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Private business wealth and rates of return in the United States*

Jesse Bricker
Federal Reserve Board of Governors

Kevin B. Moore
Federal Reserve Board of Governors

Alice Henriques Volz
Federal Reserve Board of Governors

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Abstract

Privately-owned business assets are the largest source of wealth for many of the wealthiest families across the world. Measurement issues typically hamper our understanding of private business income and assets, but we use business income and valuations in the Survey of Consumer Finances (SCF) after showing that they align with external aggregates. With the exception of the years leading up to the Global Financial Crisis, overall rates of return on public firms have generally outpaced rates of return on public firms during the past 30 years.

1. Introduction

Privately owned business assets are the largest source of wealth for most of the wealthiest families in the United States (Bricker and Volz, 2020; Smith, Zidar, Zwick, 2021; Saez and Zucman, 2020) and across the world (Fagerang et al 2019; Bach et al 2016; Bach, Bartels, and Neef, 2020). Income generated from these firms has also served to increase income concentration in recent years (Smith, Yagan, Zidar, Zwick, 2019; Saez and Zucman, 2020; Austin and Splinter 2020). Accordingly, the future path of wealth and income concentration will be governed by whether the return on private equity outpaces returns on assets held by less-wealthy families.

In this paper, we use owner-reported values of privately held business wealth and income from the Survey of Consumer Finances (SCF) to describe trends in private business equity and estimate rates of return for private business equity. The SCF data have clear benefits: business income and wealth are measured independently in the SCF, in contrast to efforts that use income tax data to infer business wealth. Importantly, the SCF oversamples wealthy families by using tax data, which ensures that the coverage of the top—where private business wealth is concentrated—is comparable to the income tax data (Bricker, Hansen, and Volz, 2019).

Due to inherent difficulty in measurement, the starting point for many researchers is to be skeptical of private business wealth and income data, especially so for survey data. In Bhandari, Birinci, McGratten, and See (2020, hereafter BBMS20), for example, SCF business income is described as too large and business valuations too small, with the consequence that central questions in public finance may need to be revisited. BBSM20 conclude that previous work estimating lower rates of return on private equity than public equity (Moskowitz and Vissing-Jorgenson, 2002— hereafter MVJ02—and Kartashova, 2014) should be overturned in favor of their alternate results.

As a first matter of business, we demonstrate that business income in the SCF aligns closely to external aggregates from the IRS—after correcting what we view as conceptual mistakes in BBMS20. Next, we show that business valuations in the SCF are well-anchored from business fundamentals estimated from Compustat firms.[1] Finally, we re-calculate public and private equity rates of return using a method described in BBMS20, though we are careful to remove the

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[1] Our results on SCF business valuations are similar to those produced in contemporaneous work by Campbell and Robbins (2022).

labor share of private pass-through business income to make it comparable to income from public firms. With this correction, rates of return on private business calculated in MVJ02 and Kartashova (2014) are confirmed rather than repealed. Public returns outpaced private returns in the 1990s, with the trend reversing in the lead up to the Global Financial Crisis.

We provide updated estimates for the period since the Financial Crisis, when aggregate returns on public firms have slightly outpaced private firms (figure 3b). This conclusion is invariant to the method of separating capital and labor income in pass-through business income (adding in new methodologies from Saez and Zucman, 2020, hereafter SZ20, and Smith, Zidar, and Zwick, 2021, hereafter SZZ21, to the approach detailed in MVJ02).

This paper proceeds as follows. Section 2 describes the SCF private business data and comparable income tax data. We note that the differences between the SCF and income tax aggregate income noted in previous work (BBMS20) may have been founded on misinterpretation of the SCF codebook that especially affects the comparison of partnerships. In section 3, we provide appropriate comparisons to income tax data, which show that aggregate SCF business income is typically larger but that income tax aggregates are generally within a 95% confidence interval around SCF aggregates (figure 1, panel d).

In section 4, we gauge whether private business valuations are governed by similar fundamentals to public firms, by using CRSP/Compustat data to generate predicted SCF business valuations. We apply value-to-income and value-to-sales ratios—by industry and year—from CRSP/Compustat to SCF business sales and income data. These predicted SCF business valuations are comparable to self-reported SCF business values (figure 2), indicating that self-reported values are grounded in fundamentals. Section 5 presents our estimates of public and private rates of return, and Section 6 concludes.

2. Data: the SCF, CRSP/Compustat, and income tax data.

A. SCF data

The SCF is a cross-section survey, conducted every three years by NORC on behalf of the Federal Reserve Board (FRB) and with the cooperation of the Department of Treasury (SOI).[2] The survey combines a wealthy oversample with a nationally representative set of families, and

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[2] See Bhutta et al., 2020 for results from the most recent triennial SCF.

collects a comprehensive snapshot of the assets, liabilities, income, and demographic characteristics of these families.

Income and wealth from private businesses are increasingly important for wealthy families (Smith, Yagan, Zidar, and Zwick, 2019, hereafter SYZZ19, SZZ21, SZ20, Bricker, Goodman, Moore, and Volz, 2021, hereafter BGMV21) and the sampling techniques in the SCF ensure that wealthy families are well-represented in the data. The SCF identifies wealthy households to sample by predicting wealth based on administrative records derived from income tax returns, verifies that wealthy families participate by grouping sampled families into narrow classes of increasing wealth, and targets response rates in each wealth group. The set of wealthy families that respond mirrors that of SCF wealthy nonrespondents (BGMV21).[3]

i.   *Business income, business assets, and business traits in the SCF*

The SCF questionnaire includes detailed questions on up to two actively-managed private businesses. For each business, owners are asked questions about the family's ownership share, the net worth of that share of the firm, total income and sales of the firm, industry, number of employees, and legal business organization, along with a battery of questions about the businesses finances. Summary questions are also asked about any additional actively-managed businesses over two. In addition, a set of less detailed questions—income, net worth, cost basis and business organization—are asked for any other businesses that are owned but not actively managed by the family.

The questionnaire asks business owners to report the business income with the question: "what was the business's total pre-tax net income in [the year prior]?". Despite reports to the contrary in BBMS20, this is the entirety of the question text, and it neither refers to the concept of ordinary business income nor does it refer to lines on a tax form.[4] Business owners can be

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[3] The SCF cannot sample families in the *Forbes* 400, leading to under-coverage at the very top of the wealth—and income—distribution. However, under-coverage does not arise until the extreme top: the wealthiest SCF families have wealth comparable to the lower end of the *Forbes* 400 (Vermuelen (2018), Kennickell (1999)), and replacing the top end of the SCF wealth distribution yields similar results to appending the *Forbes* wealth to the SCF (Bricker, Hansen and Volz, 2019). Though we have developed ways of incorporating the Forbes wealth in general, we do not have detailed enough balance sheets to include them in this analysis, and what we present here does not include these families.

[4] Though BBMS20 write that the SCF business section income variable (x3132) asks respondents to report business income found "on special lines of IRS tax forms", this is not the case. The SCF codebook does include an aide for the field interviewer (denoted by the all-caps text "READ ONLY IF NECESSARY") that is not part of the question text that mentions ordinary income. However, these interview aides—called a "screen instruction"—are written as part of a multi-layered strategy to aid the interviewer when there is confusion over the meaning of survey question.

paid in many forms—ordinary business income, dividends, interest, and capital gains, among others—and ordinary business income represents a relatively small share of that total, especially for partnerships (Di Carlo and Shumovsky 2019; Cooper et al. 2016). While BBMS20 compare SCF business income to tax data on just ordinary business income, our comparisons assume that respondents are free to include all forms of income from their owned businesses that can flow to them.[5]

Though business owners do not report income in the business section after a prompt for tax forms, later in the survey, all respondents are asked to enumerate all income sources after a prompt to refer to a personal tax filing and with questions that are framed according to a personal income tax form. Business income from Schedule C and E in this section aligns well with records from personal income filings (appendix figure 1). Business income from each of the two sections need not agree. As noted above, businesses can have more than one way of paying out owners. Further, the income section refers to all income from the prior year and the business section refers to current businesses (but income from the prior year); in the case where a business started or folded in the current year, there may be differences in timing.

B. Income tax filings

The Statistics of Income (SOI) at the Internal Revenue Service (IRS) produces business income statistics based on samples of tax filings from S corporations (Form 1120S), C Corporations (Form 1120C), partnerships (Form 1065), and sole proprietorships (Schedule C). We use publicly available tables from the SOI Integrated Business Dataset (IBD) that summarize income from these businesses, including many forms of income from businesses that are paid out to owners: ordinary business income, dividends, interest, capital gains, and other forms of capital income.[6] For business owners, these income sources then flow to various lines on the individual

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Screen instructions in the SCF are not a part of the question text, are only visible only to the interviewer, and are only read aloud when the SCF respondent is confused about the intent of a question and when the first two layers of interventions have been exhausted. An unsystematic poll of SCF interviewers reveals few instances of referring to this screen instruction.

[5] BBMS20 allocate 32 percent of the total ordinary business income in the IRS partnership returns data to individuals. Cooper et al (2016) show that the share of *all* partnership income—including ordinary business income, dividends, interest, capital gains, and other forms of income—that flows to individuals is about 32 percent but is silent on the share of ordinary business income that flows to individuals.

[6] The income definition that we use is generally consistent with that in the SOI Integrated Business Dataset (IBD). We depart in two ways. First, the main IBD data include ordinary business income, interest, dividends, and rental income but exclude capital gains. We include capital gains in our measure using the IBD data. Second, the IBD data encapsulates partnership payouts all partners, which may be (a) individuals, (b) corporate partners, (c) tax-exempt

1040 form: Schedule C profits flow to the self-employment line, ordinary business income from S Corporations and partnerships flow to the Schedule E line (and are broken out across business types in Schedule E), and dividends, interest, capital gains, and other forms of capital income flow to their respective lines on the 1040 return. These additional forms of capital income from businesses are found on K1 returns, filed by the firm on behalf of each owner.

As in BBMS20, we compare the income from the SCF business section to the IDB business income data. Despite the variety of business income payout options available to owners, BBMS20 focus only on ordinary business income in the tax data. In the case of partnerships, the IDB does not break out total ordinary business income that flows to individual owners, so BBMS20 allocate 32 percent of the total ordinary business income in the IRS partnership returns data to individuals, assuming that the share of *all* partnership income—including ordinary business income, dividends, interest, capital gains, and other forms of income—that flows to individuals in Cooper et al (2016) can be applied to just ordinary business income.

Business income in the tax data is often found to be significantly under-reported to the tax authority in audit studies (GAO, 1995; GAO, 2015; Guyton et al, 2021). As in BBMS20, then, we compare the SCF business income to the IDB business income data after adjustments for under-reporting. Our baseline assumption is that S and C Corporate income are under-reported at an 18 percent rate, as a range of audit studies has found under-reporting by 15 to 20 percent (Johns and Slemrod, 2010; Guyton, et al., 2021; GAO, 2015; IRS, 2016). With no recent audit studies of partnerships, we take a range of possibilities for under-reporting.[7] One option—taken

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partners, (d) nominee partners, and (e) other partnerships. To be closer to the type of partnerships captured in the SCF, holdings by households, we first limit to payouts to individual partners ((a) above) and exclude payouts to corporate partners and tax-exempt partners ((b) and (c) above). In some iterations, we include half of payouts to "nominee and other" partners ((d) above), which are often estate and trusts that can be reported by SCF respondents. Payouts from partnerships to other partnerships ((e) above) are the largest form of payout but are typically an intermediary step to the final payout to individuals, corporate, nonprofit, and nominee partners, and we generally exclude all of these payouts. That said, the best effort at tracing these flows (Cooper et al 2016) cannot trace back 15 percent of these payouts to other partnerships, and, in one iteration, we include a share of that untraceable payout, assuming that at least part may accrue to individuals even if not on a tax form.

[7] The most recent was based on 1982 income, which found partnership income was under-reported by 26 percent (GAO, 1995). Partnerships must pay out profits every year to their partner owners but can be arranged in ways that make it hard to trace income to a final recipient. Partnerships are often set up in layered tiers, whereby one partnership pays profits to another partnership. About one-third of all partnership profits are paid out to such intermediaries (Di Carlo and Shumovsky 2019), and these tiers are often set up in circular closed fashion, whereby these intermediary profits cannot be traced back to a final owner (Cooper et al 2016). About 15 percent of such partnership income cannot be traced back to their owners' tax returns, making it difficult for the tax authority to know the ultimate owner of the profits (Love, 2021).

by BBMS20—adjusts partnership income under the assumption that only about 50 percent of such non-corporate income is reported to the tax authority, as assumed in the U.S. NIPA tables (BEA, 2019). Another option assumes that partnerships under-report at the same rate as S Corporations (as in GAO, 2015). Another option assumes an 18 percent under-reporting rate, as in S Corporations, along with smaller under-reporting corrections for other capital income payouts (as in Guyton, et al., 2021).

In contrast to BBMS20, our comparisons include all forms of income that can flow to individuals—a net income concept that is in agreement with the SCF business income question discussed earlier and recognizes the variety of forms of owner payouts.[8] Our measure of total and partnership income in the IDB data is (a) much larger than that in BBMS20 and (b) generally falls in the 95 percent confidence interval around the SCF partnership aggregate (figure 1, panel b and d). Both our measure and the BBMS20 measures of partnership income are augmented using under-reporting corrections used in the literature.

C. CRSP/Compustat

Valuations of public firms are maintained in the CRSP database, while accounting details of each firm are maintained by Compustat. We merge the two datasets to get prices, income, firm size, sales, and other variables on active and inactive public firms (Wharton Research Data Services, 2020). We then construct multiples of market value-to-sales and market value-to-income by broad industry categories in each year. As in BBMS20, we use the pre-tax income variable in Compustat, which is similar to the SCF business income question ("what was the business's total pre-tax net income in [the year prior]").[9]

Income from private businesses is different from income from public corporate firms found in Compustat. First, the corporate pre-tax income concept (from Form 1120) includes business income along with interest, dividends, rent, and capital gains. Taxable business income for private pass-throughs, though, is generally just business income; any interest, dividends, rent, and capital gains may be included on a pass-through business tax form (1120S, 1165, or

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[8] Our comparison of SCF partnership income to a broader partnership income measure would be moot if the SCF business section income question directly refers to ordinary business income. However, the text for this question ("What was the business's total pre-tax net income in [the year prior]") references neither ordinary business income nor income tax returns.

[9] SZZ21 use the EBITD business income concept in Compustat, which adds interest payments on loans and depreciation back to business income.

Schedule C) but are not included as business income. Second, corporate business income is income that flows from capital, but pass-through business income is a mix of capital income and labor income of the owners—tax rules and other factors mean that owners often choose to realize profits rather than salary (MVJ02, SYZZ19, SZ20, SZZ21).

In our comparisons of the SCF private business income and the firms in Compustat, we will remove labor income from pass-through business income, as in the recent literature (MVJ02, SZ20, SYZZ19). For example, we construct value-to-income and value-to-sales multiples from the Compustat data, and when applying these multiples to the SCF data, we apply them only to the capital component of pass-through business income (SZZ21). Further, the evidence that we present in figure 1 supports the idea that the SCF business section is picking up more than just ordinary business income in the pass-throughs, and in-line with income reported on the corporate form.

3. Business Income

Business income collected in a household survey may be different from business income collected for income tax purposes for many reasons; respondent recall bias and differing business income concepts are just two examples. We begin, though, by demonstrating that aggregate business income in the SCF aligns with aggregate business income in the IDB data produced from business income tax returns.[10]

In Figure 1a, we plot aggregate SCF business income of sole proprietorships in the SCF and in the income tax return data (orange lines). The income tax return data includes all Schedule C income, including sole proprietorships and self-employment income from those who would not consider themselves business owners (such as freelancers, side-gigs, those who receive a 1099-MISC). The SCF business section, though, includes only a subset of these filers: those who consider themselves as owning a business. Starting in 2001, the SCF began collecting all of Schedule C income later in the survey; this amount is plotted in green. Prior to 2001, then, we plot the subset of Schedule C filers who also report owning a business (in blue). Aggregate SCF sole proprietor income is larger than the un-augmented IRS data and nearly as large as IRS data

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[10] We focus only on pass-through businesses in this section, omitting a treatment of private C Corporations captured in the SCF. Private C Corps are small in number and there is no natural comparison data. In later sections, though, we include private C Corps.

augmented by 90 percent, as in the under-reporting corrections used by BEA (2019) and BBMS20.

The biggest differences in business income noted in BBMS20 are in partnerships, and partnership income collected in the SCF business section (blue line, panel b) is considerably larger than the ordinary business income reported in BBMS20 (red line), even after BBMS20 augment this income by more than 90 percent for under-reporting (dashed red line).[11] The BBMS20 measure, though, is an estimated allocation of individuals' aggregate ordinary business income\.[12] The IRS releases aggregate ordinary business income that flows to individual returns (Statistics of Income, 2019, for example), and the BBMS20 measure is often half of that total. Our proposed measure augments ordinary business income by the BBMS20 under-reporting adjustment and adds other income from partnerships that flows to individual returns—interest, dividends, capital gains, and rent. These adjustments increase aggregate partnership income considerably (dashed orange line) and is typically close to the lower bound of the 95 percent confidence interval surrounding the SCF estimate.

Other ways of measuring income from partnerships that accrue to households yield similar aggregates. Counting all income from partnerships in the partnership returns that flow to individuals—with ordinary business income augmented by only by 20 percent and other capital income by 8 percent (as in GLRRZ21)—and including half of partnership income that flows to trusts and estates yields the dotted orange line in figure 1b. Though estates and trusts operate in a legal limbo, estate and trust assets are captured in the SCF, and businesses owned by trusts and estates can be counted in the SCF business section.

Aggregate business income from S Corporations owned by SCF families is shown in panel C of Figure 1, and it is plotted with aggregate income of S Corporations from all sources in the IRS S Corporation returns data. S Corporations mainly produce ordinary business income, and the SCF aggregate values are generally comparable in magnitude and in time trend.

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[11] The mapping from business organization to business tax filing is straightforward for most firms. LLCs, though, have a choice in how to file business returns. We classify all multi-owner LLCs as partnerships for tax filing purposes and classify solo-owner LLCs without other employees and without Schedule C income (x5703=5) as a partnership, too. The remaining solo-owner LLCs without other employees are classified as sole proprietors (https://www.irs.gov/businesses/small-businesses-self-employed/single-member-limited-liability-companies).

[12] The BBMS20 measure is 32 percent of total ordinary business income generated by partnerships, based on 32 percent of overall partnership income flowing to individuals in Cooper et al (2016). Love (2021), though, shows that individuals get a disproportionate share of business income.

Figure 1. Business income in the SCF and SOI, by business organization
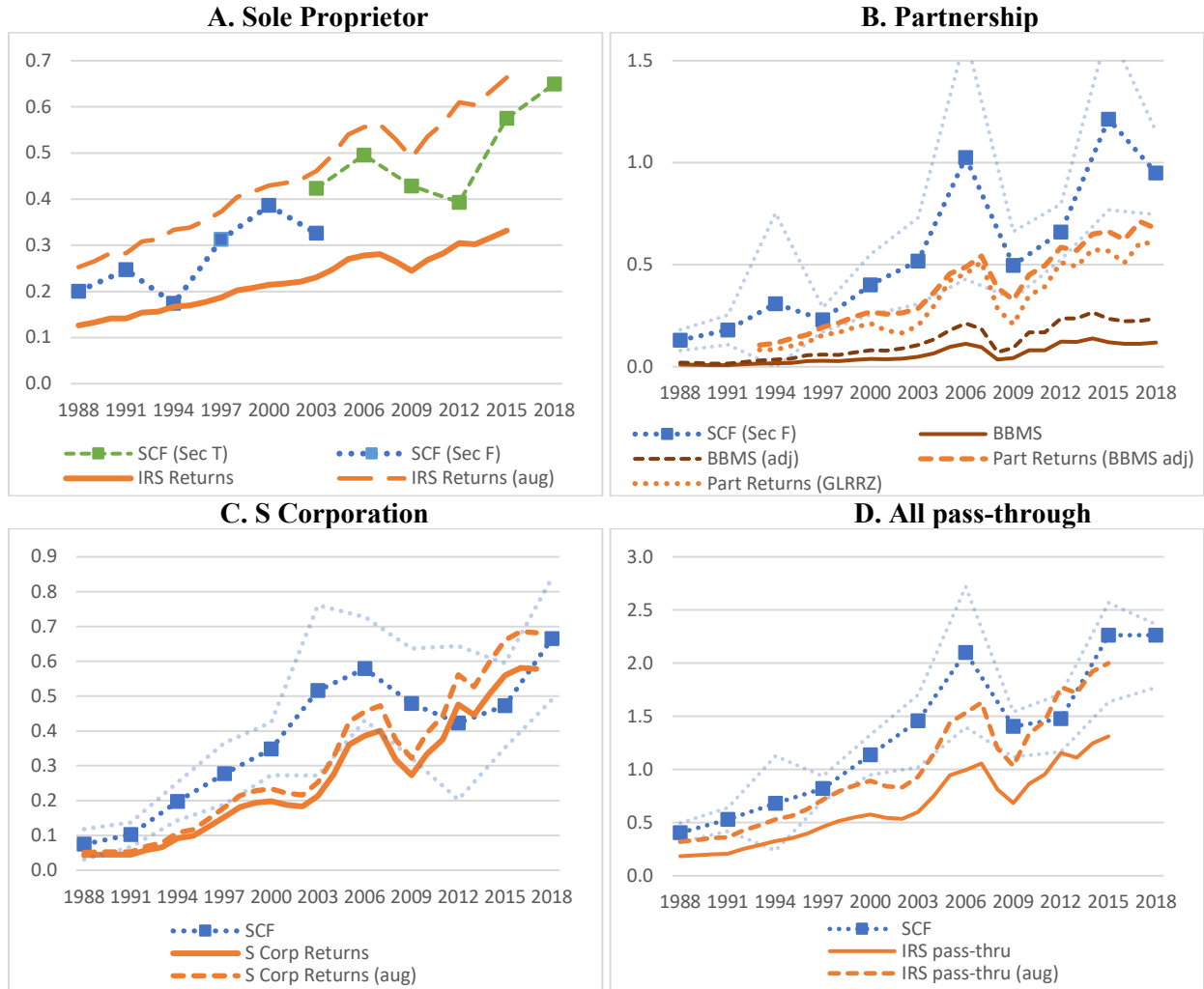
Note: author's calculations from Survey of Consumer Finances and Statistics of Income Integrated Business Data (IBD) public data on partnership, sole proprietor, and S Corporation tax returns. All y-axes in $trillions (nominal). Light blue lines plot aggregate income from SCF business section (Section F). Dark orange lines are tax return aggregates, dashed lines are tax return aggregates after adjusting for underreporting. Adjustments are 90 percent of total for sole proprietor income in panel (a) (as in BEA 2019 and BBMS20), and 20 percent for S Corporations (as in GAO, 2015 and BBMS20) in panel (c). In panel (b), dark red solid line is from BBMS20, and represents 32 percent of aggregate ordinary business income from partnership tax filings (BBMS20's allocation to individuals). The dark dashed line augments the solid red line by 90% to account for non-corporate under-reporting, as in BEA, 2019 and BBMS20. Orange lines are our calculations using IRS partnership returns of income allocated to individuals. Dashed orange line uses INSOLE partnership income and augments by 90 percent (as in BBMS) and then adds all other income received by individuals from partnerships (e.g., in Table 5 of SOI partnership return data). Dotted orange line augments partnership income that flows to individuals as in Guyton et al (2021): 20 percent under reporting for business income and 8 percent for other income, and in half of income to nominee partners (trusts). The solid orange line further adds some income that flows to partnership intermediaries that cannot be traced to any other entity (Cooper et al 2016 cannot trace back 15 percent of all income that flows to partnerships, we assume that at least some accrues to households, even if it doesn't appear on an individual tax return).

4. Business Values

In the SCF data, private business wealth is the most important component of the wealthy asset portfolio (Bricker and Volz, 2020), as is the case in Sweden (Bach et al, 2020), Norway (Fagerang et al, 2020), Germany (Bartels et al, 2020) and others. But private business values in the SCF may be too low due to undervaluing of intangibles (BBMS20) or too high due to overly optimistic owners (SZZ21). Gauging the accuracy of values is challenging because there are few sources to use as a comparison. The Financial Accounts provide aggregate estimates of total non-corporate, nonfinancial business valuations held by the household sector. The SCF aggregate is larger than the B.101.h value, but the FA data are (a) modeled, partially from tax data, (b) a mixture of book and market values (Batty et al, 2019), and (c) do not include financial firms, the largest industry among partnerships, leading to lower aggregates that the market-based SCF measure but with comparable trends over time (appendix figure 2).[13]

Absent an ideal benchmark for private firm valuations, we turn to data on public firms as an imperfect gauge of respondent-reported SCF valuations. To do so, we first calculate both value-to-sales and value-to-income ratios in each year and for eight broad industry classes from public firms in the CRPS/Compustat data.[14] We then predict business valuations for each private SCF firm by applying these multiples to the sales and income reported in the SCF. Our predicted valuations model is a weighted average of these two predictions, a modified version of SZZ21's model:

$$\widehat{bus}^{scf} = \sum_{\forall k} \frac{1}{2} \times \left[sales^{scf} \times \left(\frac{value}{sales} \right)_k^{Comp} \right] + \frac{1}{2} \times \left[\theta income^{scf} \times \left(\frac{value}{income} \right)_k^{Comp} \right],$$

where $\left(\frac{value}{sales} \right)_k^{Comp}$ and $\left(\frac{value}{income} \right)_k^{Comp}$ are generated from Compustat/CRSP linked data for eight industry classes (k) for each SCF year.[15] The scalar θ describes the share of income that is retained after removing the labor income inherent in pass-through business income. Unlike corporate profits, pass-through business income are often a mix of capital and labor income:

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[13] Alternatively, there is data on transacted private businesses—such as Pratt's Stats— but have the same sample selection issues found in real estate transactions data (Gallin et al 2019), combined with a much thinner market. That said, the distribution of returns in Pratt's Stats (from BBMS20 table 1) is comparable to the SCF returns shown here.
[14] Appendix tables 3 and 4 provide more details on the overall and by industry comparisons.
[15] Firm assets are also used in the SZZ21 model but omitted here because the SCF does not collect this data.

because of lower tax rates on capital income, owners of pass-through businesses have an incentive to pay themselves out of business profits rather than salary.[16]

Predicted SCF private business wealth described by the above equation are shown in the blue lines in figure 2, using leading examples of how to account for separate labor and capital income for business owners.[17] In MVJ02, for SCF business owners who do not report being paid a wage, we remove from their business profits a predicted wage income. SCF business values predicted under this correction are shown in the dotted line. More recently, SYZZ19 estimate that 75 percent of pass-through business income should be classified as labor income. The long-dashed line in figure 2, then, predicts business valuations when retaining 25 percent of business income (allocating 75 percent to labor, as in SYZZ19). The short-dashed line keeps the capital-labor allocation of SZZ21 for small firms but retains 75 percent of business income in larger firms, following the findings in SZ20. Overall, the SZ20-based method classifies about 50 percent of business income as labor income, similar to Bhandari and McGratten (2021).

There are several notable features of figure 2. First, the predicted business values using Compustat multiples are generally similar, though often larger than the actual self-reported SCF values. We note here that there are numerous reasons why these Compustat multiples may over-predict, especially if the mix of small and large firms in the SCF is not comparable to the firms in Compustat. Most of the small firms in Compustat have negative income, for example, but these are firms that may want to realize losses in the quest for growth—the SCF firms of a similar size or industry may face different incentives or priorities.

Second, the predicted business values are more responsive to the business cycle than the self-reported values around the Great Recession period: each has a greater percent decline from 2007-2010 relative to self-reported values, and each has a greater increase from 2010-2013. These predictions may be overly pessimistic, especially if self-reported values are better at incorporating the *future stream* of payments or discounting the current low-income realization of the business. The predicted values rely on the current measures of annual income, which may incorporate temporary distress.

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[16] For example, income paid out as labor is subject to the payroll tax, while profits are not. In recent years, preferential tax treatment of pass-through income—in the form of lower rates—has been codified into tax law.
[17] In contrast to Appendix figure 2, this figure uses only actively managed businesses (which have both industry, income and sales information to predict with)

Figure 2: Private business values, SCF reported and predicted from SCF income and sales
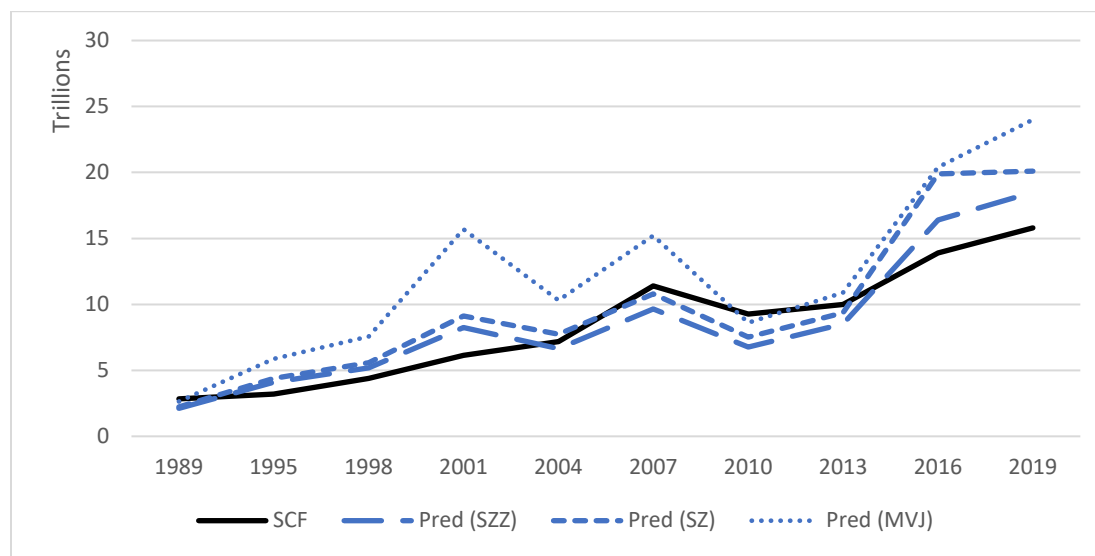
Note: author's calculations from Survey of Consumer Finances and data from *CRSP* ©2020 Center for Research in Security Prices (CRSP), The University of Chicago Booth School of Business. Orange line are SCF aggregates (for active businesses with industry codes only). Dark blue lines are predicted from equation, dashed blue lines take only part of business profits in calculation.

5. Overall rates of return

Aggregate rate of return

After establishing that SCF income aligns to available external data and that SCF private business values are governed by fundamentals, we compare the aggregate rate of return for private and public firms (figure 3, panel B).

This exercise is based on MVJ02 and Kartashova (2014), but we augment their analyses in two ways. First, we separate capital income from labor income in pass-through business income with two additional approached (as described in SZ20 and SZZ21). Second, we calculate aggregate returns separately for income yields and capital gains and sum these two pieces together, a method suggested in BBMS20.[18] The aggregate income yield (income divided by market value) and aggregate capital gains (change in market value between SCF years) are described by the following equations:

$$(1) \ R_t^{inc} = \sum_i {inc_{i,t}}\big/{value_{i,t}}$$

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[18] BBMS20 note that the original Moskowitz and Vissing-Jorgenson (2002) and Kartashova (2014) update may conflate two things—an annual income yield and an annualized three-year capital gains return—that are not quite comparable to the annualized Compustat value-weighted return.

$$(2)\ R_{t+3}^{cg} = \left(\frac{\sum_i value_{i,t+3}}{\sum_i value_{i,t}}\right)^{1/3} - 1$$

We construct both the income yield and capital gains in the SCF and in the Compustat data. Though Compustat reports annual yields and returns, the SCF is triennial; to be comparable, we construct geometric averages of three-year capital gains in both SCF and Compustat. We also apply the three labor adjustments—described in the previous section—when calculating pass-through income yields to be comparable to corporate income reported in Compustat.

Table 1 shows that labor-adjusted income yields in the SCF are comparable to income yields in the Compustat data (columns 2-4 versus column 5). Comparable capital gains yields (columns 6 and 8) have some noticeable differences: during the stock boom period in late 90s, the public returns outpace private returns.

Putting the two together—as recommended by BBMS20—public returns generally outpaced private returns overall in the 1990s, while private returns outpaced public ones from 2001-2010 (figure 3). Qualitatively, these results are similar to those from MVJ02 and Kartashova (2014) despite the different method of constructing aggregate returns.[19]

In the years since the Financial Crisis (2013-2019), returns on public firms have tended to outpace the returns to private firms, albeit weakly (Figure 3). Returns on public firms outpace private firms around 2013 and 2019 and are about the same as public firms in the 2013-2016 period.

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[19] Appendix figure 5 replicates the MVJ02 and Kartashova (2014) returns using their original method.

Table 1. Estimated income yields and capital gains, SCF and Compustat

	(1) SCF	(2) SCF	(3) SCF	(4) SCF	(5) Compustat		(6) SCF	(7) Compu	(8) Compu
		Remove labor share of private business income							
SCF yr.	All	MVJ	SZ	SZZ	PI		KG (t-3)	KG (t-1)	KG (t-3)
1989	22.6	8.2	5.2	4.1	12.3		---	---	---
1992	25.8	14.2	6.3	5.3	6.6		0.9	27.2	13.2
1995	26.0	17.2	7.5	5.9	8.9		4.0	-1.1	7.9
1998	23.4	14.5	6.6	5.1	6.3		10.5	31.8	28.8
2001	23.0	16.4	6.9	5.4	5.3		12.5	4.3	15.6
2004	19.4	12.1	6.8	4.4	7.0		6.5	28.7	-4.8
2007	19.4	13.8	6.6	4.5	9.0		14.8	12.7	9.1
2010	15.1	8.4	5.2	3.6	6.0		-6.2	21.4	-8.6
2013	17.0	9.5	5.3	3.5	8.7		4.3	13.8	9.4
2016	16.2	7.0	6.7	3.7	5.5		11.8	-2.5	10.8
2019	13.8	8.7	4.5	3.1	6.9		3.4	-4.5	6.8

Note: author's calculations from SCF and CRSP data (©2020 Center for Research in Security Prices (CRSP), The University of Chicago Booth School of Business). Table 1 is similar to Appendix Table A.12 in BBMS20 but includes labor-adjusted version of SCF income yields (columns 2-4). Column 1 shows the income yield on private SCF businesses before removing labor share of business income. Column 2 removes the labor component of private business income as in MVJ02, column 3 removes the labor component of private business income as in SZ20, and column 4 the labor component of private business income as in SZZ21. Income yields in each of columns 1-5 are based on equation 1. Column 5 shows the income yield on public firms in the CRSP/Compustat data, using the pre-tax income concept ("PI"). Column 6 estimates aggregate capital gains returns (realized or unrealized) between the SCF survey years (as in equation 2). Column 8 shows the equivalent calculation from Compustat (as in equation 2 and BBMS20), and column 7 shows the calculation using annual changes (available only in Compustat).

Figure 3. Aggregate overall business return: SCF private, Compustat public business
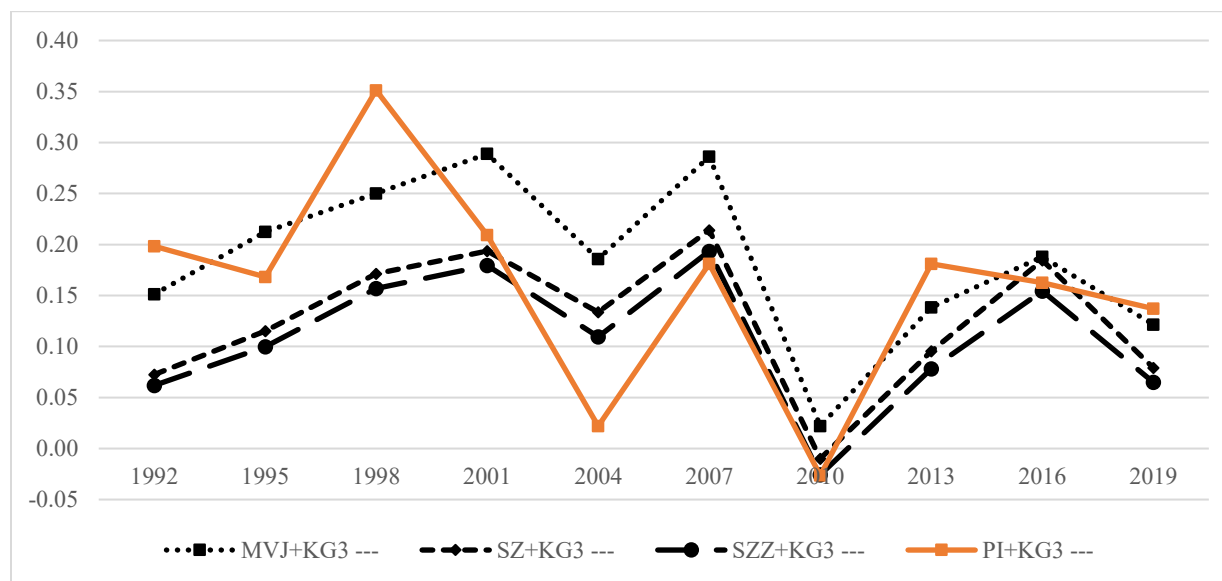
Note: author's calculations from SCF and CRSP data (©2020 Center for Research in Security Prices (CRSP), The University of Chicago Booth School of Business). Figure 3 plots overall rates of return for SCF private business and Compustat as advised by BBMS20. Orange line is the sum of Compustat income yield and annualized 3-year capital gains (Table 1, columns 5 and 8, respectively). Black lines add labor-adjusted SCF business income yields to SCF annualized capital gains (Table 1 columns 2, 3, or 4, and column 6).

6. Conclusion

Measuring the value and income of private businesses is challenging due to the private nature of these firms. In this paper, we evaluate owner-reported values and income of privately-held businesses from the Survey of Consumer Finances (SCF), describe trends in private business equity, and provide estimates of rates of return on private business equity. Though some researchers are skeptical of survey data on private business wealth and income, we show that the business income and business valuations in the SCF align closely to external aggregates once concepts have been appropriately defined. In addition, we show that the sales-to-value and income-to-value ratios of SCF private businesses also align well with publicly-traded firms.

We also extend the work of MVJ02 and Kartashova (2014) comparing aggregate returns of private vs. public equity in the years since the Financial Crisis. Even with adjustments suggested by BBMS (2020), we find qualitatively similar results to the earlier analysis, and show a slight favoring of public over private equity returns from 2010 to 2019.

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Appendix Figure 1. Aggregate business income: SCF income section and INSOLE personal income tax filings
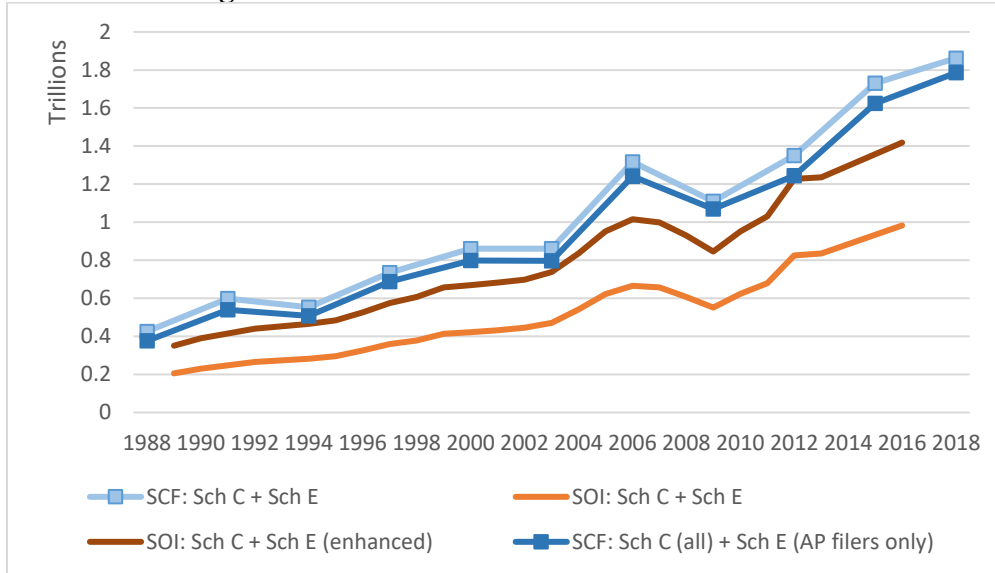
Note: author's calculations from Survey of Consumer Finances and Statistics of Income Individual and Sole Proprietor INSOLE data. Light blue line plots aggregate income from SCF income section (Section T), dark blue line adjusts and retains only schedule C and E filers in the SCF. Light orange line is aggregate Schedule C and E income (ordinary business income) form individual tax filings. Dark orange line adjusts these aggregates from underreporting (of 50% as in NIPA, and 18% underreporting from GAO, 2015).

Appendix Figure 2: Aggregate Noncorporate Business Wealth, Financial Accounts and Survey of Consumer Finances
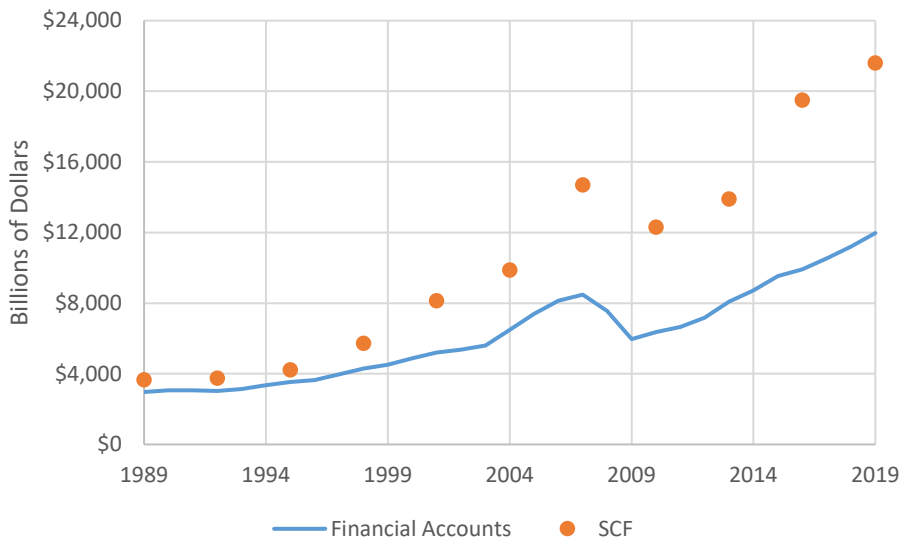
Comparison of Business Values the SCF and CRSP/Compustat

Appendix figure 3 shows the aggregate market value of firms in CRSP/Compustat and aggregate market value of SCF private businesses. Because of the unsurprising difference in levels for aggregate public equity and aggregate private equity—$40 trillion and $21.6 trillion, respectively, in 2019, the two series are plotted on different y-axes. The figure makes clear that the public and private equity have grown in tandem since 1989, and both show similar procyclical patterns during this time.

This comparison shows us that the SCF valuations grow with the overall macro environment. Since macroeconomic effects can vary across industry sectors, we also compare aggregate values by industry across time in Appendix figure 4. Again, we plot aggregates on different axes, which removes the level differences but allows us to see growth over time. In each industry, the aggregate valuations of SCF private businesses—as valued by their owners— follow the time trend of publicly-traded firms.

Appendix Figure 3: Aggregate market value of private and public firms 1989-2019
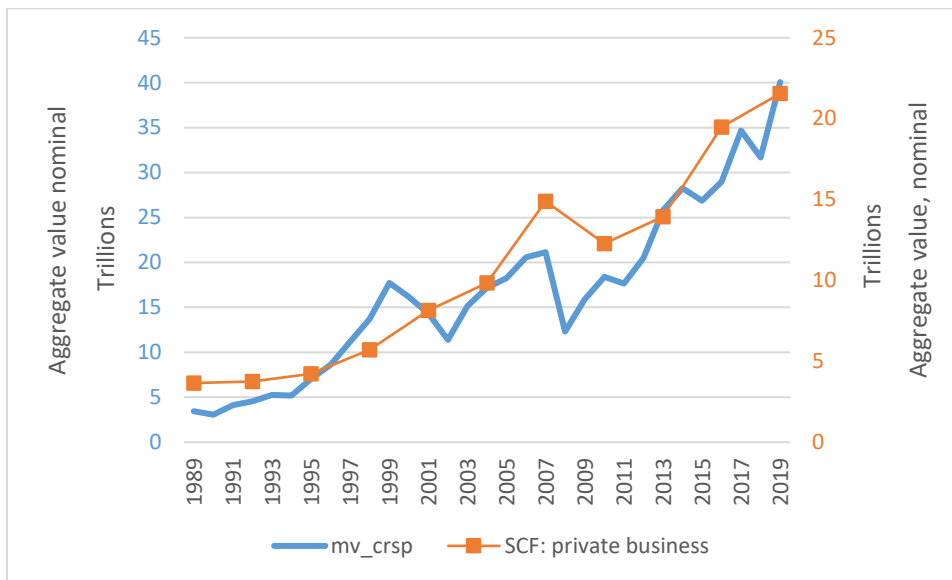
Note: Calculated (or derived) based on data from *CRSP* ©2020 Center for Research in Security Prices (CRSP), The University of Chicago Booth School of Business, and Survey of Consumer Finances.

Appendix Figure 4: Aggregate firm values, by industry
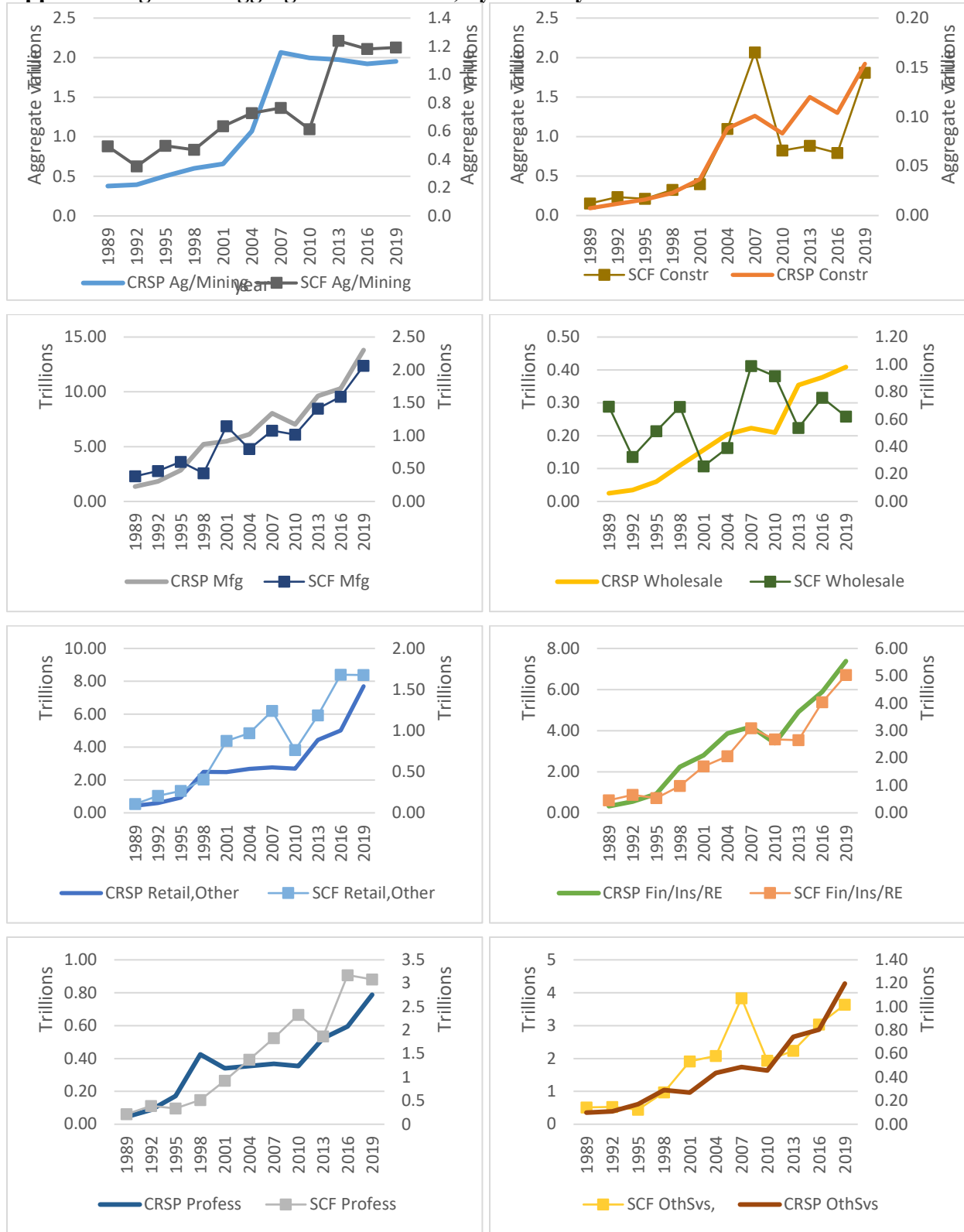
Note: Calculated (or Derived) based on data from *CRSP* ©2020 Center for Research in Security Prices (CRSP), The University of Chicago Booth School of Business, and Survey of Consumer Finances.

Comparison to MVJ02 and Kartashova (2014)

As noted in these earlier papers, the aggregate SCF private firm values include data on initial public offerings (IPOs) and mergers and acquisitions (M&A), and both income and values exclude new firm births.[20] Rates of return on private firms are estimated using the geometric average of returns in two periods:

$$r = \sqrt{R_1 \cdot R_2} - 1, \text{where}$$

$$R_1 = \left[\frac{mv_t + 3 * inc_{t-1}}{mv_{t-1}}\right]^{1/3}, R_2 = \left[\frac{mv_t + 3 * inc_t}{mv_{t-1}}\right]^{1/3},$$

where *mv* is the aggregate market value of private firms (after IPO and M&A adjustments), *inc* is aggregate income (adjusted for taxes, retained earnings, and labor share), *t* is survey year and *t-1* is year of prior survey (three years prior).

The qualitative results from the earlier papers are still evident: compared to the return on public firms in the CRSP data (the red line), the return on private firms is generally smaller prior to 2001, and larger between 2001 and 2010. In the post-Financial Crisis era (since 2010), the return to public and private firms are about equal (figure 4a). Returns on public firms outpace private firms in the 2010-2013 and 2016-2019 periods, returns on private firms outpace public firms in the 2013-2016 period.

Looking across the entire SCF time series, the results when using more recent labor adjustments proposed in SZ20 and SYZZ21 are qualitatively similar to those with the MVJ02 labor adjustment: public returns outpace private from 1989 to 2001, while private returns outpace public returns from 2004 to 2010 (figure 4a, dashed blue lines).

As shown in panel B of figure 4, aggregate rates of returns for private corporate businesses are generally comparable to returns on non-corporate businesses. Private corporate firms include both S and C Corporations, and non-corporate firms include partnerships, sole proprietors, and LLCs.

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[20] Data on IPOs are from Jay Ritter (https://site.warrington.ufl.edu/ritter/ipo-data/) and data from M&A is from Refinitiv (formerly Thomson SDC).

Appendix Figure 5: Aggregate Private and Public Firm Rates of Return: 1989-2019
Panel A. Private firms, by labor adjustment, and public firms
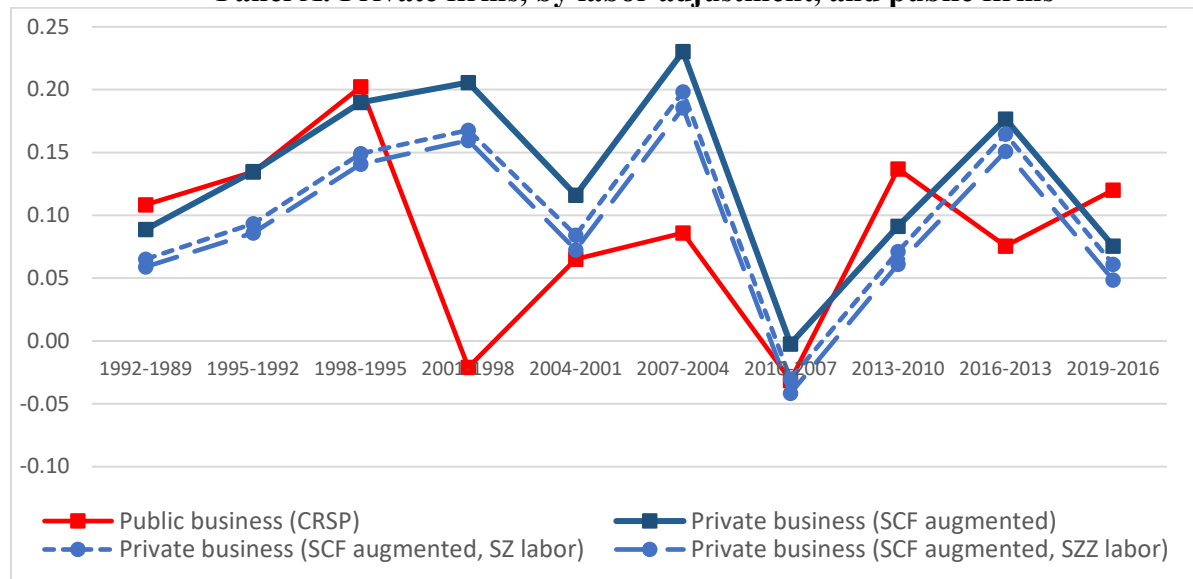
Panel B. Private firms, by legal organization
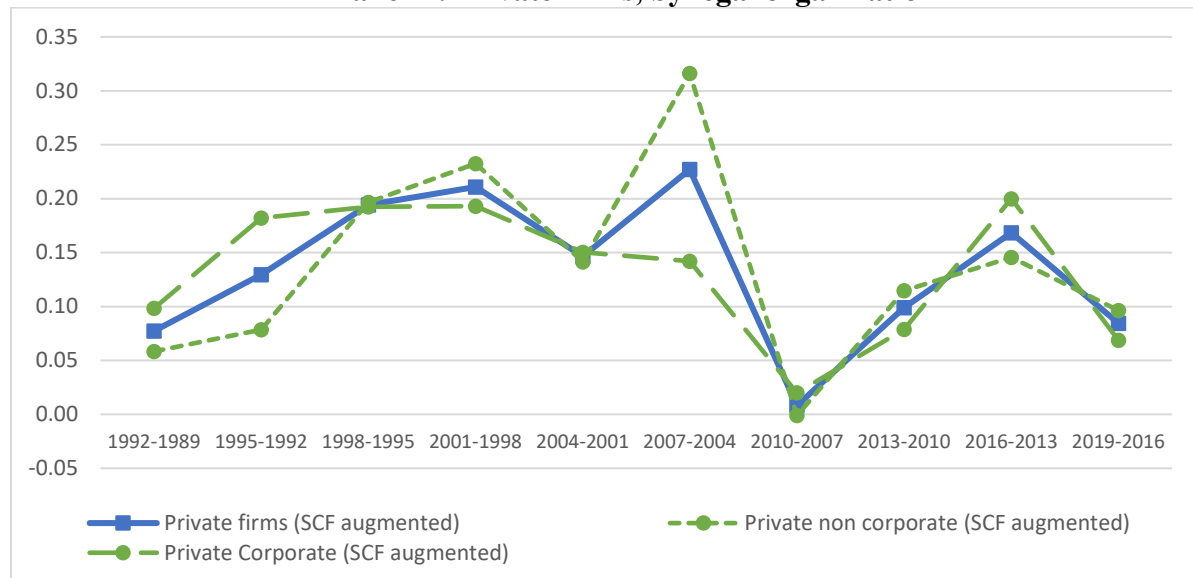
Note: author's calculations from SCF and CRSP data (©2020 Center for Research in Security Prices (CRSP), The University of Chicago Booth School of Business). Panel A includes the baseline labor adjustment for wages only (as in MVJ02 in solid blue line) and alternate labor adjustments as in SZ20 and SZZ20. 'SCF augmented' refers to the use of SCF aggregate market values augmented with external data on IPOs and M&A. In panel B, non-corporate organizational forms include partnerships, sole proprietorships, and LLCs; corporate organizational forms include both C and S Corporations. Panel B wage adjustment accounts for wage labor only (as in MVJ02).