World Inequality Lab – Working Paper N° 2022/17

Top Wealth in America: A Reexamination

Emmanuel Saez
Gabriel Zucman

August 2022

WID.WORLD
THE SOURCE FOR
GLOBAL INEQUALITY DATA

NBER WORKING PAPER SERIES

TOP WEALTH IN AMERICA: A REEXAMINATION

Emmanuel Saez
Gabriel Zucman

Working Paper 30396
http://www.nber.org/papers/w30396

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
August 2022

We thank Owen Zidar and Eric Zwick for helpful discussions. We acknowledge financial support from the Center for Equitable Growth at UC Berkeley, the Carnegie Foundation, NSF grant SES-1559014, the Stone Foundation, and the European Research Council. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

Top Wealth in America: A Reexamination
Emmanuel Saez and Gabriel Zucman
NBER Working Paper No. 30396
August 2022
JEL No. D31,H25

ABSTRACT

Recent estimates of US top wealth shares obtained by capitalizing income tax returns (Saez and Zucman, 2020; Smith, Zidar and Zwick, 2022) are close in both levels and trends except for the top 0.01% where a large discrepancy remains. We examine this difference and, using public data, quantify three main issues in Smith et al. (2022). First, Securities and Exchange Commission data at the shareholder firm level show that billionaires' equity wealth is underestimated by a factor of 2.1. Second, interest-bearing assets at the top are under-estimated by a factor of 1.6, because of an extrapolation from a small and unrepresentative sample of investment funds. We quantify this issue using mandatory filings of US hedge funds. Third, issues involving tiered partnerships and the measurement of business profits suggest that large S-corporations are undervalued by a factor of 1.2 and top-owned partnerships by up to 2.2. After incorporating these results, the top 0.01% wealth share of Smith et al. (2022) is close to the one found in Saez and Zucman (2020) and estimates of US wealth inequality are reconciled.

Emmanuel Saez
Department of Economics
University of California, Berkeley
530 Evans Hall #3880
Berkeley, CA 94720
and NBER
saez@econ.berkeley.edu

Gabriel Zucman
Department of Economics
University of California, Berkeley
530 Evans Hall, #3880
Berkeley, CA 94720
and NBER
zucman@berkeley.edu

1 Introduction

What is the wealth of the rich and by how much has wealth inequality increased in the US? In an important contribution, Smith, Zidar and Zwick (2022) provide new estimates using confidential administrative tax data and building on the capitalization method developed by Saez and Zucman (2016) and updated in Saez and Zucman (2020). They obtain a level and rise in top wealth shares similar to Saez and Zucman (2020), despite different assumptions about rate of returns heterogeneity: "Accounting for this heterogeneity does not change the fundamental story for top wealth shares and their growth—wealth inequality is high and has risen substantially over recent decades" (Smith et al. 2022, abstract). For all top groups below the top 0.01%, estimates are indeed close in levels and trends, a notable convergence given the methodological differences involved.

There remains, however, a large discrepancy for the top 0.01%. While the share of US wealth owned by this group is around 2.5% in both studies in the 1970s, it differs in 2016: 9.3% in Saez and Zucman (2020) vs. 7.1% in Smith et al. (2022). Naturally, this gap leads to discrepancies in all top shares inclusive of the top 0.01%.

To understand the source of this difference, we examine the Smith et al. (2022) methodology. Three main issues are uncovered, which we quantify using public data. First, using mandatory disclosures to the Security and Exchange Commission, we show that Smith et al. (2022) dramatically under-estimate billionaires' equity wealth. For example, their methodology values Mark Zuckerberg's stake in Facebook at $1.3 billion in 2016 (vs. $53 billion in actual facts), Jeff Bezos's stake in Amazon at $5.7 billion (vs. $61 billion), and Warren Buffett's stake in Berkshire Hathaway at $0 (vs. $72 billion). This explains the difference with the Saez and Zucman (2020) estimates for the top 0.001%. Second, interest-bearing assets at the top are under-estimated because of an extrapolation from a small and unrepresentative sample of investment funds. Using compulsory filings of US hedge funds with the Securities and Exchange Commission, we show that hedge funds have fixed-income assets an order of magnitude larger than the funds used by Smith et al. (2022) for their extrapolation, and a third the interest rate they assume. Last, we provide evidence that Smith et al. (2022) underestimate the value of large passthrough businesses, especially partnerships, because of issues involving tiered ownership structures and the measurement of business profits. Addressing the investment funds and passthrough business issues closes the gap with Saez and Zucman (2020) for the top 0.01%-to-top-0.001% and allows for a complete reconciliation of the two studies.

2 Billionaires' Equity Wealth

Smith et al. (2022) estimate the equity wealth of billionaires by capitalizing dividends and realized capital gains reported in individual income tax returns. A heavy weight is put on

dividends: 90% as opposed to 10% for capital gains. Concretely, in 2016—the last year in their study—equity wealth is estimated by multiplying dividends by 33 and realized capital gains by 3.7. An individual with 0 dividend income and $1 billion in realized capital gains, for example, is assigned $3.7 billion in equity wealth. This approach fails to capture billionaires' wealth accurately, because many top billionaires are large shareholders of companies with zero or low dividend yields, and the low weight put on capital gains means they are assigned too little wealth even when they realize large gains.

For individuals owning large stakes in public companies, this issue can be quantified exactly using public data. All individuals owning more than 5% of a company's stock must disclose their holdings and transactions to the Securities and Exchange Commission (SEC). Using these public filings we compute the true equity stakes of large shareholders of public firms, and their annual dividends and realized gains. Table 1 lists the 5 largest individual stakes in public firms according to the SEC in 2016. The value of these 5 stakes adds up to about $260 billion (0.3% of total US wealth) in 2016. The Smith et al. (2022) methodology values these stakes at $37 billion only.

Table 1: Equity Stakes of the 5 Largest Individual Shareholders of Public Companies in 2016

Shareholder	Corporation	Equity stake ($B)		Dividends ($B)	Realized gains ($B)
		True value	Smith, Zidar & Zwick		
W. Buffett	Berkshire Hathaway	72.1	0.0	0.0	0.0
J. Bezos	Amazon	60.7	5.3	0.0	1.4
M. Zuckerberg	Facebook	53.4	1.2	0.0	0.3
L. Ellison	Oracle	44.8	23.4	0.7	0.0
L. Page	Alphabet	31.8	7.2	0.0	1.9
Top 5		**262.7**	**37.0**	**0.7**	**3.7**

Source: Equity stakes and realized gains are computed using SEC form 4 and form 13D disclosures, retrieved from the SEC Edgar database. Dividends are from 10-K forms.

Appendix Table A.1 generalizes this analysis to all equity stakes of the top 400 richest Americans that can be observed in SEC data (e.g., representing more than 5% of the stock of listed companies). We find that the Smith et al. (2022) methodology under-estimates the value of these stakes in 88% of the cases and by a factor of 2.1 in dollar terms (net of any over-estimation). These holdings are valued by Smith et al. (2022) at about $400 billion in total, instead of the true number of $865 billion. The difference represents 0.6% of total US wealth in 2016. This is nearly a third of the gap between Smith et al.'s (2022) and Saez and Zucman's (2016, 2020) top 0.01% wealth share.

The equity wealth of large shareholders in listed firms is obviously best inferred from direct data on holdings than indirectly derived from dividends and capital gains. The Smith et al.

(2022) approach that ignores these direct data is a step back relative to the literature. Since the early 1980s, *Forbes* has used the SEC data as input to its annual list of the 400 wealthiest Americans. Our current series (Saez and Zucman, 2020) and the official Federal Reserve Distributional Financial Accounts (Batty et al., 2019) all benchmark the wealth of the top 400 using the *Forbes* 400 totals, thus incorporating the true stakes reported to the SEC. In an earlier draft (Smith, Zidar and Zwick, 2021), Smith et al. also benchmarked their top-end estimates to the *Forbes* 400 (albeit imperfectly). But they do not anymore in their final series, and as a result undershoot the total wealth of the *Forbes* 400 by one third in 2016.

To estimate stakes in private C-corporations, Smith et al. (2022) also capitalize dividends and realized capital gains. The same problem arises: whenever these corporations distribute a small fraction of their profits as dividends, the wealth of their shareholders is under-estimated. Table 2 quantifies this issue for the 3 largest private corporations by revenue in 2016 according to the *Forbes* list of America's private companies. This quantification is possible because even though private firms do not generally have to publish their accounts, they do so when issuing bonds to the public or prior to being listed as public companies. Using these and other public sources, we find that the 3 largest private firms (all C-corporations according to public evidence) distributed little dividends in 2016. The equity value implied by the Smith et al. (2022) methodology is an order of magnitude smaller than the value estimated by the Federal Reserve to construct the US Financial Accounts.[1]

Table 2: Equity Value of the 3 Largest Closely-Held C-Corporations in 2016

Corporation	Equity value ($B)		Dividends ($B)	Revenue ($B)	Employees (thousands)
	US Federal Reserve	Smith, Zidar & Zwick			
Koch Industries	130	17	0.5	100.0	120.0
Cargill	99	14	0.4	109.7	155.0
Dell	61	0	0.0	50.9	101.8
Top 3	**289**	**31**	**0.9**	**260.6**	**376.8**

Source: All numbers are fully derived from publicly available information. US Federal Reserve valuation: apply 2016 price-to-revenue ratios by industry from A. Damodaran. See Appendix Table A.2. for complete sources and details.

Here again Smith et al.'s (2022) approach is a step back. The *Forbes* 400 estimates incorporate the value of stakes in large private C-corporations based on public information (e.g., annual reports disclosing revenues and employee counts; profit disclosed in the context of bond issuance or by rating agencies with access to private accounts; court records revealing ownership

[1]The Federal Reserve estimates private C-corporation equity using public data on the revenues of large closely-held firms (collected by *Forbes*) and applying the price-to-revenue ratio of public companies in the same industry and with similar revenues and employee counts (Ogden, Thomas, and Warusawitharana, 2016).

stakes, etc.). Although imperfect, these estimates are more accurate than those implied by capitalizing reported individual income, because in large closely-held C-corporations shareholders have incentives to limit dividend distributions (to avoid the income tax), can easily do so, and capital gains realizations are rare. This issue is quantitatively large: at least 13 of the 20 largest private firms by revenue were C-corporations in 2016, many of which with zero or low dividend yields (see Appendix Table A.2). The main closely-held private tech companies—including Airbnb, Palantir, Snapchat, and Uber—were too. About 70% of the private non-financial business wealth of the 50 Americans at the top of the *Forbes* 400 was in C-corporations with low dividend yields. Because incentives to operate as C-corporations have dramatically increased after the 2018 tax reform that cut the corporate tax rate to 21%, this issue is likely to get worse. If not amended, the Smith et al. (2022) methodology will increasingly underestimate large business wealth at the top.

Adding back the missing listed equity wealth from Table A.1 and the missing individual equity in the 3 private firms listed in Table 2—a conservative correction—adds about $700 billion (0.9% of total US wealth) to the top 0.01% wealth share of Smith et al. (2022) in 2016. The ideal way to implement this correction would be to replace the equity wealth estimated by Smith et al. (2022) for large shareholders of C-corporations by the true values, record by record. A coarser way to proceed is to upgrade Smith et al.'s top-end wealth so that it matches the *Forbes* 400 total.[2] As they show in their robustness analysis (Table 3.A line 11), doing so adds 0.9 percentage points to their top 0.001% wealth share in 2016. This closes all the gap between their top 0.001% wealth share and ours, and nearly half of the gap for the top 0.01%.

3 Interest-Bearing Assets in Private Funds

To estimate interest-bearing assets, Smith et al. (2022) capitalize interest income. All groups of the wealth distribution up to the top 0.01% are assumed to have an interest rate of 0.8%–1.5% in 2016, while the top 0.01% is assumed to have a rate close to 4%. This comes from imputing a high rate (about 6% in 2016) to interest earned via pass-through businesses—primarily interest earned in private funds, which are organized as partnerships and whose ownership is concentrated among the rich. This pass-through interest rate is too high, however, because it is based on an extrapolation from a small (asset-weighted) and unrepresentative sample of private funds.

Interest rates of private funds cannot generally be observed in US tax data, because tax balance sheets do not isolate interest-bearing assets from other assets. One can only compute

[2]If anything, matching the *Forbes* 400 may still under-estimate the equity wealth of the top 0.01%. About half of the $289 billion in closely-held equity wealth reported in Table 2 belongs to members of the *Forbes* 400. The rest belongs either to institutional investors (e.g., Dell was partly owned by a private equity fund in 2016) or to individuals likely to be in the top 0.01% but not in the *Forbes* 400 (e.g., Cargill is owned by about 100 members of the Cargill and McMillan families, only 10 of whom are in the *Forbes* 400 in 2016). The wealth of these individuals is too low in both Saez and Zucman (2020) and Smith et al. (2022).

an interest rate for funds that only earn interest, and thus only own interest-bearing assets. Smith et al. (2022) compute the interest rate of these funds and find it to be high (around 6% on average in 2016). They capitalize all pass-through interest assuming this sample of "interest-only" funds is representative. But this sample accounts for only a very small fraction of all pass-through interest: it distributed $6 billion in interest in 2016, which is 3% of all interest distributed by partnerships. Of that $6 billion, only about $1-2 billion was received by US households (a key statistic we asked Smith et al. (2022) to report); the rest was received by nonprofits, corporations, foreigners, and other partners. This $1–2 billion flow accounts for only around 5% of all pass-through interest received by households.[3] The assumption underlying the extrapolation made by Smith et al. (2022) to the remaining 95% seems to be that the legal form of ownership of a security (whether it is owned by a passthrough business or directly) determines the interest rate. The private funds responsible for the remaining 95% of pass-through interest have a much lower interest rate, however.

We quantify this issue using public data on US hedge funds, the largest type of private fund. Since 2013, the SEC has collected fund-level data on all private funds with more than $150 million in assets, including detailed asset compositions. These data are used by the Federal Reserve to establish the balance sheet of US domestic hedge funds. In Table 3 we combine these data with benchmark market yields, asset class by asset class, to estimate the interest rate earned by hedge funds in 2016. The table only includes US domestic hedge funds—the main vehicle through which US households invest in hedge funds—and excludes offshore funds—the main vehicle used by non-taxable investors (e.g., Love, 2022).[4] Two results are notable. First, US domestic hedge funds own an order of magnitude more in interest paying assets than the private funds studied by Smith et al. (2022): $1 trillion vs. $100 billion in 2016.[5] Second, they have a much lower interest rate: 2% vs. 6%.

If instead of using an interest rate of 6% to capitalize pass-through interest one uses 2.5%, the amount of interest-bearing assets owned by the top 0.01% rises by a factor of 1.6.[6] Capitalizing passthrough interest separately from other interest, however, is not a convincing methodology,

[3] Our $1–2 billion guess is based on the fact that out of the $181 billion in interest paid by partnerships in 2016, at most $31 billion was received by households ($31 billion being the total interest received by households from partnerships, S-corporations, and trusts). Applying this ratio to the $6 billion distributed by the "interest-only" partnerships of Smith et al. (2022) yields an estimated $1 billion received by households.

[4] The sorting is imperfect—some US individuals may invest in the offshore structure, and vice versa—but because it removes offshore entities entirely, Table 3 excludes the bulk of hedge funds' assets held by tax-exempt investors (e.g., non-profits, pension funds, foreigners). The Federal Reserve also publishes data on all hedge funds that report to the SEC, both domestic and offshore. Total fixed-income securities add up to close to $4 trillion in 2016 in these data, i.e., four times as much as in the domestic entities we consider.

[5] The Smith et al. (2022) private funds distribute $6 billion in interest in 2016 and have a 6% average interest rate, implying $100 billion in assets. Only around 1/6 belongs to households (see footnote 3). SEC private fund statistics suggest between 42.5% and 90% of US domestic hedge funds belong to US households.

[6] The average taxable interest rate of the top 0.01% (for passthrough plus non-passthrough interest) falls from 3.8% to about 1.9%, hence the corresponding assets are multiplied by about 2. Because municipal bonds—which are estimated separately—do not change, total interest-bearing assets rise by a factor of 1.6.

Table 3: Interest-Bearing Assets of Private Funds in 2016

	US domestic hedge funds		Smith, Zidar & Zwick sample	
Asset	Assets ($B)	Yield (%)	Assets ($B)	Yield (%)
Foreign currency	17	0.2	—	—
Checkable, time & saving deposits	49	0.2	—	—
Other cash & cash equivalents	91	0.5	—	—
Money market fund shares	75	0.1	—	—
Security repurchase agreements	76	0.4	—	—
US Treasury securities	202	1.2	—	—
Agency- and GSE-backed securities	16	1.2	—	—
Corporate and foreign bonds	435	2.6	—	—
G10 non-US sovereign bonds	163	0.3	—	—
Mortgage-backed securities	74	2.2	—	—
Corporate bonds	80	3.2	—	—
Convertible bonds	26	3.1	—	—
Other bonds	92	6.1	—	—
Leveraged loans	48	5.7	—	—
Other loans	22	12.7	—	—
Total	**1,032**	**2.0**	**100**	**6**

Source: Balance sheet of US domestic hedge funds is from the Federal Reserve Financial Accounts Table B.101f, 2016Q3 data. "Corporate and foreign bonds" are broken down into sub-components by applying the shares seen in 2016Q3 SEC private fund statistics for qualifying hedge funds' long exposures (Tables 40 and 41). Yields on deposits, other cash and equivalents, repos, and money markets are national rates on commercial deposits greater or equal to $100,000 for 12 month deposits, 36 month deposits, 12 and 36 months average deposits, and money markets, respectively (from FRED). Yield for "Leveraged loans" is from Morningstar. Yields for "Other bonds" and "Other loans" are the mean yields of "highly speculative" and "extremely speculative" bonds in Smith et al. (2022) Table B7, respectively. "Corporate bond" yield is the average of Moody's Baa corporate bond yield and S&P's international corporate bond yield. All other bond yields are from Standard & Poor's.

because how a security is owned (directly or through a partnership) does not determine its interest rate. Some passthrough funds have high interest rates (e.g., the Smith et al., 2022, sample); others have low rates (e.g., diversified funds that hold low-yield claims for liquidity). Smith et al. (2022) assign them the same rate simply because both are structured as partnerships. Vice-versa, a wealthy individual can instruct her wealth manager to invest in bonds A, B, C or to invest in a passthrough entity that holds bonds A, B, C. Even if these two portfolios have the same interest rate, Smith et al. (2022) assume they have widely different rates simply because income is reported to the IRS in different information returns. Whatever its practical limitations, the approach we favor—estimating interest rate differentials by wealth group based on matched estates-income tax data, see Saez and Zucman (2020)—has a rigorous conceptual basis. Using this method also increases the interest-bearing assets of the top 0.01% by a factor

of 1.6 and closes 30% of the gap between Smith et al.'s (2022) top 0.01% wealth share and ours.[7]

4 Value of Large Passthrough Businesses

An important contribution of Smith et al. (2022) is to estimate the value of passthrough business wealth (S-corporations and partnerships) using these businesses' profits, assets, and sales, and valuation multiples observed for listed firms in the same sector. There is a real value added in this approach because it relies on the actual financial performance of passthrough businesses and these businesses can be linked to their owners. However, issues in the implementation of this approach lead to downward-biased estimates of the business wealth of the top 0.01%.

First, there is a large bias in estimates of top-owned partnerships, because of issues caused by tiered ownership structures. Smith et al. (2022) value partnerships using information provided by the partnerships in which individuals have direct stakes. Consider partnership A (e.g., an oil firm) owned by partnership B (a holding) which is owned by individual Z. Smith et al. (2022) value A using B's tax return. One third of the valuation is based on profits before interest and depreciation (EBITDA), one-third is based on sales, and one third is based on assets. However, the sales, interest payments, and depreciation of A are not recorded by B. As a result the sales-based valuation is zero and the EBITDA-based valuation is too low by a factor of 2.5 (as interest paid and depreciation account for 60% of EBITDA on average in the partnership sector). Overall, the value of A is underestimated by a factor of 2.2 because information has evaporated in the intermediate structure. Moreover, when a business is owned through a trust, Smith et al. (2022) assign no value to it. Since ownership structures involving holdings and trusts are more prevalent among the rich, the bias is concentrated at the top of the distribution.[8] This issue could be addressed by linking partnerships, following Cooper et al. (2016), and then estimating values for the active businesses owned indirectly through such tiered structures.

Second, for all passthrough businesses with less than $50 million in profits, Smith et al. (2022) divide profits by 4, assuming that three-quarters of reported profits reflect labor income. The same division is applied for small passthroughs (e.g., a doctor's practice with 2 employees) and large passthroughs with up to $50 million in profits (e.g., a retail chain with thousands of employees). No justification is provided for the $50 million threshold. While an improvement on their earlier draft (Smith et al., 2021) which assumed that 3/4 of profits were labor income for *all*

[7] In Saez and Zucman (2016) we analyzed matched-estates income tax data and found a small interest rate premium for the rich post-Great Recession that we incorporated in appendix wealth distribution series. But we did not incorporate this premium in our benchmark wealth distributions. Smith et al. (2022) extended this analysis to more recent years and showed the interest rate premium of the rich appears to be a fixture of the post-Great Recession period, leading us to incorporate this premium in our benchmark series (Saez and Zucman, 2020).

[8] An illustration comes from Enterprise Products, one of the largest partnerships in the United States, which is a listed company. According to public SEC filings, heirs of the founder owned partnership units worth $18.5 billion in 2016, almost entirely through holdings and trusts. The Smith et al. (2022) methodology underestimates this wealth by a factor of 2.

passthroughs, this $50 million threshold is too high. A detailed comparison of S-corporations to similar listed firms and C-corporations suggests that the division by 4 is warranted only below roughly $5 million in profits (Saez and Zucman, 2020). Removing the division by 4 for firms with $5 to $50 million in profits increases S-corporation wealth by a factor of 1.2 in the top 0.01%-to-top-0.001% of the wealth distribution.[9]

The tiered ownership and profit issues interact. If a partnership is held through several holdings, each holding may have less than $50 million in profits even though the underlying business makes much more than $50 million—further biasing estimated wealth.[10]

The Saez and Zucman (2016, 2020) estimates, which value partnerships and S-corporations using solely business income (all of which flows through holding chains), do not suffer from these issues which account for the residual gap between Smith et al. (2022)'s top 0.01% wealth share and ours. We stress, however, that Smith et al. (2022) set the seeds for a genuine improvement in the estimation of passthrough wealth. Currently, their series and ours both match the aggregate amounts of passthrough business wealth recorded in the US Financial Accounts, which are conservative. Using instead their bottom-up estimates (after addressing the issues described above) would increase top-end wealth. Currently available estimates of wealth concentration should be seen as conservative.

5 Conclusion

Saez and Zucman (2020) and Smith et al. (2022) use the same definition of wealth and the same wealth totals to estimate the distribution of US wealth, but the methodology varies along a number of dimensions. Both sets of estimates are in close agreement about the level and rise of US wealth concentration, except for the top 0.01%, where Smith et al.'s (2022) estimates are lower. We identified, illustrated, and quantified the three main factors behind the discrepancy. Most saliently, Smith et al.'s (2022) methodology under-estimates the wealth of the richest people in America, whether they own publicly traded companies such as Jeff Bezos, Larry Page, Warren Buffett, Mark Zuckerberg, or private companies such as members of the Cargill-McMillan family, Michael Dell, Charles and David Koch, by an order of magnitude. With simple fixes the issues we uncovered can be addressed and estimates become very close in both levels and trends for all top groups.

Uncertainty remains about the true wealth of the top 0.01% and more research is needed to continue improving estimates of US wealth inequality. Due to the lack of administrative data on wealth and the complex holding structures and tax-planning strategies of the ultra-wealthy,

[9] As interest and depreciation account for 25% of EBITDA for S-corporations, the division by 4 of income biases the EBITDA-based valuation by a factor of 2.3, and the final valuation is 81% of the correct valuation.

[10] An illustration is given by Carl Icahn, the main owner of Icahn Enterprises (a listed partnership), who according to publicly available filings with the SEC owns this stake (worth $8.4 billion in 2016) through 5 holdings.

one has to combine a variety of data sources, make assumptions, and be open to revising earlier approaches when new information emerges. The general lesson of this paper is that an approach that is too exclusively based on tax data and does not incorporate relevant external information (such as reports to the SEC on large ownership stakes in listed firms) will generally fail to capture the actual level of wealth at the very top-end of the scale.

References

Batty, Michael, Jesse Bricker, Joseph Briggs, Elizabeth Holmquist, Susan McIntosh, Kevin Moore, Eric Nielsen, Sarah Reber, Molly Shatto, Kamila Sommer, Tom Sweeney, and Alice Henriques Volz. 2019. "Introducing the Distributional Financial Accounts of the United States," Finance and Economics Discussion Series 2019-017. Washington: Board of Governors of the Federal Reserve System.

Cooper M., J. McClelland, J. Pearce, R. Prisinzano, J. Sullivan, O. Zidar, and E. Zwick. 2016. "Business in the United States: Who Owns It and How Much Tax Do They Pay?," *Tax Policy and the Economy,* vol. 30: 91-128.

Love, Michael. 2022. "Where in the World Does Partnership Income Go? Evidence of a Growing Use of Tax Havens." Working paper.

Ogden, R. E., Thomas, D. R. and Warusawitharana, M.. 2016. "Corporate Equities by Issuer in the Financial Accounts of the United States." FEDS notes.

Saez, Emmanuel and Gabriel Zucman. 2016. "Wealth Inequality in the United States since 1913: Evidence from Capitalized Income Tax Data." *Quarterly Journal of Economics* 131, no. 2: 519-578. Updated series (post-2012) published at `http://gabriel-zucman.eu/usdina/`, Appendix Table II, Table series E and on `http://WID.world`

Saez, Emmanuel and Gabriel Zucman. 2020. "Trends in US Income and Wealth Inequality: Revising After the Revisionists." NBER Working Paper No. 27921.

Smith, Matthew, Owen Zidar, and Eric Zwick. 2021. "Top Wealth in America: New Estimates and Implications for Taxing the Rich." NBER Working Paper No. 29374.

Smith, Matthew, Owen Zidar, and Eric Zwick. 2022. "Top Wealth in America: New Estimates under Heterogeneous Returns." forthcoming *Quarterly Journal of Economics.*

Table A1: Equity Stakes of the Largest Individual Shareholders of Public Companies in 2016

		Equity stake ($B)			
Shareholder	Corporation	True value	Smith, Zidar & Zwick	Dividends ($M)	Realized gains ($M)
Warren Buffet	Berkshire Hathaway	72.1	0.0	0	0
Jeff Bezos	Amazon	60.7	5.3	0	1,429
Mark Zuckerberg	Facebook	53.4	1.2	0	320
Larry Ellison	Oracle	44.8	23.4	700	6
Larry Page	Alphabet	31.8	7.2	0	1,936
Sergey Brin	Alphabet	30.8	7.3	0	1,981
Jim Walton and family	Walmart	25.2	24.3	729	0
Alice Walton	Walmart	24.9	24.1	721	0
S. Robson Walton and family	Walmart	24.7	23.8	715	0
Steve Ballmer	Microsoft	15.7	11.6	383	0
Phil Knight	Nike	15.4	6.5	194	0
Harold Hamm	Continental Resources	14.6	0.0	0	0
Thomas Peterffy	Interactive Brokers	12.5	4.6	137	0
Charles Ergen	Dish Network	12.0	0.0	0	0
Adelson family trust	Las Vegas Sand	12.6	0.0	0	0
Bill Gates	Microsoft	11.4	15.5	269	1,758
Walton Family Trust	Walmart	10.3	0.0	0	0
Sheldon Adelson	Las Vegas Sand	19.3	34.6	1,039	0
Donald & Samuel Newhouse	Charter Communication	8.9	0.0	0	0
Carl Icahn	Icahn Enterprises	8.4	4.2	—	—
Rupert Murdoch	Twenty First Century Fox	8.3	3.4	103	3
Lukas Walton	Walmart	8.2	7.9	236	0
Elon Musk	Tesla	7.7	2.2	0	593
Eric Schmidt	Google	7.0	0.1	0	16
Leonard Lauder	Estée Lauder	6.9	4.4	112	169
Alejandro & Andres Santo D.	Anheuser-Busch InBev	6.8	0.0	0	0
Bill Gates	Canadian Railways	6.8	3.8	113	0
Laurene Powell Jobs	Disney	6.7	19.3	96	4,342
Micky Arison	Carnival Cruise	6.6	5.7	170	0
Stephen Schwarzman	Blackstone	6.3	2.4	—	—
Bill Gates	Republic Services	6.2	4.5	135	0
Charles Schwab	Charles Schwab Corp.	5.6	1.4	38	48
Thomas Frist & family	HCA Healthcare	5.1	0.0	0	0
Richard Kinder	Kinder Morgan Inc	5.1	4.1	123	0
Dannine Avara	Enterprise Products	4.6	2.3	—	—
Scott Duncan	Enterprise Products	4.6	2.3	—	—
Milane Franz	Enterprise Products	4.6	2.3	—	—
Randa Williams	Enterprise Products	4.6	2.3	—	—
Dave Duffield	Workday	4.2	1.0	0	263
Charles Johnson	Franklin Resources	4.1	2.5	74	0
Christy Walton	Walmart	4.1	3.9	118	0
Tamara Gustavson	Public Storage	3.7	4.0	120	0
John Malone	Liberty Media Corp & other	3.6	0.4	0	100

Jan Koum	Facebook	3.5	5.6	0	1,507
Ralph Lauren	Ralph Lauren	3.4	2.5	75	2
Bill Gates	Ecolab	3.3	1.3	40	0
George Kaiser	BOK financial corporation	3.3	2.3	69	0
Bill Gates	Deere	3.2	2.5	75	7
Len Blavatnik	LyondellBasel	3.1	4.0	120	0
Pierre Omidyar	Paypal	2.8	0.0	0	0
Pierre Omidyar	Ebay	2.1	0.0	0	0
Sumner Redstone	CBS	1.9	0.7	20	0
Peter Thiel	Paypal	1.9	0.0	0	0
John Doerr	Alphabet	1.6	0.1	0	34
Sumner Redstone	Viacom	1.5	1.6	47	0
Les Wexner	L Brands	1.5	4.0	120	0
Charles Ergen	Echostar	1.5	0.0	0	0
Ron Perelman	Revlon	1.2	0.0	0	0
Bill Gates	Berkshire Hathaway	1.1	0.0	0	0
Steven M. Rales	Fortive corporation	1.0	0.1	3	0
Bill Gates	Waste Management Inc	0.9	0.7	22	0
Rupert Murdoch	News Corp	0.9	0.5	16	1
Bill Gates	Autonation	0.9	0.0	0	0
Lukas Walton	First Solar Inc	0.7	0.0	0	0
Steven M. Rales	Colfax corporation	0.7	0.0	0	0
Robert Rowling	Northern Oil and Gas	0.3	0.0	0	0
Tamara Gustavson	American Homes 4 Rent	0.3	0.1	3	0
Total top 120 of Forbes list		683	300	6.9	14.5
Total next 280		182	106	2.5	6.0
Total Forbes 400		**865**	**406**	**9.4**	**20.5**

Notes: This table reports equity stakes in public companies owned by individuals named in the 2016 *Forbes* 400 list. All numbers are fully based on publicly available information. True equity stakes and realized capital gains are computed using SEC form 4 and form 13D disclosures, retrieved from the SEC Edgar database. Dividends are from annual 10-K forms. All data are for 2016, except for Steve Ballmer's stake in Microsoft which is for 2014 (the last year it can be observed in SEC filings). The Smith, Zidar and Zwick values are computed by multiplying dividends by 33.4 and capital gains by 3.7. For listed partnerships they are computed using publicly-available sample Schedule K-1 (Blackstone) or dividing the true market value by 2 (Enterprise Products, Icahn Enterprises) following the discussion in Section 4. For equities owned by trusts for which public data show that trust income does not flow to beneficiaries (Las Vegas Sand family trust, Walton Family trust), Smith, Zidar and Zwick values are zero. All identifiable stakes of the top 120 wealthiest individuals according to Forbes are listed, except when they represent negligible amounts. Holdings, dividends, and capital gains realizations of the next 280 are extrapolated from the top 120 excluding the top 10 (e.g., the dividend yield of the next 280 is assumed to be equal to the dividend yield of the top 120 excluding the top 10, which is 1.4%).

Table A2: Top 20 Private Firms by Revenue in 2016 According to *Forbes*

Company Name	Revenue ($B)	Type of firm	Sources
Cargill	120.4	C-corp	Full accounts for fiscal year closed May 2017 available from bond prospectus (https://sec.report/lux/doc/100258240.pdf). Dividend payment of $428m, only 15% of net earnings. Valuation: average price-to-sales ratio of Farming-agriculture & food processing sectors.
Koch Industries	100	C-corp	Public petition in Illinois tax tribunal in 2015 reveals Koch industries files as a C-corp (https://itt.illinois.gov/ED_CMS/DocHandler.ashx?File=Documents/1426%2Fe8cf04e5-a679-4fdb-a607-e1a2715f07df%2F1.++Petition.pdf). Dividends in Table 2 based on average 2013-18 AGI of Charles Koch ($213m) disclosed by ProPublica (https://projects.propublica.org/americas-highest-incomes-and-taxes-revealed/), implying $507 million in total dividend distributions, consistent with SEC 99.3 exhibit mentioning that "90% of profits are reinvested" (https://www.sec.gov/Archives/edgar/data/41077/000119312505225958/dex993.htm). Revenues and ownership shares (42% for Charles and David Koch each) from Forbes. Valuation: average of oil-distribution & diversified sectors.
Albertsons	58.7	C-corp	Full pre-IPO accounts are publicaly available (https://d18rn0p25nwr6d.cloudfront.net/CIK-0001646972/99d5e8ce-2473-4dfe-8232-6e0af3ef3f52.pdf). No dividend in 2016. Company owned by a private equity fund as opposed to individuals, hence removed from Table 2.
Dell	54	C-corp	Full accounts for 2016 available in 10-K (Dell was public up to 2013 and again in 2018). Data are retrieved from CapitalIQ and are for fiscal year ended Jan 29, 2016. No dividend in 2016. Use January 2016 price/sales ratio of computers/peripherals for valuation. Preferable to using FY2017 data because of merger with EMC (which owned VMWare) in 2016 and accounts are consolidated with EMC since Sept. 7, 2016 (date of Dell-EMC merger). Forbes reports $59B in revenue in 2016 (a bit higher than in 10-K, unclear why). Large debt post 2013 LBO so Financial Accounts valuation probably too high. Michael Dell owns ~50% of Dell from SEC filings.
PricewaterhouseCoopers	35.4	Partnership	Assumed partnership
Deloitte	35.2	Partnership	Assumed partnership
Mars	33	C-corp	Public petition in Illinois tax tribunal in 2019 (for tax year 2016) reveals Mars Inc files as a C-corp (https://itt.illinois.gov/ED_CMS/DocHandler.ashx?File=Documents/6172%2F929ea312-cb84-489b-aa3f-dc86f52e6f9a%2F1.+Petition.pdf). Evidence of low dividend distribution: (1) "The shareholders reap less than a tenth of profits as dividends." (The Economist, https://www.economist.com/business/2022/06/30/mars-inc-gets-the-purpose-v-profit-balance-right); (2) analysts with access to prive accounts noting the company has $3B in free cash flow in 2019 and "doesn't have a lot of demand from its private owners to be increasing the dividend significantly, which is why their free cashflow is so good." (https://www.ifre.com/story/1591363/mars-inc-us5bn-bond-garners-us28bn-book-pqzjcjdttm)
Publix Super Markets	32.6	C-corp	Publicly available accounts (https://www.sec.gov/Archives/edgar/data/81061/000008106120000006/publix-10kx12282019.htm) shows distributes 1/3 of net earnigns as dividends. Partly workers-owned, partly owned by Jenskins family (https://www.forbes.com/profile/jenkins/?sh=3824a5f060e8).
Bechtel	32.3	S-corp	Source: https://www.propublica.org/article/secret-irs-files-reveal-how-much-the-ultrawealthy-gained-by-shaping-trumps-big-beautiful-tax-cut
C&S Wholesale Grocers	30	S-corp	"A 2010 bond offering prospectus showed the company had a gross profit margin of 2.2 percent and net income of $66 million on $19.3 billion in sales in 2009. As the company's owner, Cohen opted to let C&S corporate income pass through to be taxed as personal income the document shows" https://www.gazettenet.com/Archives/2013/08/cohen-hg-080813
Ernst & Young	28.7	Partnership	Assumed partnership
Reyes Holdings	25	Unknown	
HE Butt Grocery	23	C-corp	"H-E-B to Grant Stock to 55,000 Employees… & will donate over 5 percent of pretax earnings annually to non-profit organization": https://www.heb.com/static-page/article-template/partner-ownership-plan.
Pilot Flying J	22.9	Unknown	Partly owned by Berkshire Hathaway so not an S-corp. FTC filing suggests it's a C-corp: https://www.ftc.gov/sites/default/files/documents/cases/2010/06/100630pilotflyingjcmpt.pdf. But cannot entirely rule out it's a partnership
Enterprise Holdings Inc	19.4	C-corp	Owned by the Crawford group (owned by Taylor family), so not an S-corp. Rating agencies consistently mention prudent dividend payout (in 2016 dividend payout of 32% of net income).
Cox Enterprises	18.1	C-corp	Full financials for 2013 published by Fitchratings (https://www.fitchratings.com/entity/cox-enterprises-inc-80089180#fitch-adjusted-financials), show it's a C-corp that distributed 0 dividend that year; small dividend distributions in other years.
Southern Glazer's	17	Unknown	
Cumberland Gulf Group LP	16.5	Unknown	
Meijer	16.1	Unknown	
Fidelity Investments	15.9	Unknown	Press article discusses plans to convert to S-corp in 2007 (http://archive.boston.com/business/globe/articles/2007/11/03/fidelity_changes_its_corporate_structure/) but unclear if this was done because had more than 100 shareholders. 2018 Moody's report claims it is set to benefit from TCJA lower corporate tax rate (https://www.moodys.com/research/Moodys-upgrades-FMR-LLCs-senior-unsecured-debt-rating-to-A1--PR_382834)

Notes: This table shows that at least 13 of the 20 largest private businesses by revenues were organized as C-corporations in 2016. Many had low or zero dividend yields (see notes) and hence are massively under-valued by the Smith et al. (2022) methodology.