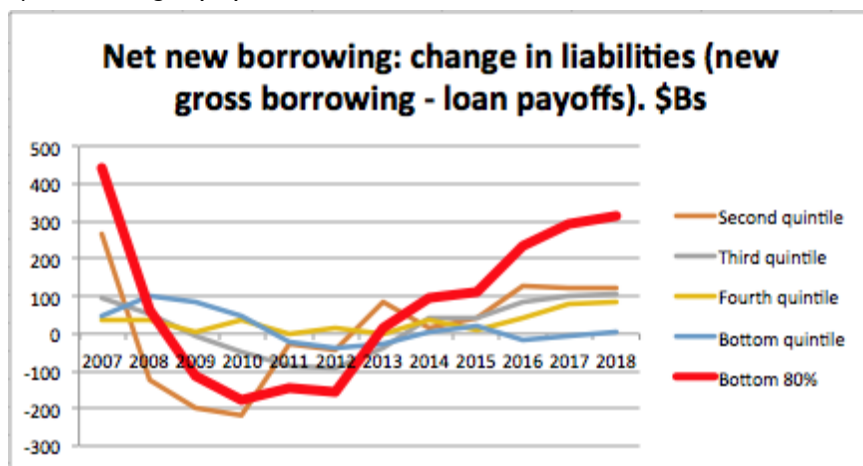
In the four years 2009-2012, bottom-80 net borrowing was actually negative, as households paid down debt and "repaired their balance sheets." Even in 2017-18, annual bottom-80 net borrowing was only about $300B — compared to more than $1T of annual bottom-80 deficit spending.
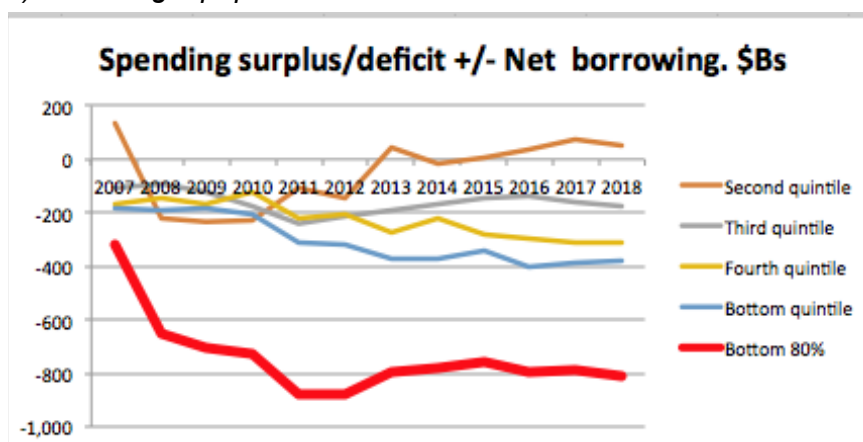
How does that borrowing impact the "asset deficit," disaccumulation, of the bottom 80% (Figure 5)?

Figure 5. Households' asset deficits after borrowing

A) All households

Spending surplus/deficit +/- Net borrowing. $Bs

B) Excluding top quintile

Spending surplus/deficit +/- Net borrowing. $Bs
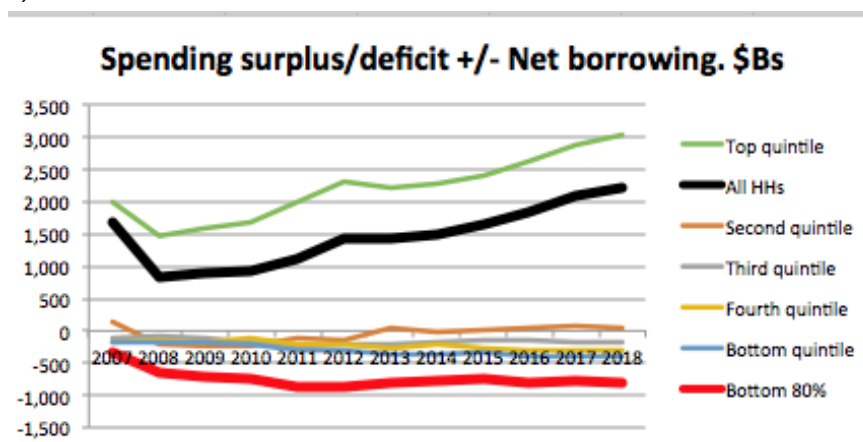
Borrowing did pull the second quintile "above the line" into asset accumulation in later years. But even after borrowing, the bottom 80's asset deficit remains large, and surprisingly steady: around $800B a year since 2010. New borrowing doesn't come close to explaining how the spending deficit is funded.

Capital gains

Households also accumulate assets via price runups in the asset markets (Figure 6). When equity-market or home prices increase, households have more assets. These gains ("valuation" as opposed to "volume" changes in national-accounts-speak) are not included in, are additional to, income measures. These increases are often imagined as just temporary, up-and-down fluctuations around some unnamed and unmeasured "true" "value," but in fact that accumulation is persistently positive, ongoing, and very large — actually comprising the overwhelmingly dominant mechanism of household asset accumulation.[9]

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[9]   The $76T sum of capital gains accumulated through 2019 represents 56% of households' $134T of accumulated assets, end of year 2019. Roth 2021 provides a detailed explanation of national accounts' treatment of household income, asset accumulation, and comprehensive "Haig-Simons" income including holding gains.

Figure 6. Household capital gains. Integrated Macroeconomic Accounts, Households table S.3.a, line 95. fred.stlouisfed.org/release/tables?rid=52&eid=810656
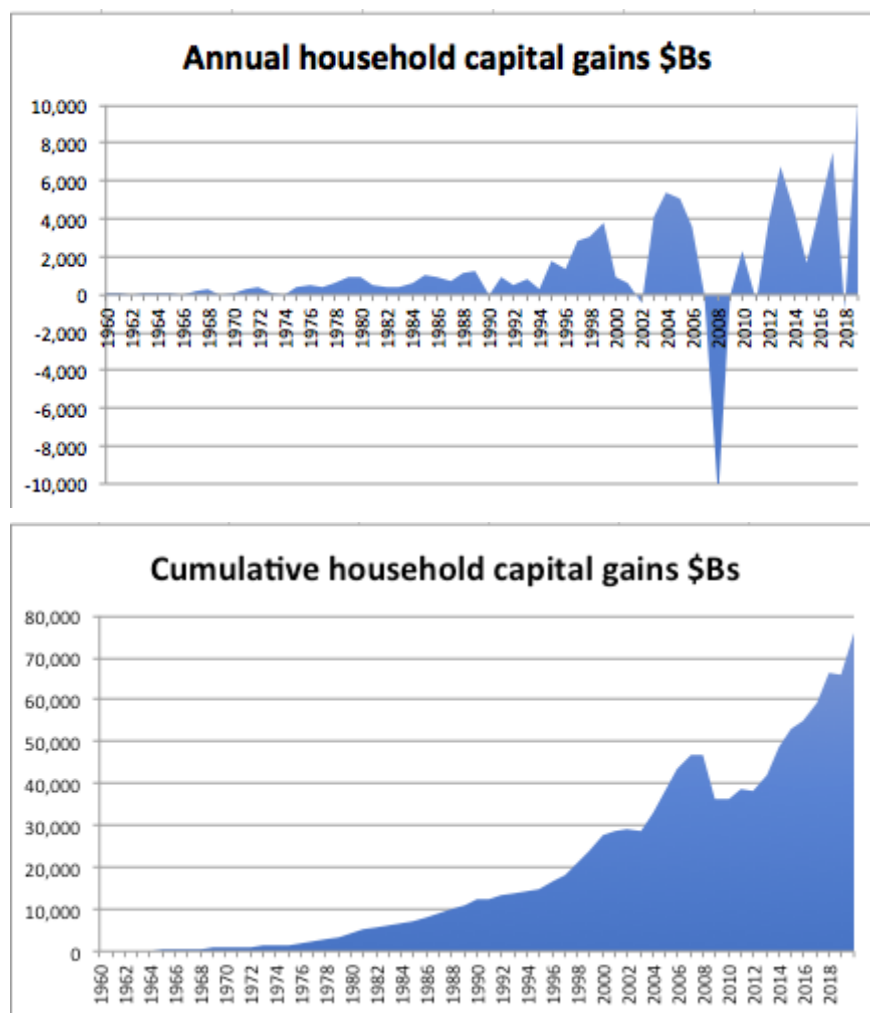
Over six decades there has been only one significant drawdown in this sum of steadily-accumulating assets, in 2008 (down 23%). To repeat: when asset-market prices go up, households have more assets. Individual households that want to spend out of their appreciated assets can swap them with other economic units for M2 assets[10] (sell or "liquidate" them) — a necessary mechanical step because sellers/firms demand M2 assets in payment for goods and services.[11] These individual asset swaps/"realizations" are significant to the IRS, but not to the analysis here. In aggregate they're best understood as "portfolio churn."

Since holding gains are based entirely on asset holdings, it's possible to allocate those gains to income quintiles, based on each quintiles' share of asset holdings from the Fed's Distributional Financial Accounts (Figure 7).

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[10] M2 consists of checking, saving, and money-market-fund holdings ("deposits"), plus physical cash (much of which is held in offshore suitcases of $100 bills). See table of monetary aggregates here.
[11] "Everyone can't sell all their appreciated assets at once!" is not a pertinent objection. Periodic asset-market drawdowns notwithstanding (depicted in Figure 6), that never happens — and at the limit, never could happen absent global (financial) armageddon.

Figure 7. Household capital gains. Each quintile's gains are calculated as total holding gains on assets (IMAs) times each quintile's holding share of assets (DFAs).[12]

A) All households
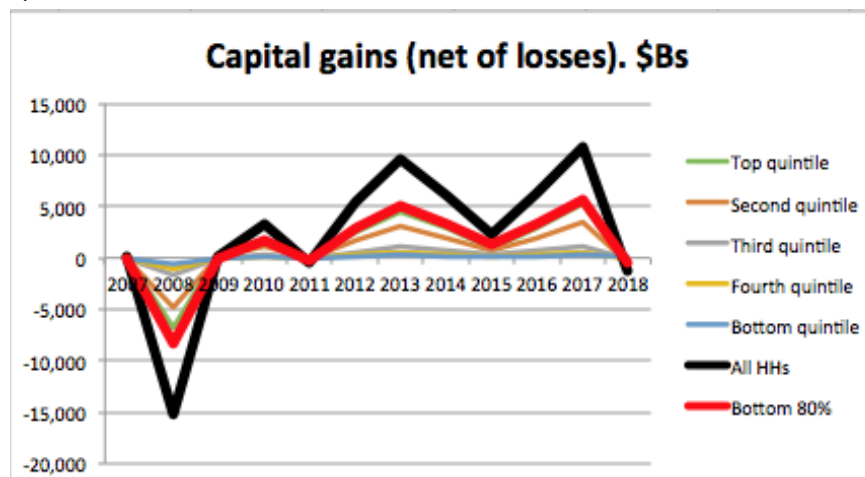
B) Excluding top quintile

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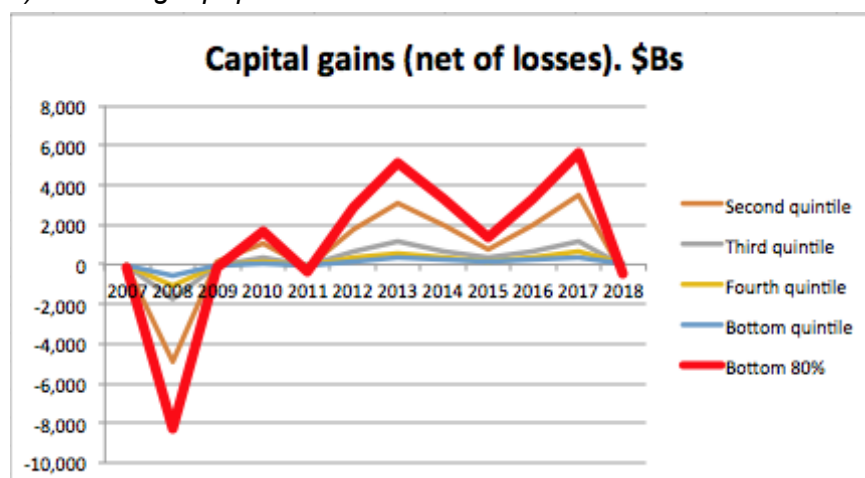
[12]   Different quintiles, however, hold different proportions of different asset *types*. Broadly: lower quintiles hold real estate titles, while the top quintile holds most stocks and bonds. And different asset types may deliver holding gains at different rates. The measures here break out quintiles' holdings of financial versus nonfinancial assets, calculate gains on FAs and NFAs separately for each quintile, and sum the two. This captures the big, key difference between upper and lower quintiles. A more difficult but smaller issue arises within financial assets, between the two largest asset classes therein: equity (and bond) holdings vis-a-vis pension entitlements. This is compounded because the DFAs and the IMAs use different categories for those assets. No attempt is made here to resolve that difficulty.
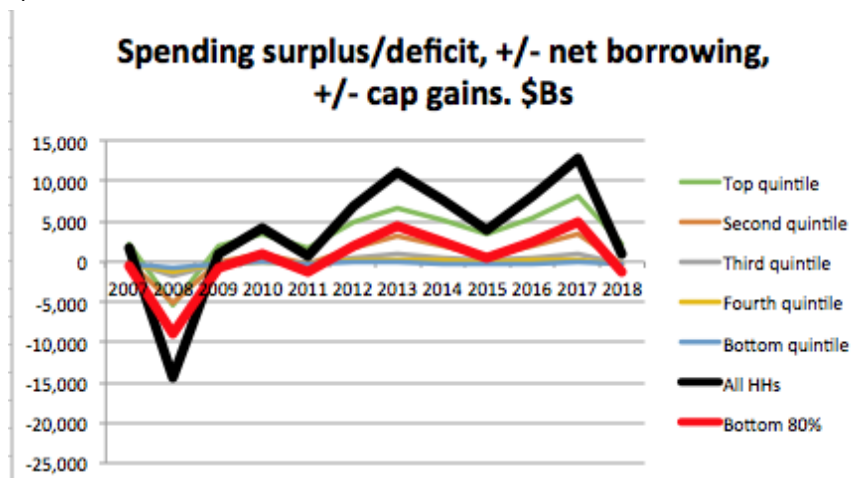
C) Excluding top two quintiles
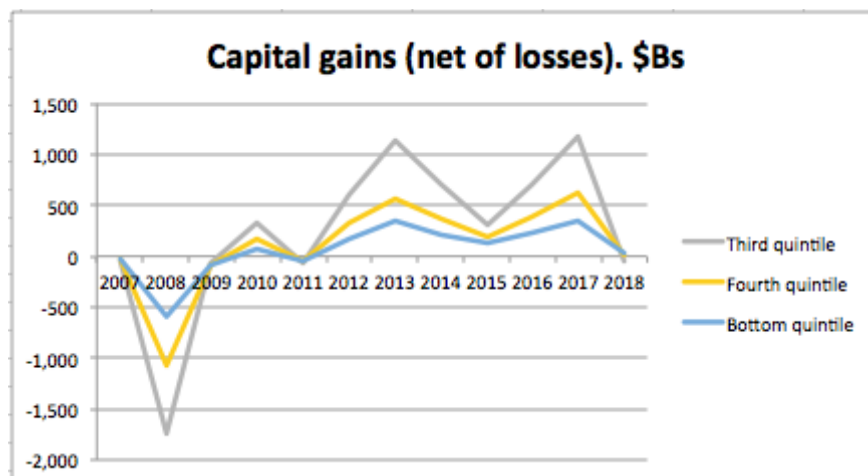
Note that these capital-gain measures are often an order of magnitude larger than the borrowing measures displayed above. (In recent years for the bottom 80%, $3-4T a year for capital gains vs. ~$300B at most for borrowing.)
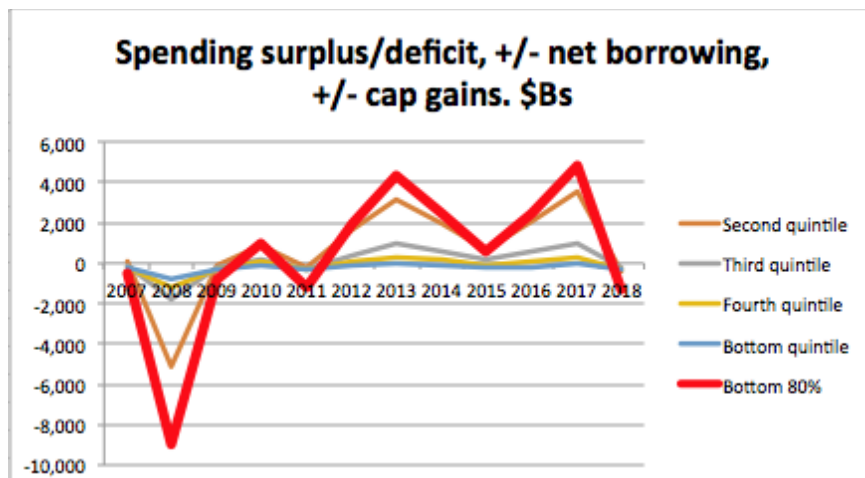
Asset Surpluses/Deficits

Combined with the borrowing measures, capital gains do serve to explain and "fund" most of the lower quintiles' spending deficits, shifting the bottom 80% to a large asset surplus (Figure 8).

Figure 8. Households' asset surplus/deficit after borrowing and capital gains

A) All households

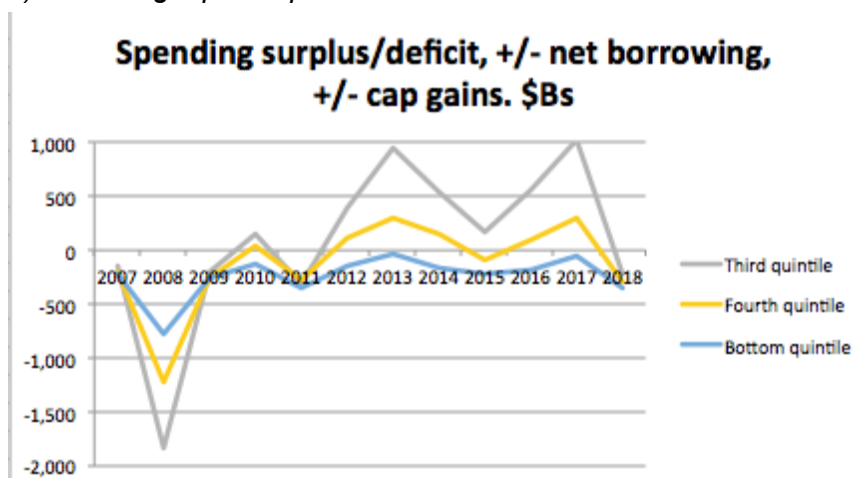*B) Excluding top quintile*

C) Excluding top two quintiles

After accounting for borrowing and capital gains, only the bottom quintile remains in persistent asset deficit after 2011 (the fourth quintile shows intermittent deficits). These unexplained, un-"funded" bottom-20 deficits are small in total-economy terms, but they're quite large relative to the bottom quintile's income (Figure 9).

Figure 9. Bottom-quintile asset deficits

Figure 10. Calculated household asset surpluses/deficits vs measured asset changes
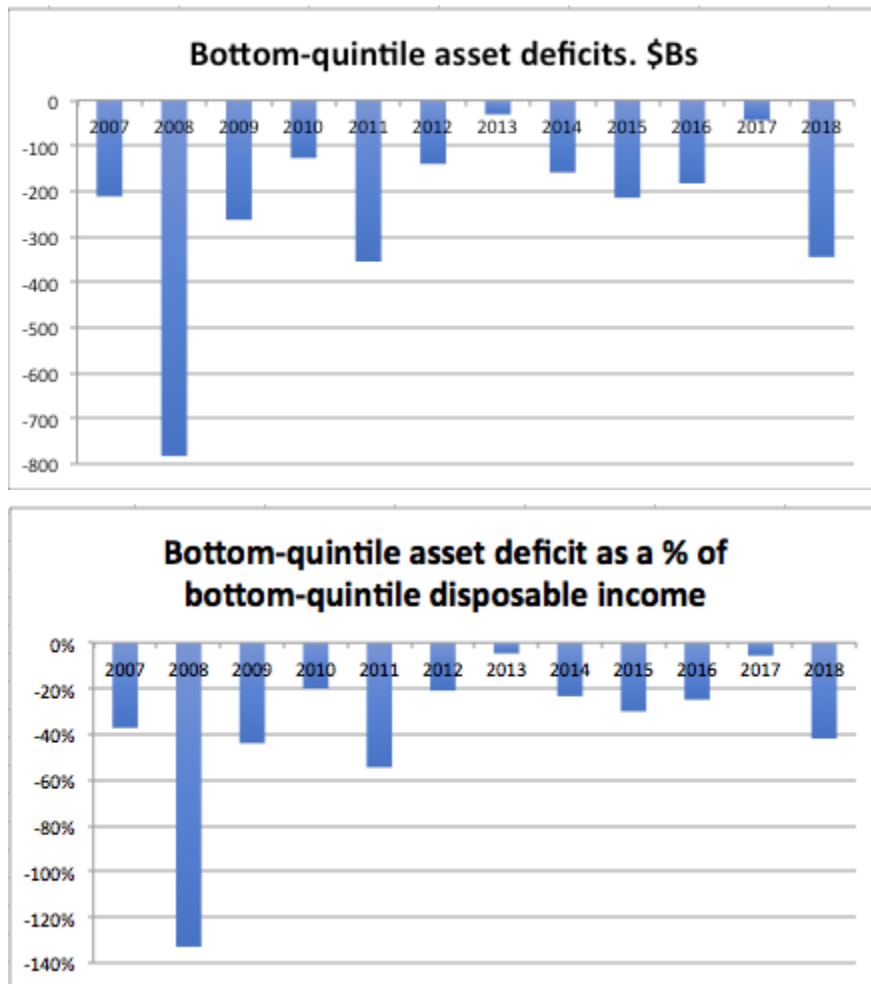
A caveat is in order here. The multiple economic measures employed here (in various combinations) to calculate quintiles' asset surpluses/deficits are based on very different data-gathering and analytic methods. And the results show some important discrepancies (Figure 10).
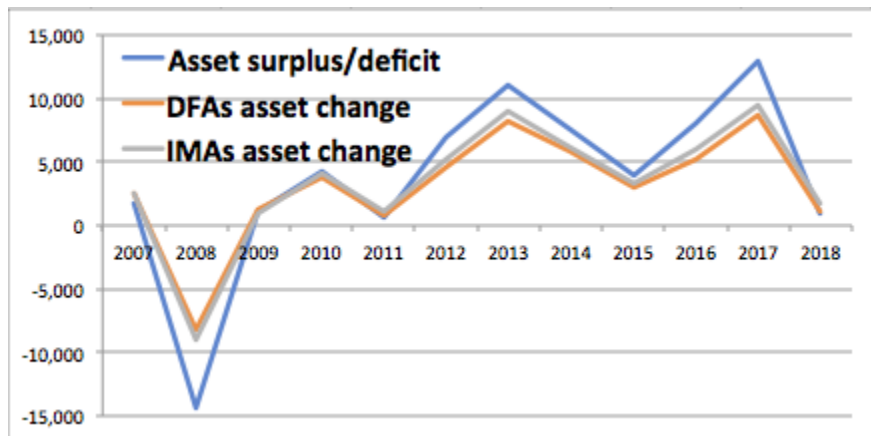
The calculated asset surpluses/deficits for all households *should* equal total observed asset changes for the household sector. They get close, are qualitatively quite similar and often close to identical, but there are significant quantitative discrepancies that bear examination, suggesting the value of improvements in measures and methods if possible.[13]

Returning to the remaining, unexplained bottom-quintile asset deficit: the methods and macro-level data sources employed are probably too crude to usefully explain this. Two possible remaining asset sources (which are interrelated) both pose difficulties, and may overwhelm the (small but significant) remainder deficit itself. The available data on asset transfers from inheritance and gifts is very limited.[14] And quintiles' compositions — households (and their assets) entering, leaving, and moving between quintiles as their income and life circumstance change (and as they pass away) — are subject to difficult methodological comparison issues across the income, spending, and asset-holdings macro data sources. Spending and transfers within/among bottom-quintile households may also help explain how individual households manage the zero-asset problem.

Borrowing vs Capital Gains

An important overall question remains: Which of the two asset sources examined here does most to explain and fund the bottom 80's spending deficit? From 2013–17, years when the bottom 80% showed both positive borrowing and positive capital gains, borrowing funded between 2% and 27% of the spending deficit. Capital gains, by contrast, were multiples larger than those spending deficits — ranging from 2X to 6X (Table 1).

Table 1. Funding bottom-80% spending deficit

Bottom-80% non-"income" asset sources as a proportion of spending deficits

	2013	2014	2015	2016	2017
Borrowing	2%	11%	13%	23%	27%
Capital Gains	6X	4X	2X	3X	5X

The magnitude of these differences dwarfs the data discrepancies highlighted above. Capital gains are the overwhelmingly dominant asset source transforming the bottom 80% from deficit spending to multi-trillion-dollar asset accumulation.[15] The bottom-80% spending deficit is

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[13]   One key estimation method stands out for this year-by-year discrepancy test: the IMA and DFA asset measures are heavily based on the triennial Survey of Consumer Finance (SCF); intermediate years (and quarters) in their measures rely on interpolation.

[14]   Estimating using CDC % annual deaths by age group and DFAs' total net worth by age group, 2018 bequests were approximately $1.7T (about $13,000 per U.S. household, $5,000 per person). The absence of inheritance data is largely because estate taxes in the United States have excluded most estates from taxation or even reporting, and estate-tax returns are the primary or only sources of "administrative data" on bequests hence their distribution. For 2020, only estates exceeding $11.6M, $23M for surviving spouses, are required to file an estate tax return — a small fraction of annual decedents/bequestors and heirs, and a somewhat larger fraction of total inherited assets.

[15]   Net worth (for what it's worth) is differentially affected here. Borrowing increases households' assets and liabilities in equal amounts, with no change in net worth. Capital gains, by contrast, add no

inexplicable without the capital gains measure, which is absent in almost all economic modeling and analysis (Roth 2021).[16]

Lifecycle Assets

Lurking silently so far in this analysis is the issue of age. Younger households tend to accumulate assets, while older ones, especially retired households, spend them down more. It's a necessary consideration in unpacking the dynamics addressed here. This is well-illustrated in a recent, novel, and revealing "heat map" of household saving (Figure 11. Mian 2021).

Figure 11. Saving behavior by age and income level.
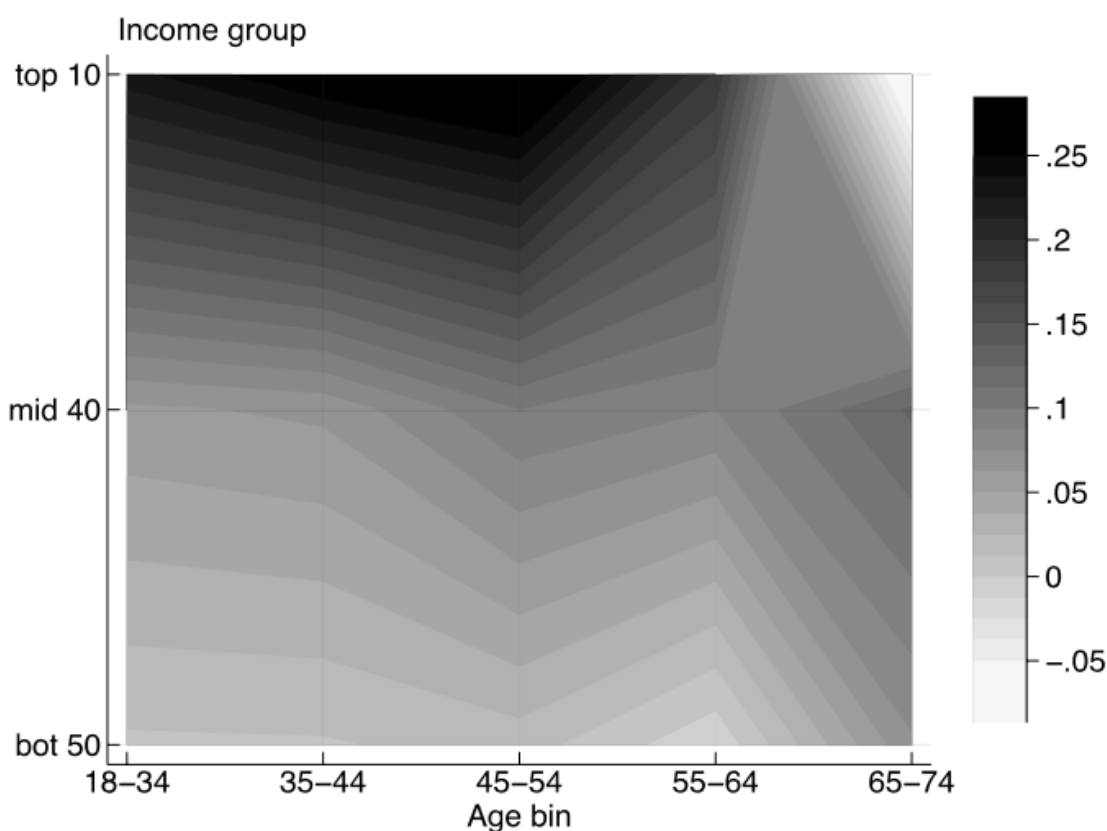
Note: Saving rate heat map across the within-birth-cohort income distribution and the age of household head distribution. The sample period is 1953 to 2019.

This displays quite different lifetime (dis)saving patterns for the top-10 versus bottom-50 groups. Over-55 households in particular (which hold 66% of household assets per the DFAs) show

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new liabilities to households' (or any sector's) balance sheets, so those big asset additions also increase households' net worth.

[16]   Unusually and admirably, Fisher et. al. acknowledge this explicitly: "Our measures of income and consumption do not completely characterize the Haig-Simons income measure." (H-S income includes accrued capital gains.) In a footnote they cite a previous paper by two of the authors (Smeeding et. al.) that discusses Haig-Simons, and add, "As no household survey has the necessary variables to create a full measure of Haig-Simons income, few studies use these definitions." The inclusion of capital gains in this current paper (allocated by income quintile) effectively employs that measure, often characterized as a measure of "sustainable" spending. See Roth 2021 for a construction and derivation of "comprehensive" U.S. Haig-Simons income, 1960-2018.

notable discontinuities between income classes. Given the conceptual difficulties associated with "saving" measures, asset surpluses/deficits as employed here may be more revealing measures for examining this age-and-quintile spending and (dis)accumulation behavior.[17] Extending PSZ's 10/40/50 percentile breakouts (used in that graph) to quintiles, as suggested here in Footnote 2, could provide a somewhat more granular picture of that dynamic.

Conclusions

Despite the caveats mentioned above, there are some macro-level takeaways from this exercise. Examining raw dollar measures of households' and quintiles' annual income and spending yields important insights.

- The bottom 80% of households consistently spends significantly more than it receives in income.

- Household borrowing explains how some of this spending deficit is funded, but not nearly all.

- Capital gains combined with borrowing do explain and "fund" the remaining spending deficit (and much more) of the top 60% or 80%. But a persistent asset deficit remains for the bottom 20%.

- The bottom-80% spending deficit is overwhelmingly funded (and moved into asset surplus) by holding gains, versus borrowing.

- The remaining bottom-20% asset deficit requires more detailed exploration and investigation, particularly regarding inheritance/gift dynamics, and the methodologies of source data sets.

- The age composition of income quintiles, and lifetime patterns of asset surpluses/deficits, seem necessary to a useful understanding of quintiles' spending dynamics.

- The empirical dominance of capital gains in the income/spending dynamics explored here tends to suggest that it's impossible to understand how economies work if those gains are absent from economic models.

Returning to the issue that originally spurred this exploration: it seems clear that standard components of propensity-to-spend measurements — income (absent holding gains), spending, and "saving" relative to income — are incomplete and insufficient to explain or understand either household spending, or larger economic dynamics.

In particular, the very large multiplier differences in quintiles' annual propensities to spend out of income, which show significant empirical regularity, suggest that marginal propensity measures, as constructed, may greatly understate the potential effects of income concentration and (re)distribution on aggregate spending, GDP, economic growth, and associated macroeconomic

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[17]   *Pace* Mian et al, a household's saving (*not*-spending or "holding" relative to/out of income) does not create assets, or increase the aggregate stock of private-sector assets — so-called savings or loanable funds "entering the financial system" (p. 2). Saved assets remain in the holder's account, while spent assets just move to another, both within the financial system. An individual household's saving/holding increases its stock of accumulated assets, but not the collective private-sector stock.

measures and changes. This line of research holds promise especially as the national accounts' measures of distributional household income move beyond prototype stage, and encompass longer periods.

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