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ABSTRACT

We consider the short-run responses of businesses and their owners to the introduction of Section 199A, a deduction implemented in 2018 that reduced the effective tax rate on pass-through business income. We study the deduction using several datasets derived from de-identified tax records of individuals and businesses. Overall, we do not find an increase in 2018 in business income likely to be eligible for the deduction, either in the time series or among firms with greater exposure to the deduction due to plausibly exogenous characteristics. We additionally examine specific hypothesized margins of adjustment. We find that partnerships (one type of pass-through business) reduce compensation paid to owners, in line with the incentives created by 199A, but that S corporations (another type of pass-through business) mostly do not. Additionally, we do not find that workers – whether new hires or current employees – switch from employee to contractor status to claim the new deduction. Finally, we find no evidence of changes in real economic activity as measured by physical investment, wages to non-owners, or employment of nonowners, though this analysis is underpowered in the short-run.

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In 2018, over 17 million individual taxpayers benefited from a new deduction on pass-through business income created by the Tax Cuts and Jobs Act (TCJA).[1] The provision generally allows individual taxpayers to claim a deduction of 20 percent of Qualified Business Income (QBI), a category that includes most business income earned by pass-through entities. As a result, pass-through business owners and the self-employed now typically face lower effective tax rates than wage earners, creating a number of incentives to increase eligible business income. In this paper, we estimate individual and business level behavioral responses to the 199A deduction using administrative tax data for tax year 2018.[2] We analyze the total effect of the deduction on pass-through income as well as specific margins across which taxpayers can potentially convert non-qualifying income into QBI.

With some notable exceptions, we do not find evidence of large responses to the 199A deduction in 2018. This contrasts with critical predictions made by some commentators that section 199A would prompt a wave of tax avoidance, encouraging workers to move from employee to contractor status and causing business owners to shift income and perhaps restructure businesses to obtain a greater deduction.[3] It also stands somewhat in contrast with optimistic predictions that the business tax cut would encourage economic activity, although it is too early to observe any long-run effects (Hassett and Hubbard, 2002; Barro and Furman, 2018). Both the optimistic and pessimistic predictions were plausible a priori given the magnitude of the tax cut implicit in section 199A: the deduction effectively reduces marginal tax rates on QBI by between two to seven percentage points, with larger cuts for higher-income taxpayers. However, at least in the first year of data available, the observed effects on taxpayers' behavior have been modest.

We test for behavioral responses along a number of margins, using data on both the pass-through entity and the individual owner. First, we look for increases in income of a sort that would be potentially eligible for the deduction if other requirements are met; we term this income "potential QBI."[4] Similarly, we examine shifts in the overall composition of income earned by individual pass-through owners. To identify this effect, we use two difference-in-differences research designs based on statutory limitations that restrict 199A eligibility. Specifically, taxpayers with taxable income above a phase-out range (for married couples in 2018 this range starts at $315,000 and ends at $415,000) do not qualify for the deduction to the extent that their business income is derived from a specified service trade or business (SSTB; e.g., medical or legal services).[5] This limitation allows us to construct two comparisons of taxpayers who are eligible vs. ineligible for the deduction (based on prior year characteristics): SSTB owners below vs. above the thresholds, and owners above the threshold who have non-SSTB vs. SSTB income. We caution, though, that we do not observe SSTB status directly; we infer it from taxpayer-reported NAICS codes. This measurement error biases our results towards null effects.[6]

We estimate that exposure to 199A leads to virtually no change in the share of the owners' income that comes from potential QBI, among those who earned some potential QBI in recent years. Our most

[1] See Table 3 for more detail on the distribution of the deduction.

[2] We plan to extend our analysis to 2019 outcomes once the data are reasonably complete. 2019 data remain substantially, and non-randomly, incomplete due to COVID-19-related filing and processing delays.

[3] See for example Duke (2018), Kamin et al. (2019), and Kleinbard (2019).

[4] Potential QBI differs from pass-through income in that it excludes certain types of income from interest, dividends, and other investment income, as well as guaranteed payments paid by partnerships to partners.

[5] For taxpayers above the thresholds with income derived from non-SSTBs, the deduction may also be limited. It cannot exceed the greater of 50% of the owners share of W-2 wages paid or the sum of 25% of wages paid plus 2.5% of the owners basis of qualified property. In our main regressions we ignore this complication and deem non-SSTB income eligible. Later, we explore the specific incentives generated by this limitation.

[6] A calibration exercise looking at take-up rates of the section 199A deduction for taxpayers classified by our measure of SSTB status indicates that our measure is useful but imperfect. See Appendix A for details.

credible estimates come from difference-in-difference regression specifications that compare SSTB-owners above and below the section 199A income thresholds. We can rule out an increase in the ratio of potential QBI to adjusted gross income (AGI) in excess of 0.4 percentage points, relative to a baseline mean of 38 percent. We additionally find no effect (or, if anything, small wrong-signed effects) of section 199A exposure on the overall amount of potential QBI, both in levels and transformed using the inverse hyperbolic sine transformation (Pence, 2006). We show that these null results are robust to modifying our definition of potential QBI and to using inverse propensity weighting to address underlying differences between treatment and control groups.

Second, we test for changes in the way income is distributed to owners at the business entity level. Owners of partnerships and S corporations have some scope to shift the classification of income between the business profits of the firm and the labor compensation of its owners. Only the former may qualify for the section 199A deduction. For S corporations, some owner compensation for labor services is legally required and is taxed as wage income. For partners, receiving guaranteed payments for labor services is entirely optional.[7] Our analysis finds a null average treatment effect of Section 199A on the wages paid to shareholders of S corporations, both in the time series and by comparing those firms for whom shifting would be more or less constrained by coordination frictions. In contrast, we see clear time series evidence that guaranteed payments to partners fell in 2018. Additionally, we find that wages to shareholders increased among the small subset of S corporations for whom the limitations in section 199A created an incentive to *increase* wages. One explanation for these divergent results is that legal constraints may prevent S corporation owners from reducing wages; no such constraints apply to increasing wages or reducing guaranteed payments.

Next, we test whether 199A encourages contract work relative to wage employment using a sample of individual workers. When the TCJA passed, there was concern that firms and workers would classify existing or new workers as contractors rather than employees because contractor income would generally be eligible for the deduction while employee income would not. First, we look at the universe of workers each year who change status within the same firm, as measured by Employer Identification Number (EIN). We find no evidence that the aggregate number of worker transitions to contractor status has risen nor do we see an increase in the percentage of firms with workers becoming contractors. Second, we use a sample of individual filers to examine whether there has been an increase in the prevalence of contractor income either as a primary or secondary income source. The number of people with contractor income has been rising in previous years, but we see no evidence in the aggregate that transitions to contractor status have increased above the trend in 2018. When we use a difference in differences strategy to compare workers above and below the 199A deduction limitation income threshold, we see no evidence that those below the threshold were more likely to become contractors relative to those above the threshold. We also find no evidence that new 2018 contractors were more likely to claim the deduction than existing contractors or new 2017 contractors, which we would expect if many of them became contractors to benefit from the deduction.

Finally, we test for several potential "real" responses to section 199A. In particular, section 199A could change the break-even rate of return for investment projects in existing firms, potentially leading to changes in employment and investment in tangible property. Additionally, the tax reduction caused by section 199A could be shared with workers in the form of higher wages as a bargaining model would predict (Risch, 2020). We use entity-level S corporation data to test for the effect of exposure

[7] Guaranteed payments are analogous to wages paid to S corporation owners because they are payments made regardless of the firm's profit; however, partners can also be compensated for labor services via their distributive share of profits.

to Section 199A on tangible investment, the number of non-shareholder employees, and the total non-shareholder wage bill. This analysis uses variation in SSTB status of the entity to measure exposure to the deduction. Our point estimates for each of these three margins are close to zero and statistically insignificant, though the confidence intervals cannot rule out meaningful effects, especially given the short-run nature of the evaluation period. Taken together, the results suggest it is unlikely that large increases in capital and labor investments occurred due to the deduction in the first year it was available.

Our analysis relates to several existing bodies of work. First, a small set of papers also study tax provisions that reduce the tax rate on pass-through business income relative to wage income. Prior to 199A, this literature focused on a tax reform in Kansas (which has since been reversed) that exempted some pass-through income from state income taxation (DeBacker et al., 2018, 2019; Goodman, 2018; McCloskey, 2018). These papers generally find small effects on real economic activity as well as shifting between various tax bases, with the exception that DeBacker et al. (2018) do find a large shift away from guaranteed payments to partners. Along with our previous paper (Goodman et al., 2019), which simulated the 199A deduction using 2016 data, we contribute to this literature by studying a nationwide, highly salient change in the tax wedge between business and wage income. Additionally, we contribute to an unresolved literature that assesses the potential ramifications of section 199A, arguing that the unintended consequences might be severe (Kamin et al., 2019) or not (Oei and Ring, 2020).[8]

Second, we expand the literature that uses tax data to describe the landscape of pass-through businesses in the United States. Two important such papers are Smith et al. (2019) and Cooper et al. (2016). The former explores the characteristics of high-income owners of pass-through businesses, concluding that most income of these owners reflects returns to human capital. The latter traces through the complicated ownership structures of partnerships and finds that partnership income faces a relatively low tax rate. We contribute to this literature by documenting some of the ways that the TCJA has and has not altered the organization of pass-through business activity.

More broadly, we add to studies of tax avoidance in the form of shifting income across tax bases. This literature goes at least as far back as Slemrod (1992), which proposed a hierarchy of tax response into (1) timing responses, (2) avoidance responses, including across tax bases, and (3) real responses. Interested readers are directed to the thorough reviews of this literature in Slemrod and Yitzhaki (2002), and Saez, Slemrod and Giertz (2012). Indeed, the growth of pass-through entities itself is arguably an example of such a response: the share of business income earned by pass-through entities increased substantially after the Tax Reform Act of 1986 made the pass-through form more tax favorable than the C corporate form in many circumstances (Saez, 2004). Our study examines newly created channels for tax avoidance, finding substantial shifting along some margins but not others.

In sum, our paper provides evidence that a large policy change, which altered and created incentives to shift income across a variety of margins, generally did not result in large behavioral responses among business owners in 2018. In particular, we find null or small effects on behavioral margins that are somewhat difficult to change, such as changing worker classification, which introduces potential legal liability for the employer and changes many features of the job in addition to the tax consequences. In contrast, we find a few significant responses across margins that are easier to adjust, such as partnership guaranteed payments for services. We note that reducing these payments has material economic effects, as shifting the partner's compensation to shares of profits results in a riskier income

[8]There also exists a small literature studying the response of C corporations to the TCJA, including Dowd, Giosa and Willingham (2020) and Avi-Yonah (2018), among others.

stream. Nonetheless, this is a margin with fewer adjustment frictions. Further analysis will shed light on whether responses along some of the margins with greater frictions increase in 2019 after more time has passed for owners to respond to the new tax incentives.

I Institutional Background

In this section, we provide a brief overview of business taxation to motivate our empirical approach and offer background on the incentives created by the Section 199A deduction, which applies only to pass-through business income earned by individual owners.[9] Businesses can be divided into two categories based on their taxation: C corporations and pass-through businesses. Virtually all of the largest businesses in the United States are taxed as C corporations, which face an entity-level tax on profits and whose shareholders in general pay tax on dividends and capital gains. However, most small and medium (and some large) businesses are organized as "pass-through" entities, which generally do not pay tax at the entity level. Instead, their income "passes through" the business and is taxed as income to the owner. If the owner is an individual, then the income faces individual tax rates, with items like long-term capital gains retaining their character and therefore facing lower tax rates than items like ordinary business income, which faces ordinary income tax rates. Pass-through entities are characterized as sole proprietorships, S corporations, or partnerships for tax purposes. Limited liability companies (LLCs) as a default are taxed as sole proprietorships if they are single-member, and as partnerships if they are multi-member; however, either form of LLC may elect to be taxed as an S corporation (or as a C corporation, foregoing pass-through status).

In addition to the issue of whether the business pays an entity-level tax, another key feature of the pass-through tax regime regards the timing of income. Owners of C corporations pay individual taxes only when dividends are distributed, while pass-through income is taxed in the year that it is earned regardless of when the income is distributed to owners. C corporations can generally retain earnings indefinitely, delaying the individual-level tax on dividends as long as desired. Determining whether effective tax rates are lower for C corporation or pass-through owners depends on a number of factors including the corporate tax rate, individual ordinary income tax rates, the dividend tax rate, the business's net profits, and the extent to which the business retains earnings. Despite this complexity, the overall trend is clear: since the Tax Reform Act of 1986, the share of business activity occurring in pass-through entities has been steadily increasing (Smith et al., 2019; Saez, 2004). Today around half of business income in the United States is earned through pass-through businesses (Cooper et al., 2016) and in 2018 we estimate that 37.5 million individual tax units reported positive pass-through income on their tax return.

The taxation of pass-through owners' compensation for their labor varies depending on the entity type. Owners of sole proprietorships generally do not pay themselves wages; instead ordinary income from sole proprietorships faces ordinary income tax rates as well as self-employment taxes, which mimic the payroll taxes that would be applied to wage income. In contrast, active owners of S corporations are required to receive wages meeting reasonable compensation criteria. This income is deductible to the S corporation and for the owner is treated as any other wage income and therefore faces payroll tax. The remainder of S corporation income for these owners is not subject to payroll or self-employment taxes, creating a tax incentive to receive S corporation income as profits rather than reasonable compensation. Bull and Burnham (2008) estimate that S corporation owners disguise

[9] Portions of this section are reproduced verbatim from our working paper, Goodman et al. (2019).

35 percent of their labor income as profits. Individual partners face something of a hybrid of the tax treatments of sole proprietors and S corporation shareholders. Like sole proprietors they do not receive wage income, nor are they subject to reasonable compensation rules and the ordinary income they receive is generally subject to self-employment taxes. An important exception to this rule is that traditional "limited partners" (that is, a partner in a general partnership who has limited liability for the partnership's debt) are not subject to self-employment taxes on their ordinary business income. Thus their income is taxed like S corporation profits.

In December 2017, the bill originally titled the "Tax Cuts and Jobs Act" was signed into law. Among its many provisions is the introduction of Section 199A, which creates a deduction for pass-through owners, effective for tax years 2018 through 2025.[10] Though the rules governing this deduction are complex, at its core it allows individuals to deduct up to twenty percent of their pass-through business income from taxable income. This change reduces effective average and marginal tax rates on pass-through business income relative to other forms of ordinary income such as wages.

Only income that is considered qualified business income (QBI) is eligible for the section 199A deduction. QBI from pass-throughs generally includes ordinary business income, rents and royalties, and interest income properly allocable to the business. As previously mentioned, income from a pass-through business generally retains its character when passed to an owner, so while capital gains and qualified dividends from a pass-through business are not considered QBI, they remain eligible for the lower capital gains rates. Any wages paid to active S corporation owners or guaranteed payments paid to partners are also not considered QBI.

There are a number of provisions that limit income eligibility for the 199A deduction. As we show in Goodman et al. (2019) these limitations could have a large effect on the distribution of the deduction benefits in the absence of behavioral responses. Individuals with taxable income above the top of a phase-in range (in 2018, $415,000 for married couples and $207,500 for other taxpayers) are subject to two guardrails.[11] The first is that income derived from a specified service trade or business (SSTB) is not considered QBI and therefore is ineligible for the deduction.[12] The second is that, for taxpayers above the top of the phase-in range, any portion of the deduction derived from a non-SSTB is reduced (potentially to zero) if the business does not pay a sufficient amount of wages to employees or own a sufficient amount of tangible capital. Specifically, the amount of the deduction derived from a non-SSTB cannot exceed the greater of: half of the owner's share of W-2 wages, or the sum of 25 percent of the owner's share of W-2 wages plus 2.5 percent of the owner's share of the tangible capital of the firm.[13]

For all taxpayers, the section 199A deduction can only offset ordinary taxable income, not long-term capital gains or qualified dividends. In particular, the deduction cannot exceed 20 percent of

[10] Section 199A replaces former Section 199, which provided the Domestic Production Activities Deduction. Section 199A also allows a deduction for qualified Real Estate Investment Trust dividends, qualified publicly traded partnership income, and certain income from co-operatives. In addition, Section 199A allows trusts to benefit from the general pass-through deduction. We do not study these aspects of the law.

[11] In 2018, these limitations are phased in from $315,000 to $415,000 in income for joint filers and $157,500 to $207,500 for other filers. For taxpayers with incomes in the phase-in region, only a fraction of the limitations apply while for taxpayers with incomes above the end of the phase-in region the limitations are in full effect. The threshold values are indexed for inflation.

[12] To be clear, for taxpayers below the phase-in thresholds, SSTBs can generate QBI. Therefore we include SSTB income in our definition of "potential QBI".

[13] "Owner's share of wages" refers to the taxpayer's share of the business owned (for purposes of the wage deduction) multiplied by the total W-2 wage bill paid to all employees. "Owner's share of tangible capital" refers essentially to the owner's share of the business owned (for purposes of depreciation deductions) multiplied by the total cost of depreciable property that was placed in service within the past 10 years (or longer for longer-lived assets such as structures). The total wage bill includes the wages paid to S corporation shareholders, but does not include guaranteed payments paid to partners.

ordinary taxable income, meaning that taxpayers with little or no ordinary taxable income may not receive much tax savings from the 199A deduction.[14] In addition, owners of multiple businesses must offset positive QBI with any negative QBI, potentially reducing the deduction. If the net quantity of QBI is negative, it must be carried forward, reducing the section 199A deduction in future years when QBI is positive.[15]

II Data

Our analyses use four different representative samples of U.S. taxpayers and businesses as well as a complete sample of workers who changed their worker classification. We need multiple datasets to study the distribution of 199A benefits and to examine responses at the pass-through entity level, the owner level, and among individual workers. In each dataset, all dollar-denominated variables are adjusted for inflation to 2018 levels. Each sample is drawn from the near-universe of administrative records of tax returns and information returns. The individual samples are summarized in Table 1 and the S corporation sample is summarized in Table C1.

II.A Pass-through Owner Sample

Our first sample is intended to capture individuals who are ex-ante likely to be impacted by changes in the tax rate on pass-through income. We use this sample to examine how pass-through owners' earnings respond to 199A. First we draw a stratified random sample of all individuals who appear as a primary filer of a Form 1040 reporting nonzero pass-through income – i.e. income reported on Schedules C, E, or F – in any year between 2008 to 2017. In order to maximize power given the nature of the quasi-experimental variation, we oversample taxpayers with high-income.[16] In all specifications, we use sample weights to ensure the population is representative of the population of those who earned pass-through income at some point between 2008-2017. We compile information from individuals' tax returns and information returns for tax years 2008 through 2018 during which these individuals are between the ages 18 and 90.[17] We refer to the resulting panel dataset as the "Pass-through Owner Sample".

The information on businesses owned by individuals in our sample come from Form 1040 Schedules C, E, and F, as well as the tax returns and Schedule K-1s of partnerships and S corporations. From Schedule C (for sole proprietors), we gather total gross receipts, income before expenses, wages paid, and expenses summed across all sole proprietorships for that taxpayer. We also retain the same variables at the business level for each of the taxpayer's two largest sole proprietorships (measured by the absolute value of income), along with the reported NAICS codes for the business. We then conduct the same exercise for Schedule K-1s from partnerships and S corporations; we gather totals across the two different entity types as well as business-level data (including ownership shares) for the two largest Schedule K-1s, as measured by the absolute value of ordinary income. We use NAICS codes and

[14] This limitation is meaningful because 20 percent of QBI could in certain cases exceed 20 percent of ordinary taxable income due to tax deductions unrelated to the taxpayer's business, such as standard or itemized deductions.

[15] See Joint Committee on Taxation (2019) for a more detailed description of the 199A deduction, including examples of how it is calculated.

[16] In particular, the sampling rate is 0.2 if the individual ever had AGI in excess of $300,000 or below -$100,000. If the individual does not meet this condition, but ever had AGI in excess of $200,000 or less than $0, the sampling rate is 0.1. Otherwise the sampling rate is 0.005. For the purpose of this sampling regime, we multiply the AGI of non-married filers by two.

[17] We follow such individuals over time, regardless of whether they are primary filers, secondary filers, or nonfilers in other years. We exclude the year of death from our sample if applicable.

ownership shares from these K-1s, as well as the two highest-income Schedule Cs, to estimate 199A eligibility for high-income business owners subject to the 199A limitations.

Table 1 shows that the most common type of pass-through income is sole proprietorship income; about one third of observations have sole proprietorship income while only eleven percent have either S corporation or partnership income. For all types of pass-through business income, the variation across our sample is quite large due to the skewed nature of business income.

Half of our observations have our income construct "potential QBI". We define potential QBI as the sum of all net income reported on Schedules C and F, rental and royalty income reported on Schedule E, and ordinary business income reported on the individuals' Schedule K-1 information returns filed by partnerships and S corporations.[18] This income is considered "potential" QBI since qualification for the deduction may depend on (i) whether the activity rises to the level of a trade or business, (ii) whether the business is an SSTB, and (iii) whether the owner satisfies the wage and capital limitations, among other factors, as explained in the prior section. Potential QBI excludes guaranteed payments to partners, as this income is entirely ineligible for the 199A deduction.[19]

II.B 2018 Sample

Our second dataset is representative of all individual tax returns in 2018. We only use it in this subsection, providing information on Section 199A claiming to offer context for other results in the paper. We take a stratified random sample of tax returns, using sampling weights to ensure representativeness.[20] We refer to this as the "2018 Sample". It includes around 6 million observations.

As Table 1 shows, we estimate that 27 percent of individual tax units had potential QBI in 2018. Around half of these taxpayers claimed a Section 199A deduction. In Table 2, we show how these deductions were dispersed amongst the income distribution. We also estimate the value of the deductions using a crude calculation that only takes into account statutory brackets and rates, ignoring interactions with other deductions, tax credits, and the alternative minimum tax schedule.

In aggregate, we estimate that $151 billion in 199A deductions were claimed in 2018, providing taxpayers with $43 billion in reduced tax liability. Of the 40.7 million taxpayers who reported pass-through income, 42 percent (17.2 million) enjoyed tax savings by claiming a 199A deduction. For most of these taxpayers, the tax savings were quite small. The median savings provided by 199A, among those with positive savings, was about $200, while the mean was $2,300. These results reflect that pass-through business income is known to skew towards the top of the income distribution – even more so than other types of income such as wage income or corporate business income (Cooper et al., 2016).

Of the $43 billion in tax savings provided by Section 199A in 2018, we estimate that 86 percent ($37 billion) accrues to taxpayers in the top decile of AGI. This group receives 77 percent of pass-through business income (after excluding the negative AGI bin), and thus benefits disproportionately from 199A. To some extent, this result arises naturally under a progressive tax code, as deductions are more valuable in higher tax brackets. However, the 199A limitations for high-income taxpayers reduce

[18] For Schedule E rents and royalties, we observe gross income for each category but net income only for both categories combined. To compute net income separately for rents and royalties, we allocate all of the implied expenses associated with rental and royalty income to rents.

[19] In some specifications reported in Appendix B, we report results using an alternative measure of potential QBI that excludes Schedule E rental real estate income and royalties, which is less likely to rise to the level of trade or business.

[20] If AGI exceeds $500,000 or is below -$100,000, the sampling rate is 1. If the individual does not meet this condition, but AGI exceeds $300,000 or is below $0, the sampling rate is 0.5. If AGI is between $200,000 and $300,000, the sampling rate is 0.1. Otherwise, the sampling rate is 0.015.

the tax savings available to those in the top AGI decile. Absent these statutory limitations on eligibility for Section 199A, these high-income taxpayers would receive an even greater share of the tax savings.

Pass-through income and the benefits of 199A are skewed within the top decile, the top one percent, and even the top 0.1 percent. Taxpayers in the top one percent of AGI receive 50 percent of pass-through income but 58 percent of 199A tax savings ($25 billion). Thus the majority of pass-through income and 199A savings in the top decile actually accrue to the top one percent. Moreover, the top 0.1 percent highest-AGI taxpayers alone capture nearly one-third of total 199A tax savings ($13 billion). Within the top 0.1 percent (AGI exceeding $2.4 million), the skewness continues. The median non-zero tax savings from 199A for this group is $12,500, while the average is $129,100.

II.C Individual Tax Filer Sample

Our third dataset is a representative sample at the individual level, and it allows us to study worker transitions between employee and contractor status from year to year. In particular, it allows us to check whether individuals who have no previous pass-through experience (and therefore are omitted from the Pass-through Owner Sample) become independent contractors in 2018 in order to benefit from the 199A deduction. The sample is representative of all individuals between the ages of 25 and 65 who file a tax return as a primary or secondary filer (the "Individual Tax Filer Sample"). We start by drawing a one-percent random sample of all individuals from Social Security Administration records and create a panel of tax records from 2007 to 2018. Individuals are only included in the analysis sample in years when they file a Form 1040 (as a primary or secondary filer) and meet the age criteria. The sample includes nearly 38 million person-year observations.

We measure the individual's labor income as the sum of wages from Form W-2 and contractor earnings from non-employee compensation on Form 1099-MISC.[21] As shown in Table 1, around 53 percent of observations have labor income; 51 percent have W-2 earnings and 6 percent have Form 1099-MISC earnings. The average wage earnings are around $21,100 while the average contractor earnings are around $1,300. We do not use income reported on the Form 1099-K to measure contractor income because of inconsistent reporting over time, including substantial reporting changes between 2017 and 2018 (Handwerger, 2018; Collins et al., 2019).

II.D Reclassified Worker Sample

Our fourth dataset focuses on workers who change their form of compensation at the same firm in order to study individuals' transitions between employee and contractor status within the firm. In particular, we test for a break in the trend of employee-to-contractor reclassifications of worker-firm relationships in 2018 in response to 199A. The dataset includes the universe of workers who received non-employee compensation on a Form 1099-MISC in year t and also wages on a Form W-2 issued by the same employer (as proxied by EIN) in any of years $t-1$, t, or $t+1$.

The Reclassified Worker Sample covers 2007 through 2018 and has 32 million observations. Due to the sampling criteria, both wage earnings and contractor income are common. Seventy-eight percent of observations have wage earnings, and 58 percent have contractor income. Moreover, 36 percent of observations have both types of income.[22] Average wage and contractor earnings are around $34,000

[21] Contractor earnings are included only if they exceed 600 nominal dollars, which is the threshold for mandatory reporting. We exclude payments under the threshold to provide consistency in measuring contractor activity regardless of the issuing firm.

[22] This number is not reported in the table.

and $10,000, respectively.

II.E S Corporation Sample

Our fifth and final sample is a panel of S corporations from 2012 to 2018 (the "S Corporation Sample"). These data allow us to examine entity-level outcomes of S corporations, including wages paid to shareholders, wages paid to other employees, and investment. It is a stratified random sample of all S corporations that existed at some point between 2012 and 2017, oversampling firms with high-income owners.[23] In all specifications, we use sample weights to make the sample representative of the broader population of S corporations. To each firm-year observation, we attach information about the shareholders, including the fraction of shareholders who are above the 199A phaseout thresholds. Additionally, we use the firm's industry, indicated by reported NAICS code, to proxy for the firm's status as an SSTB. We also simulate whether the firm's high-income shareholders would have been bound by the wage limitation had section 199A been in effect that year.[24]

Appendix Table C1 reports summary statistics for this sample. Mean net income (in 2018 dollars) exceeds $115,000, while median net income is $11,000. Additionally, while mean wages to shareholders are in excess of $50,000, we find that only slightly more than half of S corporations pay a wage to at least one shareholder. The mean number of shareholders is 1.6, with 65 percent of firms having exactly one shareholder. Lastly, we find that one sixth of shareholders have income above the section 199A income thresholds.

III Empirical Strategy and Results

In this section we present our empirical analyses. We divide the analyses of the effect of 199A into three categories: (i) changes in broad measures of pass-through income, (ii) adjustments along specific behavioral margins, including owner compensation and contracting vs. wage employment, and (iii) early evidence on real economic outcomes, such as business investment.

III.A The Broad Effect of 199A on Pass-through Income

By decreasing effective tax rates on QBI, Section 199A created an incentive to earn or report more of this income. Using a number of different approaches, we test whether pass-through business owners responded to this incentive. First, we check for a break in the trend of pass-through income receipt in 2018. Figure 1 plots estimated counts of pass-through owners over time, normalized to one in 2017, using our Pass-through Owner Sample. The solid black series plots the number of owners with non-zero pass-through income, which exhibits a relatively constant trend from 2010 to 2018.[25] The remaining series in Figure 1 plot the count of owners with pass-through income exceeding $10,000, $100,000, or $1,000,000 (in 2018 dollars) respectively. These series tell a similar story: while there is year-to-year

[23] In particular, if the firm has an owner with AGI in excess of $750,000 (in 2018 dollars) or less than -$100,000 in some year between 2012 and 2017, the sampling rate is 1. Otherwise, if the firm has an owner with AGI in excess of $150,000 or below $0, the sampling rate is 0.5. The sampling rate is 0.1 for all other firms. For the purpose of this sampling regime, we multiply the AGI of non-married filers by two.

[24] In practice, the measure of capital observed in the data is quite different from the definition of capital relevant for the 199A calculation. Thus, for the analysis of S corporations, we consider only the wage limitation.

[25] For this purpose, we define pass-through income as "potential QBI" (labeled "QBI" in the figure) – that is, income that would have constituted QBI in 2018 had the other requirements of section 199A been met.

variation, there are no large trend breaks in 2018. Thus, at first glance, the time series fails to uncover evidence of a large response to section 199A.

While the time series evidence is the simplest way to display changes in pass-through income receipt, it cannot rule out the possibility of a confounding temporal effect. In the absence of section 199A, pass-through income might have fallen in 2018. Therefore, our main analysis uses a difference-in-differences regression framework to compare groups of taxpayers who are eligible for 199A to those who are not due to the limitations of 199A built into the statute. As discussed in section I, not all pass-through income constitutes QBI and qualifies for the 199A deduction. In particular, we focus on the limitation on income received from SSTBs that applies to taxpayers with taxable income above the 199A thresholds.

This limitation allows us to construct two sets of treatment and control groups. In one identification strategy, we compare SSTB owners predicted to be below the 199A income thresholds (treatment) to those above (control), based on prior-year income. Our classification of owners as SSTB owners or non-SSTB owners is similarly based on prior year characteristics and is described in detail in Appendix A. In a second identification strategy, we compare taxpayers with non-SSTB businesses (treatment) to taxpayers with SSTB businesses (control) among taxpayers predicted to be above the 199A income thresholds. This approach implicitly assumes that the non-SSTB businesses have sufficient wages and/or capital to make their income eligible for the deduction, and therefore are properly considered treated. To the extent this assumption is invalid, it biases the results of the second regression framework towards a null finding. In Appendix A we also show that while the wage and capital limitation may be binding for some owners, taxpayers above the threshold have relatively high rates of claiming for a select group of non-SSTB NAICS categories. In both identification strategies, we characterize taxpayers as above or below the income threshold using the beginning of the phase-in of the 199A limitations ($315,000 for married couples in 2018).

Our difference-in-differences regressions estimate how outcomes change for the treated versus untreated group after 199A is implemented in 2018. Our estimation equation is:

$$Y_{it} = \alpha_0 + \alpha_1 Treat_{it} + \sum_{\tau=2013}^{2016} \beta_\tau Treat_{it} + \beta_{2018} Treat_{it} + \tau_t + \gamma_i + \epsilon_{it}. \quad (1)$$

Here Y_{it} refers to an outcome for taxpayer i in year t (2013-2018). The indicator $Treat_{it}$ is a proxy for (hypothetical) 199A eligibility in year t; it equals one if and only if the taxpayer in year $t-1$ had either non-SSTB status or was below the 199A income threshold. By using prior-year characteristics, we avoid endogenous selection into eligibility in 2018. We control for year (τ_t) and individual (γ_i) fixed effects. The term α_1 captures the constant difference in outcomes between the treatment and control groups.[26] The coefficients β_τ capture year-specific differences, with 2017 as the omitted category. Our primary coefficient of interest is β_{2018}, which gives the difference in outcomes between the treatment and control group in 2018, after adjusting for the fixed effects. Standard errors are clustered at the individual level.

Under the assumption that, in the absence of 199A, there would be no difference between the average outcomes of the treatment and control groups in 2018 once we adjust for the fixed effects, then β_{2018} captures the average treatment effect of section 199A for our sample. This is the standard difference-in-difference identification assumption, often referred to as "parallel trends," in reference

[26]This term is not subsumed into the individual fixed effects because a given individual could switch SSTB status, or predicted income, during the sample period.

to the common time trend captured by the τ_t parameters. We note that while our controls include the average difference between the treatment and control groups across all years ($Treat_{it}$), as well as year and individual fixed effects, they do not include any time-varying taxpayer characteristics. To the extent such characteristics are correlated with the outcome variable and they exhibit non-parallel time trends between the treatment and control groups, our coefficients would be a biased estimate of the true treatment effect.[27]

We study three different measures of pass-through business income as outcomes. The first is the ratio of potential QBI to AGI. These regressions only include taxpayers with positive AGI, and the share of potential QBI is censored at zero and one. The second is potential QBI in levels, with non-zero values Winsorized at the 1 percent and 99 percent levels. The third is a noise-reducing transformation of potential QBI known as the inverse hyperbolic sine (IHS) (Pence, 2006). For potential QBI that is positive and not close to zero, the IHS is close to the natural logarithm (plus a constant).[28] Each outcome has advantages and disadvantages. Potential QBI in levels is most transparent, but this specification has the potential to be driven by the tails of the distribution, increasing variance. The IHS specification mitigates this problem in the tails, at the cost of the results being more difficult to interpret. The ratio of potential QBI to AGI is more precise, but will miss any effect on QBI for those for whom the entirety of their AGI comes from QBI in all years. Nevertheless, using all three of these measures together provides a comprehensive examination of changes to pass-through income.

Our first set of results compares SSTB owners above the income threshold with those below. Across all three measures of pass-through income, we find little evidence that taxpayers increased their business income in response to the section 199A deduction. In Figure 2, we plot the difference-in-differences coefficients (β) for each year for the three outcomes. In Panel A, we find a precisely estimated null effect of the deduction on the share of AGI that is potential QBI in 2018. The 95-percent confidence interval rules out an increase in excess of 0.4 percentage points relative to a baseline mean of 38 percent. The coefficients for prior years show reasonably parallel trends, with economically small coefficients in all years. This suggests that the treatment and control groups had similar trends in the QBI share of AGI prior to 2018 and that this continued in 2018. Next, in Panel B we show the estimated effect of Section 199A on potential QBI in levels. This specification suffers from modest pre-existing trends, in which QBI experiences faster growth in the treatment group (those below the income threshold) relative to the control group (those above the income threshold) of roughly $3,000 over the 2013-2018 period, relative to a baseline mean of $155,000. However, if anything, this trend reverses in 2018, which presents a descriptive pattern consistent with a null effect. Finally, in Panel C we present results for the inverse hyperbolic sine transformation of potential QBI. This specification uncovers a small but statistically significant negative (wrong-signed) effect: a reduction of potential QBI of about five percent.[29] Again the 2018 effect reverses the prior years' trend, consistent with a null effect of 199A. Taken together, the three panels of Figure 2 corroborate the inference from Figure 1 that section 199A did not increase business income in 2018.

Our second set of results focuses on the comparison between non-SSTB and SSTB business owners. The analysis includes only taxpayers who have taxable income above the income threshold. Non-SSTB owners are considered treated while SSTB owners are the control group. This specification suffers from

[27] In Appendix B, we show results under alternative specifications, including weighted regressions using time-varying taxpayer characteristics to construct treatment propensity scores.

[28] In particular, the inverse hyperbolic sine is $\ln\left(QBI + \sqrt{QBI^2 + 1}\right)$, where we scale QBI in thousands of dollars.

[29] For positive values of potential QBI that are not close to zero, the resulting coefficient estimates can be interpreted as a percentage effect.

substantial pre-existing trends; each outcome experiences faster growth in the treatment group relative to the control group. The difference in growth remains even after reweighting the populations based on observable traits to make them more similar (see Appendix B), suggesting that SSTB business income is growing more slowly than non-SSTB business income during this time period. In light of this, we stress that a traditional difference-in-differences estimate is unlikely to recover a causal effect in this setting. Nonetheless, these results present a descriptive pattern consistent with a null effect. In all panels, the effect in 2018 is either zero or a small reversal of the pre-existing trend, a wrong-signed effect, as section 199A is predicted to increase the amount of pass-through income.

Overall, we find no evidence that section 199A increased pass-through income in 2018. The time series evidence shows no measurable increase, while our difference-in-differences approach reveal either economically small, statistically insignificant, or wrong-signed results across a number of specifications.

III.B Specific margins of adjustment

While we do not find evidence that overall business income increased due to section 199A, there may be specific behavioral responses that our previous analyses cannot detect. In this section, we take a closer look at some of these behavioral margins. We begin with changes in compensation for owners of S corporations and partnerships in response to incentives to reclassify income. Next, we consider movement across the boundary between employee and independent contractor relationships. If large enough, the behavior we study here would potentially show up in our previous analyses. However, some of the incentives we consider only apply to a small fraction of pass-through business owners, making it unlikely that we would observe their effects in the broad levels of pass-through income.

III.B.1 Owner compensation

First, we analyze whether owners of partnerships and S corporations reduced their labor compensation (which is not eligible for 199A), creating a corresponding increase in the "profits" of the firm (which might be eligible for 199A). For S corporations, labor compensation takes the form of W-2 wages. In general, because wages are subject to FICA while the profits of S corporations are not, owners face a wedge (predating TCJA) in favor of profits.[30] In order to protect the FICA tax base, the IRS requires owners of S corporations to pay themselves "reasonable compensation" for their labor services, though there is no hard-and-fast rule that establishes whether compensation is reasonable. Section 199A increased the tax preference in favor of profits, strengthening the incentive for owners to reduce their wages.

To identify the effect of section 199A on wages paid to S corporation shareholders, we compare single-shareholder to multiple-shareholder firms. For a single-shareholder firm, the division between wages and profits is entirely meaningless but for tax – the total pre-tax income is unaffected. By contrast, in a multiple-shareholder firm in which at least one owner is not receiving a wage (in the pre-199A counterfactual), the division is potentially meaningful. If the wage recipient were to reduce his or her wages, the pre-tax income of each shareholder would change: each dollar of wage reduction increases the profits of the firm by one dollar, but increases the pre-tax allocation to the wage-recipients

[30] One exception is high-income owners of S corporations who qualify as "passive" under the rules of section 469, who are required to pay the 3.8 percent Net Investment Income Tax on S corporation profits, which would typically be the same as the 3.8 percent rate on wages for such individuals.

by less than one dollar. Thus, one would expect a larger response, all else equal, by single-shareholder firms.[31]

In Figure 4 we display the raw percentage change in wages paid to shareholders for both single shareholder and multiple shareholder firms from 2013 to 2018.[32] For each firm i, we calculate w_{it}, the wages paid to shareholders in year t. We measure the percentage change as the arc-change, also known as the Davis-Haltiwanger-Schuh (DHS) difference (Davis, Haltiwanger and Schuh, 1996), equal to $\frac{w_{it}-w_{i,t-1}}{0.5(w_{it}+w_{i,t-1})}$. This formulation has the advantage of being defined when one endpoint is zero. In the aggregate time series, we see no clear reduction in shareholder wages in 2018. Both single and multi-shareholder firms' wages move in parallel over the sample period and, if anything, single shareholder firms have a small increase in wages in 2018.

In Figure 5 we perform the comparison between single and multi-shareholder firms more formally in a difference-in-differences regression. Panel A shows the results from the simplest specification with year effects and year-by-treatment effects, where 2017 is the omitted category. There does not appear to be anything unusual about growth in wages for single shareholder firms in 2018 relative to the growth in multi-shareholder firms. The point estimates from the simple specification suggest that wages in single shareholder firms generally grew faster than wages in multi-shareholder over the sample period, although the differences are not statistically significant. In particular, the 2018 estimated treatment effect is statistically insignificant, wrong-signed, and economically small (less than one percent). Panels B, C, and D add additional fixed effects interacted with year. Panel B controls for industry-time fixed effects; Panel C controls for time fixed effects interacted with bins of (lagged) business income (defined as ordinary income plus wages to shareholders); and Panel D controls for the full interaction of industry, lagged business income bin, and year. Under any of these specifications, we can rule out a meaningfully different response in 2018 between single- and multi-shareholder firms. In particular, the income-by-time fixed effects of Panels C and D reduce the small, wrong-signed effect in 2018 even closer to zero.

Next, we study owner compensation in partnerships, which are not allowed to pay their partners W-2 wages. Instead, to the extent the partnership wishes to pay a partner a "salary" in exchange for services provided, this is referred to as a "guaranteed payment."[33] Guaranteed payments are (but for tax) economically identical to wages: a partner will be allocated her guaranteed payments (if any) plus her allocative share of the partnership income determined after subtracting guaranteed payments to all partners. However, unlike wages, guaranteed payments are reported on the partner's Schedule E within the broader category of partnership income.

To explore the effect of 199A on guaranteed payments to partners, we focus on time series evidence. We do so for two reasons. First, the effect is clear in the time series. Second, the baseline levels of guaranteed payments between SSTBs and non-SSTBs, and between those above and below the phaseout thresholds, are very different, complicating any difference-in-differences analysis. In Figure 6 we use the Pass-through Owner Sample to show the simple time series of the percentage change in guaranteed payments to partners, averaged across individuals.[34] This series is fairly stable with modest positive growth throughout the sample window, with a clear drop in excess of 20 percent in 2018. Thus

[31] We estimate that 44% of firms with more than one shareholder, with positive wages to at least one shareholder, also paid zero wages to at least one shareholder.

[32] In all specifications, we use sample weights such that the sample is representative of the population of S corporations.

[33] Less commonly, a partner can receive guaranteed payments in exchange for capital provided to the partnership; such guaranteed payments are also generally ineligible for 199A. In our data, both types of guaranteed payments are aggregated together. Therefore, any estimated effects on guaranteed payments will include effects on both components.

[34] As in the case of S corporation wages, we again use the arc change (also known as the DHS difference): $\frac{g_{it}g_{it-1}}{0.5(g_{it}+g_{i,t-1})}$, where g_{it} is the total guaranteed payments received by an individual i at year t.

it does appear that partnerships responded to 199A by reducing (or eliminating) guaranteed payments.

In Appendix Figure C1 we present this evidence in a slightly different way. Among individuals who were partners in a partnership in both $t-1$ and t, we compute the share who "start" making guaranteed payments (i.e., guaranteed payments are positive in t conditional on zero in $t-1$) and the share that "stop" (guaranteed payments are zero in t conditional on being positive in $t-1$). The left panel shows that the share stopping was relatively constant between 2006 and 2017, with some expected variation around the Great Recession, before a large, nearly ten percentage point increase in 2018. Thus there appears to have been a response along the extensive margin, with partnerships ceasing guaranteed payments to some partners. The right panel shows that the share starting has been relatively constant near 1.5 to 2 percent, with a small but noticeable spike in 2017, potentially reflecting anticipatory behavior.

Finally, we consider the response from a small subset of S corporations for whom 199A created an incentive to *increase* owners' wages. As described in Section I, taxpayers who are above the income threshold are still potentially eligible to use the 199A deduction subject to two restrictions: the business must not be an SSTB, and the deduction is limited by a function of wages (to shareholders or otherwise) and tangible capital. Specifically, the amount of the deduction cannot exceed the greater of (i) 50 percent of the owner's share of W-2 wages paid by the business to all employees, or (ii) 25% of wages plus 2.5 percent of the owner's share of tangible capital. For illustration, suppose a high-income taxpayer's only business earns profits of π before paying wages to shareholders (w), and further assume that the S corporation pays no wages to any other employee and does not have sufficient tangible capital. In that case, the deduction would equal the smaller of $0.2(\pi - w)$ (the net income of the firm) or $0.5w$. Whenever $w < \frac{2}{7}\pi$, the firm could increase its 199A deduction by increasing w.

To study whether firms with such an incentive do in fact increase their wages to shareholders, we refine our S corporation sample to include only single-shareholder firms in years when the wage limitation is relevant. Specifically, we restrict to those firms that (1) are non-SSTBs (determined based on $t-1$ reported NAICS code), (2) have only one shareholder (as of $t-1$), and (3) for which that shareholder was above the bottom of the 199A phase-out threshold in $t-1$. This severe set of restrictions drops 94 percent of S corporation observations. Within the remaining group, we define a firm-year observation to be "treated" if the wage limitation would have limited their deduction in $t-1$ by at least 50 percent.[35] Roughly 8% of observations in this subset are identified as "treated."

In Figure 7, we plot the time path of wage changes (again measured using the DHS difference) for businesses that are owned by taxpayers who are bound (solid line) versus not bound (dashed line) by the wage limitation. There is a large level shift between the two series. Those that are bound have at least a twenty percent increase in wages in every year, while those that aren't bound show small declines in wages paid every year. This pattern likely reflects mean reversion: those who are bound (not bound) in $t-1$ will tend to be those whose wages to shareholders are temporarily low (high) in $t-1$ and thus will tend to experience an increase (decrease) from $t-1$ to t. Importantly for our identification, however, these lines move mostly in parallel prior to 2018. That is, the mean reversion appears to be roughly constant over time. The figure shows that these series diverge to some extent in 2018, with those bound by the wage limitation increasing their wages *more* in 2018, as hypothesized, and with no such effect for the group that is not bound.

[35] Because we are not able to observe the proper capital measure, we consider only the component of the limitation that refers to 50 percent of wages. This will tend to cause us to misclassify certain firms as "bound" that are not actually bound, which will have the general effect of attenuating our estimates.

Figure 8 plots this in event study form in a manner analogous to Figure 8, including the same set of fixed effects in panels B, C, and D. All four panels yield qualitatively similar results: prior to 2017, businesses with and without an owner hypothetically bound by the wage limitation experience similar time trends in wages paid. In 2018, those with an owner bound by the limitation see a 10 percent increase in wages paid relative to businesses without an owner bound by the limitation, and the jump is statistically significant.

To summarize, we find no effect of 199A on wages to S corporation shareholders in general, while we do find fairly large effects in the expected direction for guaranteed payments to partnerships and wages to shareholders in the small subset of S corporations that faced an incentive to increase wages. One potential explanation for this discrepancy is that owners of S corporations may not reduce their wages because they are legally constrained by the reasonable compensation standard. By contrast, there is no legal constraint preventing owners of S corporations from increasing their wages or preventing owners of partnerships from reducing or eliminating guaranteed payments.

The behavioral responses we have uncovered in this section affect only a small subset of business owners and are consistent with our null results on the effect of 199A on business income overall. Around 8 percent of partners received guaranteed payments in 2017 and the total amount of guaranteed payments represented only 11 percent of individual partnership income. Moreover, only 0.5 percent of S corporations, accounting for 1.7 percent of S corporation income, faced an incentive to increase owner wages.

III.B.2 Employment vs. contracting

Finally, we examine whether the deduction affected transitions between employee and contractor status. Under section 199A, income received as an independent contractor is generally eligible for the deduction because it is taxed as business income, while wages earned by an employee are not eligible. At the time of the law's passage, many observers speculated that a substantial number of workers might transition from employees to contractors to decrease their tax liability. The new tax differential added a consideration to firms' and workers' decisions about how to structure employment arrangements. Prior to 199A, there was already a modest increase in hiring workers as contractors rather than employees (Katz and Krueger, 2019; Abraham et al., 2018). This rise in contracting could be driven by firms' and workers' changing demands for the traditional employee benefits versus workplace autonomy and flexibility. Additionally, new platform economy companies such as Uber and Lyft have used a large number of contractors to provide their services. We confirm the rising trend in contractor transitions using information on non-employee compensation from the Form 1099-MISC. One caveat for our analysis is that we do not directly use information from the Form 1099-K, where many platform economy workers receive their compensation, because of inconsistent reporting over time among some companies (Handwerger, 2018; Collins et al., 2019). If 1099-K recipients properly report their income, they are included in our analysis when we consider Schedule C filing as a proxy for contracting. However, to the extent that new 1099-K recipients fail to report their income, we are unable to detect a rise in this activity.

We use a number of approaches to test whether contracting has increased in response to Section 199A. First, we examine whether worker reclassifications within firms increased in 2018. While some analysts predicted that these types of changes would be substantial, the Section 199A regulations specify that the nature of the work relationship must change for an employee to become an independent

contractor; otherwise the contractor income would be deemed ineligible for the deduction, possibly disincentivizing some of these transitions. We begin with our Reclassified Worker Sample, which is the universe of individuals who receive non-employee compensation on a Form 1099-MISC in year t (2007 to 2018) and also wages on a Form W-2 issued by the same employer (as proxied by EIN) in any of the years $t-1$, t, or $t+1$. We define transitions as a change in the primary type of income the worker receives from the firm, where the primary type of income must be at least 60 percent of labor income paid that year. In particular, we say an employee-to-contractor reclassification occurs in year t when an individual receives at least 60 percent of labor income from a firm on Form W-2 in year $t-1$ and at least 60 percent of labor income from that firm on Form 1099-MISC in year t.

Panel (a) of Figure 9 shows the total number of workers who experience these employee-to-contractor reclassifications each year. There is no increase in 2018. Similarly, panel (b) shows that the number of EINs that have at least one worker moving from employee to contractor status did not increase in 2018. Our data show no evidence that firms, at least within the same EIN, are reclassifying existing workers from employees to contractors in response to 199A.

Next, we examine transitions to contractor status more generally, including transitions between firms. Using our Individual Tax Filer Sample, we examine three types of transitions towards contracting: new receipt of any contracting income as measured by non-employee compensation income from a Form 1099-MISC, newly receiving the majority of labor income from 1099-MISC contracting (which we refer to as being a "primary contractor"), and newly filing a Schedule C. Although the Schedule C measure is an indirect and imperfect measure of contracting (because Schedule C includes other types of income as well), we include it as 199A may encourage individuals to report contracting income that may have otherwise gone unreported (Collins et al., 2019). In addition, the Schedule C measure includes contractors whose income is reported on Form 1099-K, allowing us to study this population as well.

Trends in our three measures of contractor transitions are shown in Figure 10, which plots the likelihood of a transition to contractor status for an individual taxpayer, relative to the 2017 level of transitions. The green line represents transitions to primary contractor status. The probability of becoming a primary contractor is roughly constant from 2008 through 2018; we do not find a discrete jump in 2018. The navy blue and aqua lines are for transitions into any contractor income and Schedule C filing, respectively. Both of these lines show steady upward trends from 2008-2017, and these increases continue into 2018, with no evidence of sharp departures from the trend.

As with our time series evidence on pass-through income, these analyses are not definitive, as one cannot know the counterfactual outcomes that would have obtained in 2018 in absence of 199A. Thus we again employ a difference-in-difference approach to better isolate the causal effects of 199A, comparing individuals above and below the 199A income thresholds (based on prior year income).[36] We assume that contractors above the thresholds are providing labor services and therefore are ineligible for a substantial 199A deduction either because their business is an SSTB or because it is a non-SSTB with insufficient amounts of wages paid or tangible capital. To the extent that this assumption fails, it biases our estimates towards zero, as some control group observations (those above the threshold) will in fact be treated.

Figure 11 plots the results of this difference-in-difference analysis. The three panels correspond to our three measures of transitions: primary contractor, any contracting income, and Schedule C fil-

[36]This analysis requires the individual to have filed a Form 1040 in both the year of analysis and the prior year. The aggregate statistics discussed previously in this subsection only require filing in the year of analysis.

ing. In all panels, the orange line denotes the treatment group (taxpayers below the threshold) while the green line denotes the control group (taxpayers above the threshold). We do not see strong evidence of a causal effect of 199A on contractor transitions. In Panel (a), while taxpayers below the threshold experience a slight increase in the probability of switching to primary contractor status in 2018 and taxpayers above the threshold experience a slight decrease, the differences between the two point estimates are small and statistically insignificant. Moreover, there are larger differences between the two groups in several of the years prior to 2017. Panels (b) and (c) tell a similar story. The year 2018 does not appear to be an unusual year for contractor transitions nor does the above versus below difference-in-differences comparison suggest a large treatment effect from 199A.

Next, we examine whether individuals who were already receiving contracting income shift their compensation towards contracting using a similar empirical approach. We first show the share of labor income an individual receives from contracting in year t among those who had contracting income in year $t-1$ (Appendix Figure C2, Panel A). If the individuals who were contractors in 2017 shifted their compensation towards contracting in 2018, we would expect a positive estimate. The point estimate for 2018 is negative and not statistically different from zero. In Panel B, we look at the average within person percentage change in the share of contractor income from the prior year among the same population. The percentage change is defined using the DHS difference: $\frac{contshare_t - contshare_{t-1}}{0.5*(contshare_t + contshare_{t-1})}$. Here we see a slight increase in the share, but it may be a continuation of an existing trend prior to 199A. In Panel C, we examine the DHS difference in Form W-2 wages among those with both wage and contractor income in year $t-1$ to test whether individuals with both types of income earn lower wages in response to 199A. The point estimate is positive, which is the opposite sign we would expect if these individuals shifted labor supply to their contracting work and away from wage and salary employment.[37]

Finally, we check whether individuals who are new contractors in 2018 are more likely than existing contractors to claim the 199A deduction. If a substantial number of individuals transition to contracting *because* of the deduction, they should be more likely to claim it. Table 3 shows the probability that new 2018 contractors claim the deduction relative to existing contractors. The top panel examines individuals who become primary contractors in 2018, while the bottom panel focuses on individuals who start receiving any contractor income that year. The first four columns use all existing contractors of that type as a reference group and the last four use new 2017 contractors only. The odd columns report raw regression results, without any additional covariates. In these columns, we find that new 2018 contractors are significantly *less* likely claim the section 199A deduction than existing contractors, a wrong-signed effect relative to the hypothesis that new contractors are transitioning to take advantage of section 199A. Once we add controls for taxable income, contractor income, and demographic characteristics, these differences shrink much closer to zero, though they remain negative in all specifications.[38] We also test whether the predicted positive effect may be limited to those with incomes below the 199A threshold in columns 3-4 and 7-8, but the point estimates are similar and negative. Thus, relative to both reference groups, individuals who became contractors in 2018 are less likely to claim the deduction, even after

[37] Appendix Figure C3 shows the same outcomes as Figure C2 using our difference-in-differences strategy. None of the panels shows evidence that taxpayers with income below the threshold shifted their compensation towards contracting income relative to those above the threshold.

[38] Across specifications, we find that the contractor income and taxable income controls explain the vast majority of the difference in coefficients between "no controls" and "controls." On average, new contractors earn less in contracting income and have lower taxable income than existing contractors; furthermore, higher contracting income and higher taxable income is correlated with claiming the section 199A deduction. These omitted variables drive the large negative estimates in the "no controls" columns.

controlling for taxable income, contractor income, and demographic characteristics.

Taken together, our analyses of contractor transitions do not provide any evidence of a substantial increase in independent contracting as a result of section 199A. It is possible that the tax wedge was not large or salient enough to encourage many individuals to change employment types, or that the kind of substantial shift that many predicted will occur only over a number of years as individuals change jobs and employers.

III.C Effects on real outcomes

In this section, we evaluate the evidence that section 199A impacted real inputs to production. We test whether investments in capital and labor changed in response to the deduction. While these investments would likely lead to increases in pass-through income in the long-run, they may decrease income in the short-run by increasing business deductions, potentially changing the interpretation of our earlier analyses of pass-through business income.

Section 199A changed the tax rate on business income for certain firms, which can alter their profit maximization decisions in a model of entrepreneurial effort or under imperfect deductibility of capital expenses. In the standard user cost of capital model (Hall and Jorgenson, 1967), the firm's break-even rate of return (f_K) on a marginal investment in tangible property is given by:

$$f_K = \frac{1-\tau z}{1-\tau} \times (\delta + r). \tag{2}$$

In this expression, τ is the tax rate, z is the schedule of depreciation deductions converted to present value, δ is the geometric depreciation rate, and r is the firm's exogenous discount rate. Thus, so long as $z < 1$, a reduction in tax rate reduces the required rate of return, and thus could increase investment. Furthermore, to the extent that labor is either a complement or substitute to capital, the tax rate could also be expected to affect employment (with ambiguous sign).

One complication is that, in fact, it is the case that $z = 1$ (which corresponds to the case of full expensing) for many types of investment by pass-through firms. Under sections 179 and 168(k) (as amended by TCJA), most equipment investment can be deducted immediately, in the initial year. Thus, taking this model literally, we should not expect exposure to section 199A to affect investment in categories of assets eligible for full expensing. However, a small modification to the standard model implies that the tax rate could affect investment. In particular, suppose that for each dollar of investment, the firm incurs c dollars of non-deductible costs (e.g., entrepreneurial effort). In that case, the threshold rate of return becomes:

$$f_K = \frac{1+c-\tau z}{1-\tau} \times (\delta + r) \tag{3}$$

In this case, even with $z = 1$, a lower tax rate decreases the required rate of return. Thus, under this extension to the standard model, exposure to section 199A could plausibly increase investment.

We test for responses along these margins using the S Corporation Sample. First, we study tangible investment, which we define as the sum of property placed in service on Form 4562, including structures and equipment, whether expensed (under section 179 or bonus depreciation) or depreciated over time. One limitation is that data from this form are available to us only for the 90 percent of S corporations that file Form 1120S electronically. Conditional on filing electronically, approximately 50 percent

report some investment on Form 4562.[39]

Our analysis compares firms that are classified as SSTBs to those who are non-SSTBs.[40] In particular, among the set of firms with at least 50 percent of owners above the phaseout thresholds (in $t-1$), we regress the DHS difference in tangible investment on SSTB status and SSTB status interacted with year indicators, omitting 2017. The results are presented in the left panel of Figure 12; while there is some choppiness in the pre-treatment period, there is no evidence of any treatment effect in 2018. The right panel of Figure 12 adds a control for twenty bins of $t-1$ investment interacted with year. This control calms the choppiness in the pre-period and increases precision somewhat. In this specification, using a 95 percent confidence interval, we can rule out increases in investment in excess of two percentage points caused by exposure to section 199A.

To evaluate the magnitude of this effect, we translate this estimate into the implied effect of a change in the "tax term" (that is, $\frac{1+c-\tau z}{1+t}$) on investment scaled by (lagged) capital. This parameter, motivated by the Q-theory of investment, has been estimated in the context of C corporations, with a "consensus" range of 0.5-1.0 (Hassett and Hubbard, 2002). Consider the illustrative case with $z = 1$ (full expensing) and $c = 0.1$; that is, each dollar of investment expense is associated with 10 cents of non-deductible costs such as entrepreneurial effort. In this case, exposure to section 199A causes the tax term to change by 0.0167 for top-bracket taxpayers (who face a statutory federal tax rate of 37 percent). Furthermore, the top of the confidence interval corresponds to an effect of section 199A on log investment of 0.02. At the average values of investment and lagged assets, this corresponds to an effect of section 199A on investment scaled by assets of 0.001. Scaling this effect by the change in the tax term leads to a value of 0.067 for the structural parameter. Therefore, with $c = 0.1$, we can bound the effect on investment to be much lower than has been estimated in the literature (predominantly for C corporations). However, this parameter scales linearly with the inverse of c, for which we have little a priori evidence. For instance, if we instead assume $c = 0.01$, then we would not be able to rule out a value of the parameter in line with other estimates. In other words, two scenarios are equally consistent with our evidence: either (1) S-corporation investment is relatively unresponsive to large changes in investment incentives, or (2) the change in investment incentives due to 199A is small in the presence of full expensing. We cannot distinguish between these hypotheses. In either case, though, we find no evidence that section 199A affected investment in 2018.

Next, we study the effect of the deduction on wages and employment in S corporations. Even in the absence of an effect on investment, an employment and wage response could occur in a model of bargaining or surplus-sharing (Risch, 2020). We begin by studying the number of employees. We define the total number of employees as equal to the number of Forms W-2 issued to individuals other than shareholders.[41] As with investment, we use SSTB status for identification. We regress the DHS difference in the number of employees on the SSTB indicator and its interactions with year, omitting 2017.

Panel A of Figure 13 presents these results without any additional fixed effects. There exists a modest pre-treatment trend, with this trend appearing to continue into 2018. The confidence intervals are

[39] These statistics restrict to the set of S corporations with high-income owners, which is the potential universe in this specification, as discussed below.

[40] Classifying firms based on whether their owners are above or below the phaseout thresholds yields results with large pre-treatment trends, suggesting that the parallel trend assumption does not hold in this specification. For this reason, we do not use this identification strategy in this section.

[41] There will be some measurement error in these definitions, since firms need not use the same EIN on their W-2's as they do on their Form 1120S. However, we expect this measurement error to be modest for all but the largest firms and the relatively small number of firms that use payroll service firms as Professional Employer Organizations.

sufficiently narrow as to rule out effects in excess of a 0.5 percent increase in the number of employees. Panel B of Figure 13 adds controls for twenty bins of $t-1$ employment interacted with year. The additional controls have little effect on the point estimate but tighten the confidence intervals, ruling out any meaningful increase in the number of employees.

Panels C and D of 13 repeat this analysis using the DHS difference in wages paid to all non-shareholder employees as the outcome of interest. Both in the baseline specification (Panel C) and in the specification that controls for the baseline level of wages interacted with year (Panel D), we fail to uncover an effect of section 199A exposure on wages. In both specifications, we can rule out an effect in excess of one percent.

In sum, we find no evidence that exposure to section 199A changed real outcomes in the form of investment, employment, or wages by S corporations. We stress, however, that we might expect real effects to occur after a lag; all we are able to do is rule out large short-run effects.

IV Conclusion

Overall we find scant evidence of large responses by businesses and taxpayers to 199A in the first year that the deduction was available. Eligibility for the deduction does not appear to have impacts on the fraction of adjusted gross income that is qualified business income. In our most credible difference-in-differences specification, we compare taxpayers above versus below the claiming threshold (all of whom own service sector trade or businesses). In this specification, we can rule out an increase in the share of income attributable to potential QBI in excess of 0.2 percentage points (Figure 2 panel A). Likewise, we find no effect (or, if anything, slight wrong-signed effects) of section 199A exposure on the total amount of potential QBI.

Section 199A creates incentives to reduce wages (and increase profits) paid to shareholders of S corporations. This incentive is particularly strong for single shareholder businesses where the recipient of the wage income and business income is the same person. Yet following the passage of section 199A, we do not see evidence of changes in wages paid by S corporations – either in the time series, or when comparing single- and multi-shareholder S corporations. The one important exception to this finding is that some S corporations owners are bound by the wage and capital limitation in their ability to claim the deduction. For these businesses we do see the predicted increase in wages paid which would increase the available deduction.

Among partnerships, section 199A similarly creates strong incentives to reduce guaranteed payments (and increase profits) since labor income can face a higher tax rate than business income. Here we do find a sharp reduction in guaranteed payments (by about 20 percent) and a sharp rise (10 percentage points) in the fraction of partnerships that cease making guaranteed payments in 2018.

When we test for an increase in the number of workers who transition from employee to contractor status, we see little effects associated with Section 199A. This is a key finding of our work since many observers were concerned that 199A would accelerate a trend towards contracting and would reduce access to employer-sponsored health and retirement plans as well as the job stability associated with employee status. Similarly, we find no evidence of any immediate "real" responses to section 199A in terms of investment, employment, or wages.

In sum, the first-year responses of businesses and their taxpayers owners to 199A are modest. A critical question is whether businesses will make further and more significant adjustments in coming years as they have more time to reorganize and make tax-advantageous shifts and as they better under-

stand the rules surrounding the deduction.

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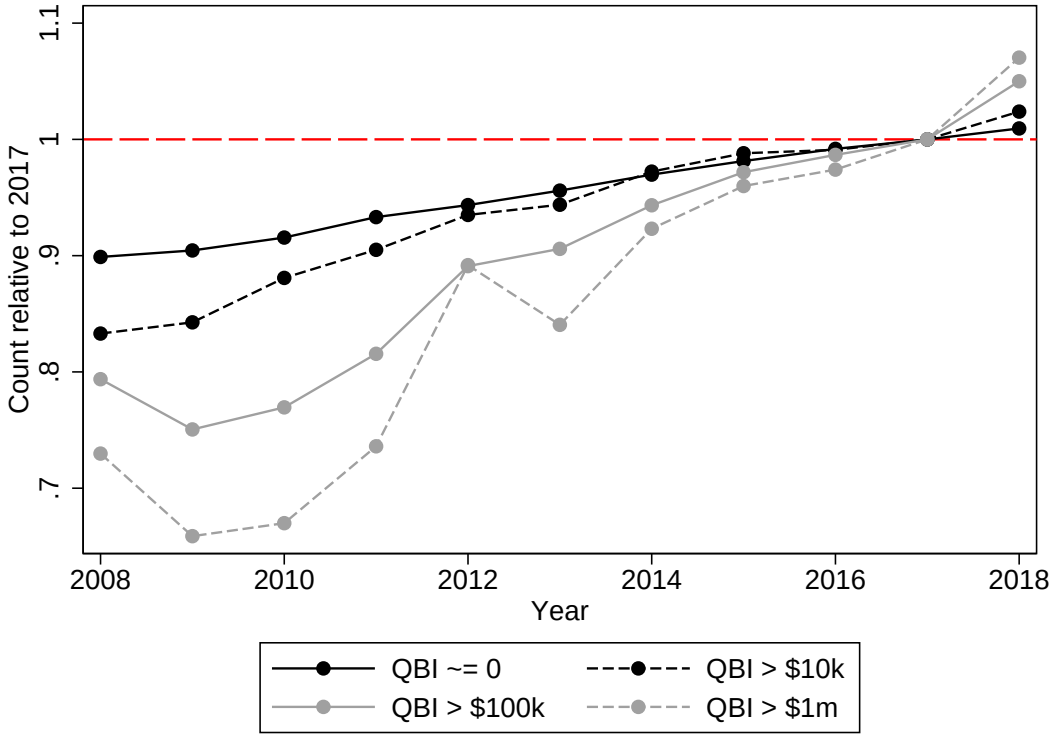
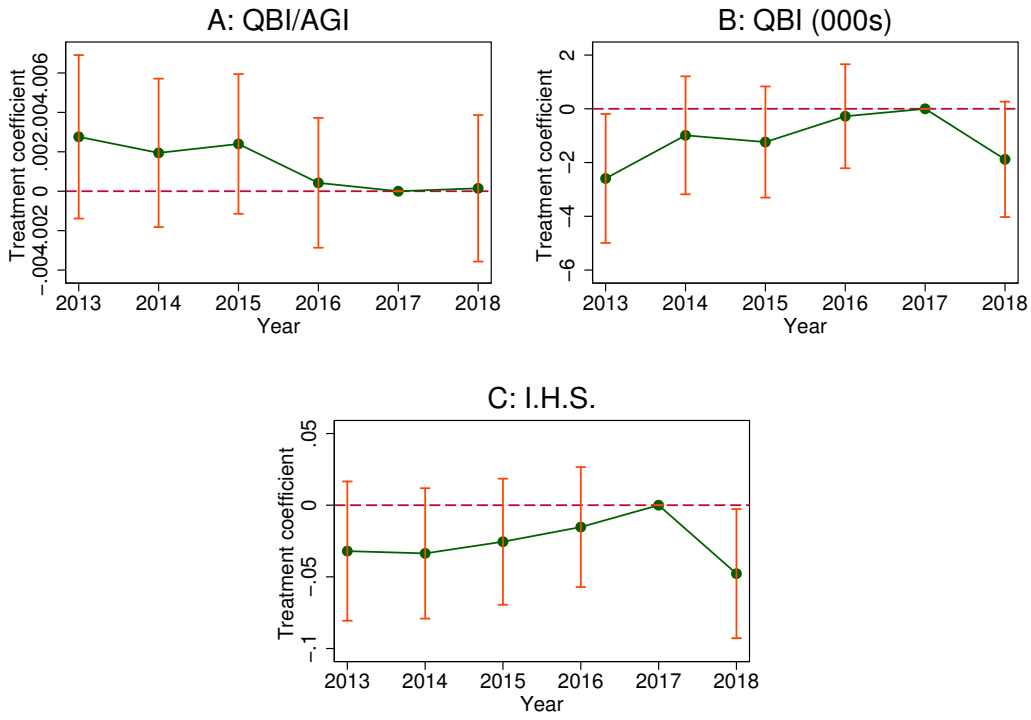
Tables and Figures

Figure 1: Counts of tax units with pass-through income over time, relative to 2017



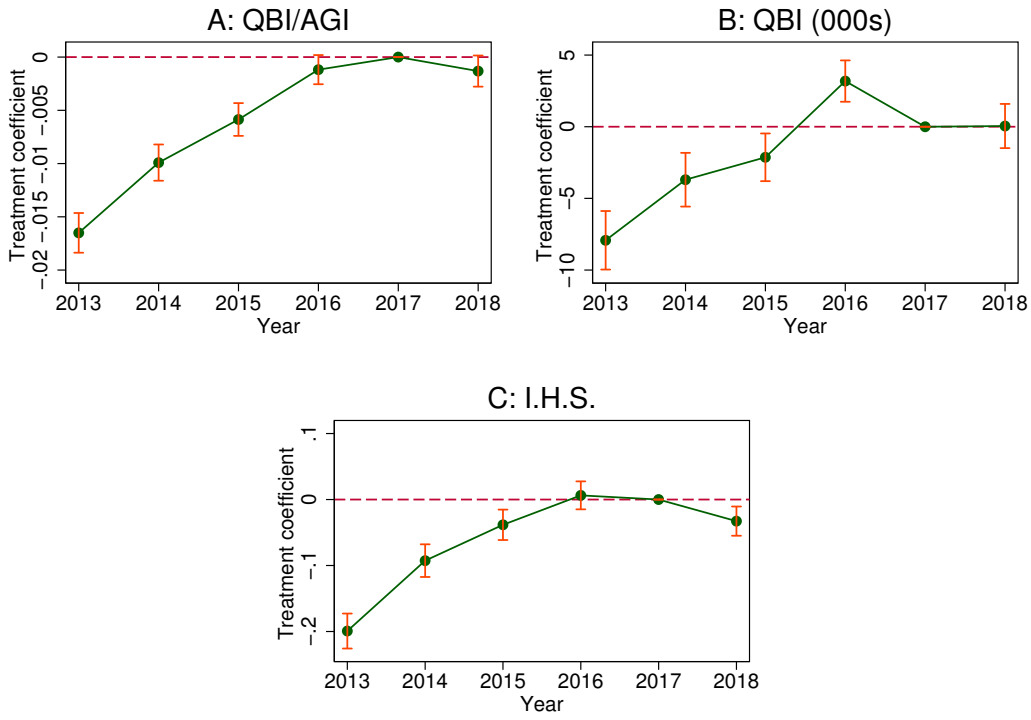
Notes: Using the Pass-through Owners Sample, this figure plots aggregate counts of pass-through owners satisfying various criteria relative to those counts in 2017. The solid black series plots the aggregate counts of those with non-zero potential QBI. The remaining series plots the aggregate counts of those with potential QBI exceeding $10,000, $100,000, and $1,000,000, respectively. Here potential QBI is the sum of profits/losses from sole proprietorships, partnerships, S-corporations, Schedule F income, and Schedule E rents and royalties. All dollar values are adjusted for inflation to 2018 values. All panels were created by the authors using data from the population of tax returns.

Figure 2: Difference-in-differences: comparing those above and below income thresholds



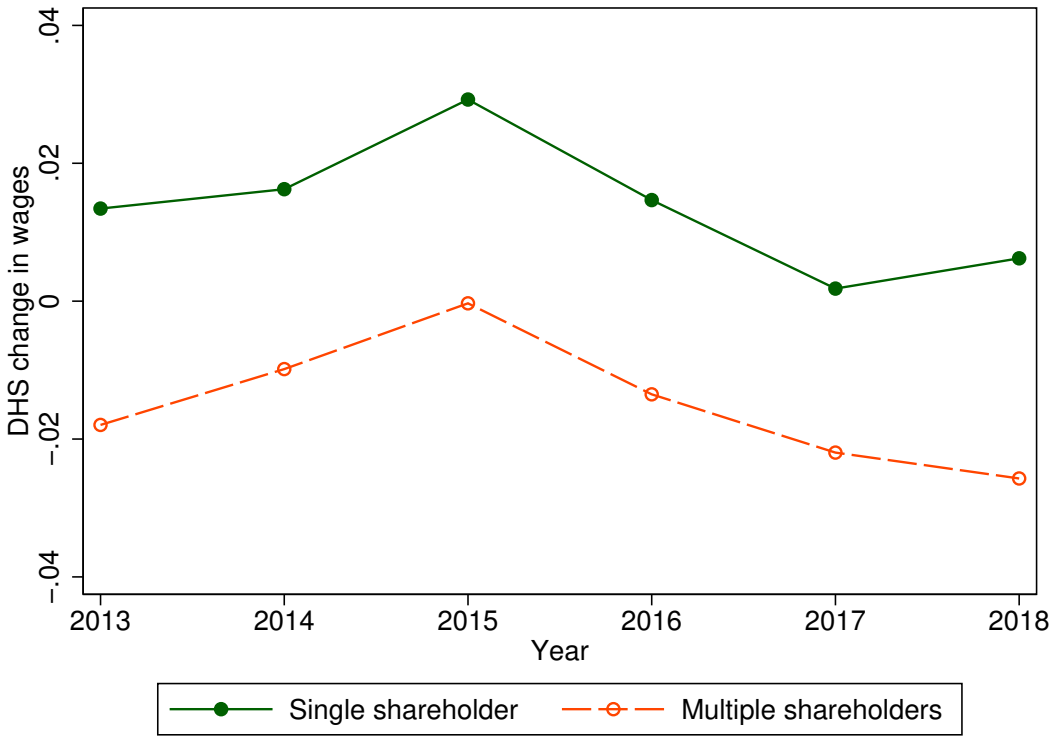
Notes: This figure presents regression estimates of the year-specific treatment effects (γ_t) in equation (1), using our Pass-through Owners Sample. The regression sample is limited to SSTB owners near the 199A thresholds, and treatment is defined as being below the thresholds. In Panel A, the share of AGI attributable to potential QBI as the dependent variable. In Panel B, the dependent variable is a dummy for non-zero potential QBI. In panel C, the dependent variable is potential QBI (in 000s), Winsorized at the 1st and 99th percentiles. In panel D, the dependent variable is the inverse hyperbolic sine of potential QBI (scaled in 000s). Here potential QBI is the sum of profits/losses from sole proprietorships, partnerships, S-corporations, Schedule F income, and Schedule E rents and royalties. See Section III.A for further regression details. All panels were created by the authors using data from the population of tax returns.

Figure 3: Difference-in-differences: comparing SSTB and non-SSTB owners



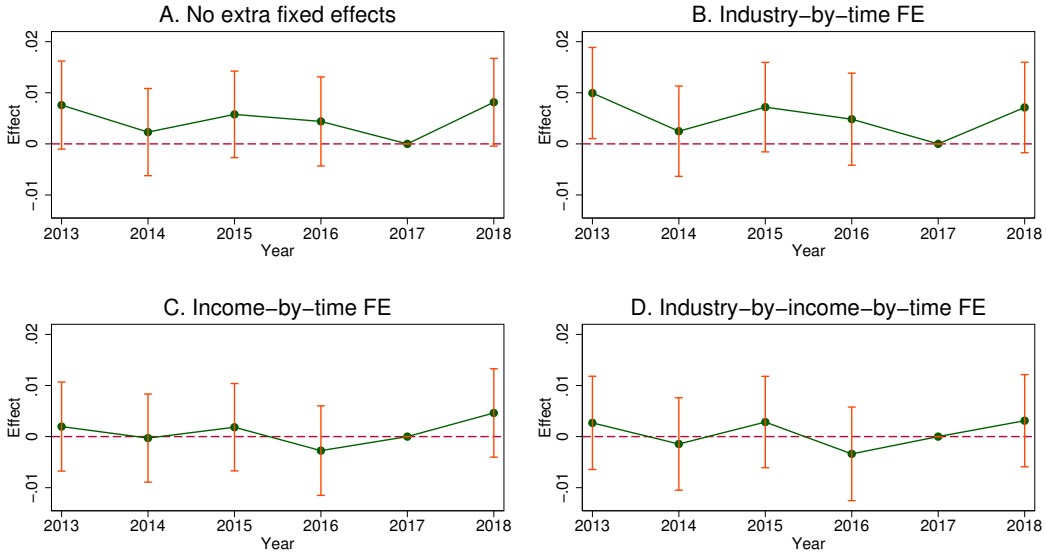
Notes: This figure presents regression estimates of the year-specific treatment effects (γ_t) in equation (1), using our Pass-through Owners Sample. The regression sample is limited to taxpayers above the 199A thresholds, and treatment is defined as being a non-SSTB owner. In Panel A, the share of AGI attributable to potential QBI as the dependent variable. In Panel B, the dependent variable is a dummy for non-zero potential QBI. In panel C, the dependent variable is potential QBI (in 000s), Winsorized at the 1st and 99th percentiles. In panel D, the dependent variable is the inverse hyperbolic sine of potential QBI (scaled in 000s). Here potential QBI is the sum of profits/losses from sole proprietorships, partnerships, S-corporations, Schedule F income, and Schedule E rents and royalties. See Section III.A for further regression details. All panels were created by the authors using data from the population of tax returns.

Figure 4: Raw wages to shareholders



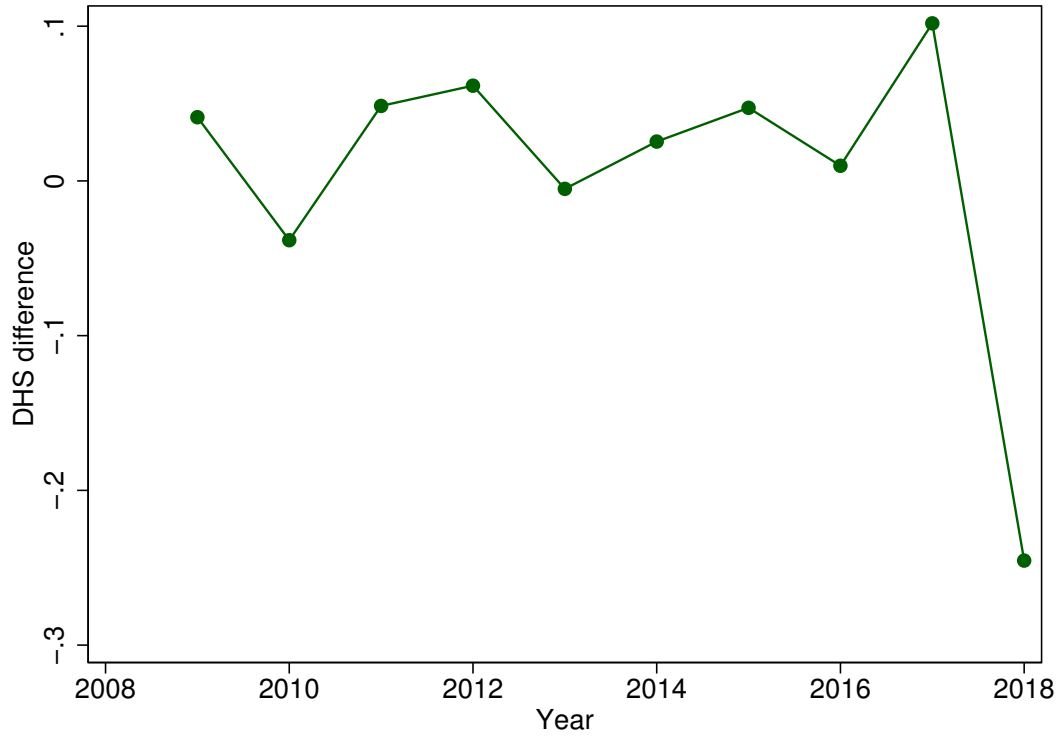
Notes: Using the S Corporation Sample, this figure plots the average DHS difference in wages to shareholders w_{it}, separately by single- and multiple-shareholder S corporations. The DHS difference is defined as $\frac{w_{it}-w_{i,t-1}}{0.5(w_{it}+w_{i,t+1})}$.

Figure 5: Event study: wages to S corporation shareholders



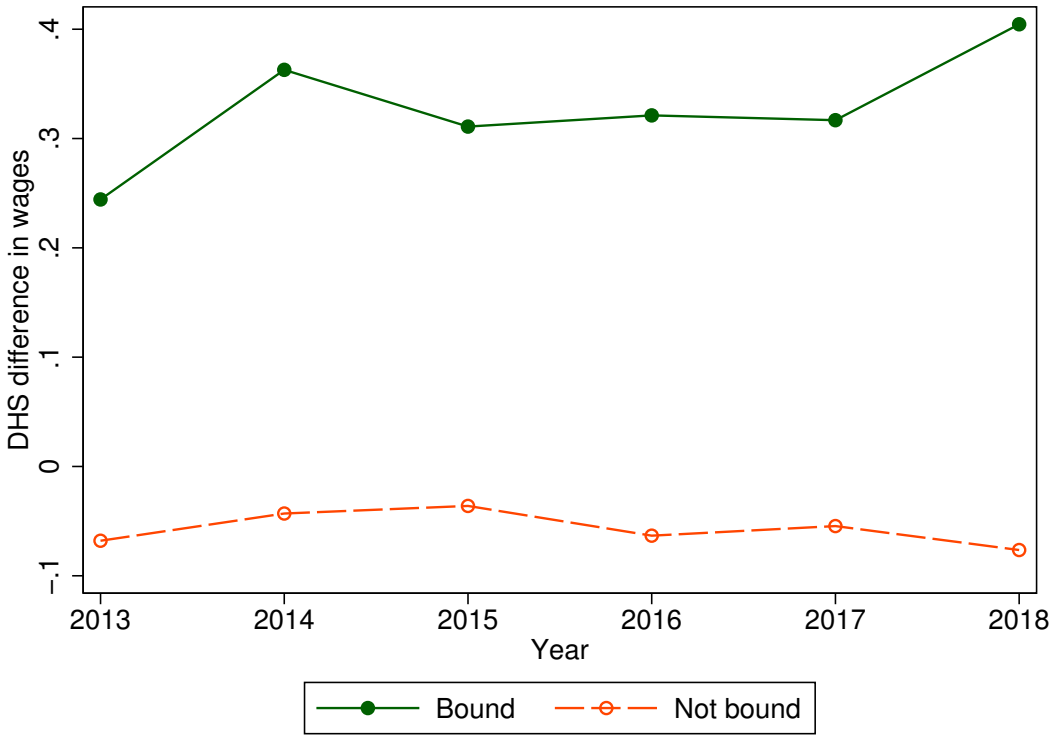
Notes: This figure plots the event study coefficients of the DHS difference in wages to shareholders, omitting 2017. The treated category is single-shareholder firms (defined as of time $t-1$); the control category is multiple-shareholder firms. Panel A includes only treatment and year fixed effects. Panel B includes treatment and year-by-industry fixed effects, where industry is the three-digit NAICS code (as of $t-1$). Panel C includes the treatment fixed effects and a fixed effect for year interacted with 20 bins of $t-1$ business income, where business income is defined as ordinary income plus wages to shareholders. Panel D includes a treatment fixed effect and fixed effects for business income interacted with industry interacted with year. The DHS difference is defined as $\frac{w_{it}-w_{i,t-1}}{0.5(w_{it}+w_{i,t+1})}$.

Figure 6: Change in guaranteed payments



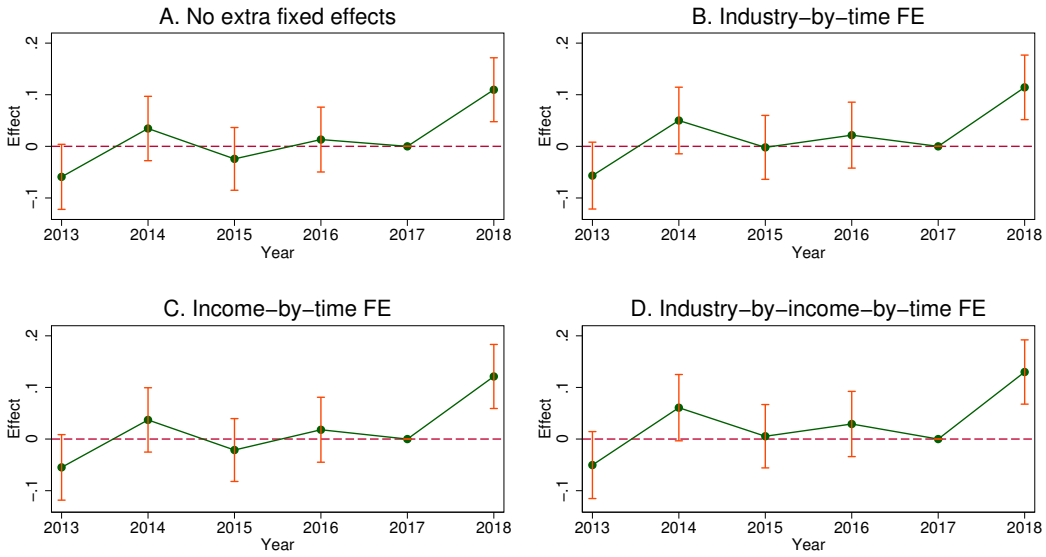
Notes: This figure plots the DHS difference in guaranteed payments to partners, using the Pass-through Owner Sample, restricted to observations who are partners in both $t-1$ and t. The DHS difference is defined as $\frac{w_{it}-w_{i,t-1}}{0.5(w_{it}+w_{i,t+1}}$).

Figure 7: Raw wages to shareholders: those bound by wage limitation



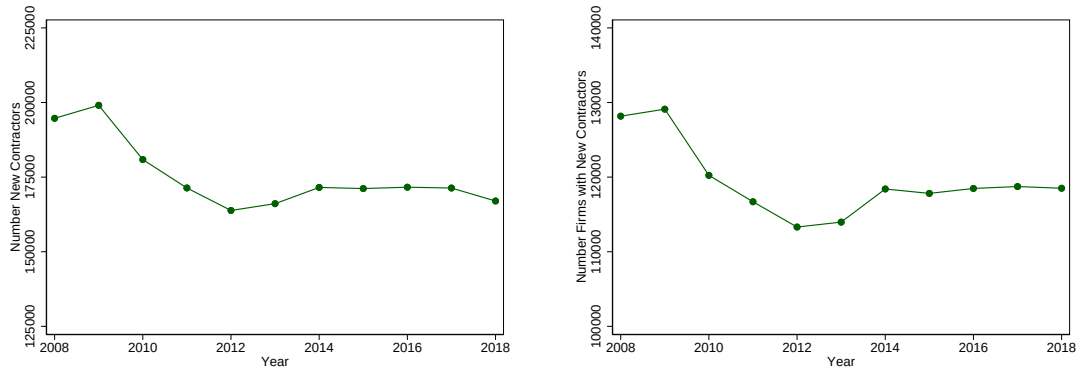
Notes: Using the S Corporation Sample, this figure plots the DHS difference in wages to a subset of S corporation shareholders. In particular, the sample is restricted to those firms that (as of t_1) are non-SSTBs, have one shareholder, and that one shareholder has income above the 199A thresholds. Firms are grouped into two categories: bound (those whose simulated 199A deduction in $t-1$ would have been reduced by at least 50 percent by the wage limitation, assuming no tangible capital) and unbound (those whose simulated 199A deduction in $t-1$ would not have been affected by the wage limitation). Firms whose deduction would have been reduced by more than zero but less than 50 percent are dropped. The DHS difference is defined as $\frac{w_{it}-w_{i,t-1}}{0.5(w_{it}+w_{i,t+1}}$).

Figure 8: Event study: S corporations bound by wage limitation



Notes: This figure is the event study that corresponds to Figure 7, omitting 2017. The treatment group are the "bound" firms and the contrl group are the "unbound" firms. Panel A includes only treatment and year fixed effects. Panel B includes treatment and year-by-industry fixed effects, where industry is the three-digit NAICS code (as of $t-1$). Panel C includes the treatment fixed effects and a fixed effect for year interacted with 20 bins of $t-1$ business income, where business income is defined as ordinary income plus wages to shareholders. Panel D includes a treatment fixed effect and fixed effects for business income interacted with industry interacted with year. See also the notes to Figure 7.

Figure 9: Employee-to-contractor reclassifications

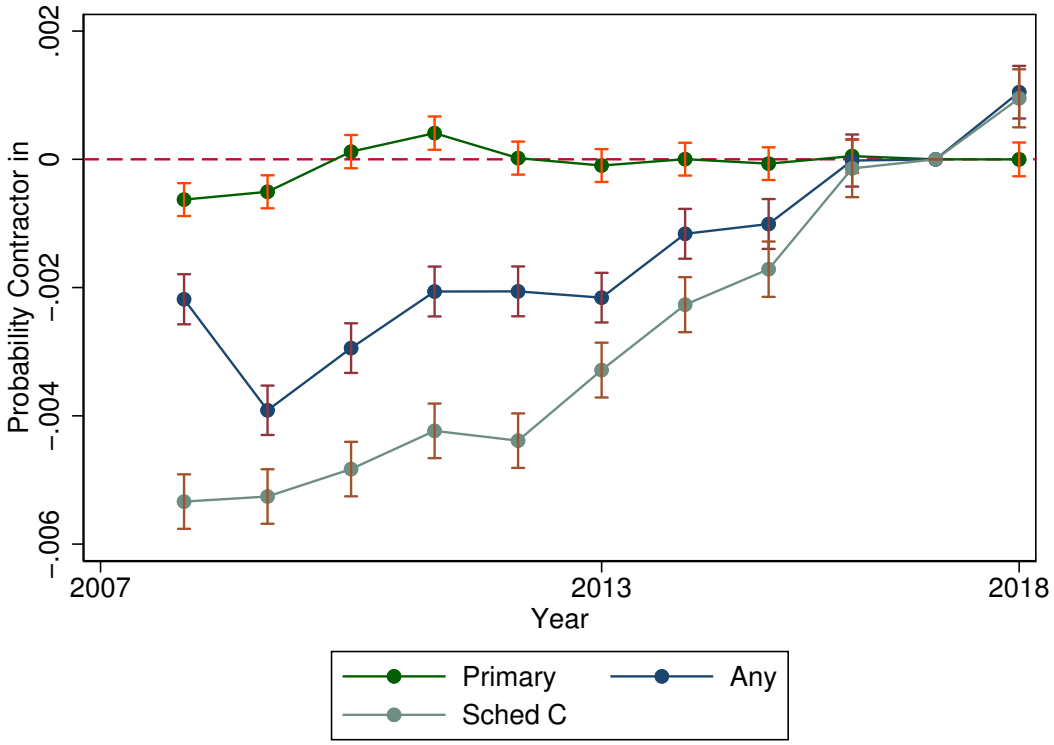


(a) Individuals

(b) Firms

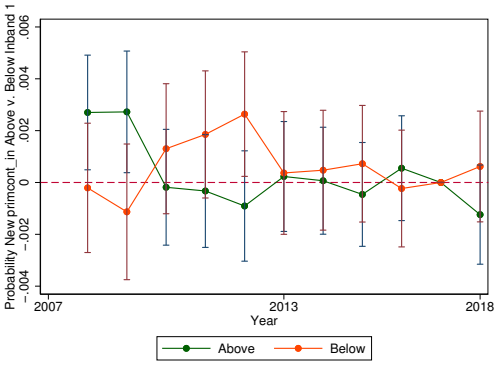
Notes: Panel (a) shows the total number of individuals who experience employee-to-contractor reclassifications, while panel (b) shows the total number of firms who experience these reclassifications. An employee-to-contractor reclassification occurs when an individual receives at least 60 percent of labor income from a firm in the form of wage income in year $t-1$ and as contractor income in year t. Data come from our Worker Reclassification Sample, derived from administrative records of individual tax returns and information returns processed by the Internal Revenue Service.

Figure 10: New contractor transitions

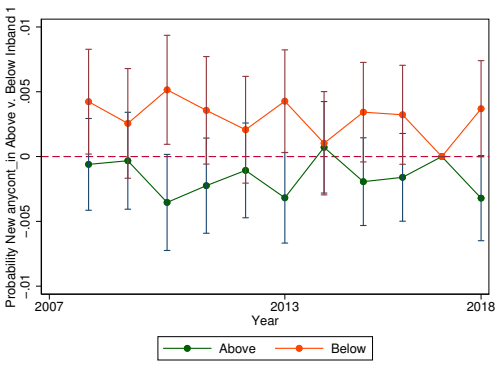


Notes: Transitions into receiving any Form 1099-MISC non-employee compensation, receiving majority of labor income from Form 1099-MISC non-employee compensation, and filing a Schedule C – all relative to 2017. The sample represents individuals 25-65 years of age who file a Form 1040.

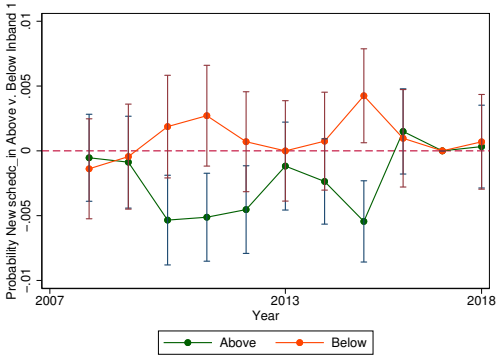
Figure 11: Difference-in-differences: contractor transitions



(a) Above vs. below Primary Contractor



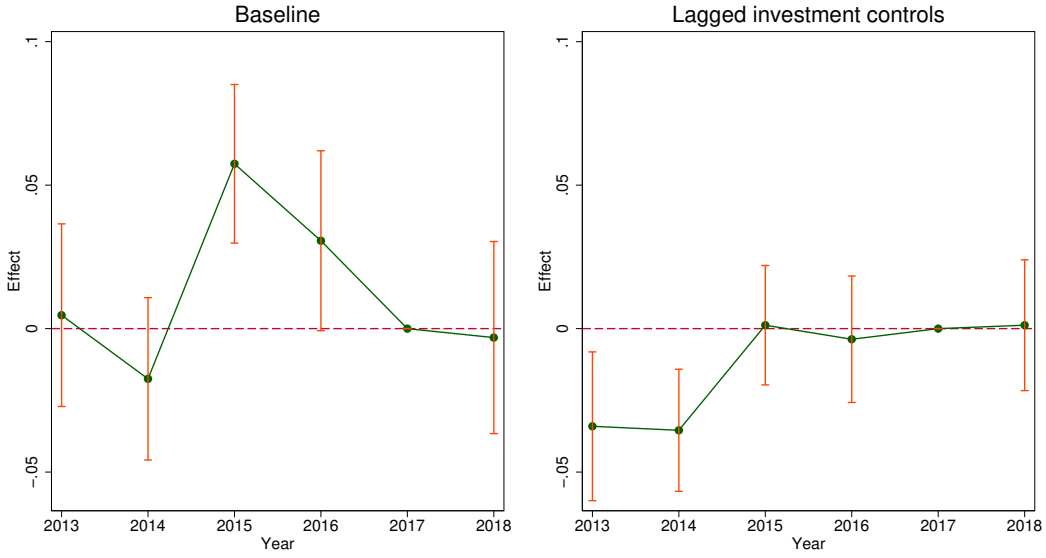
(b) Above vs. below Any Contracting



(c) Above vs. below New Schedule C

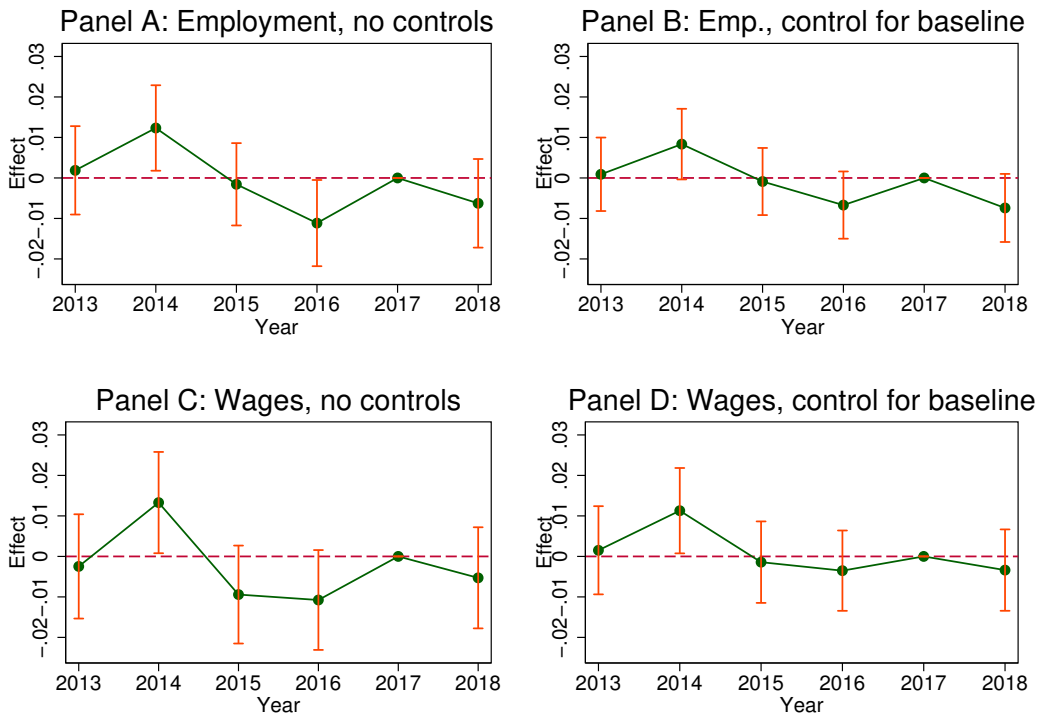
Notes: Difference in difference estimates comparing individuals with taxable income in the prior year placing them between 50% and 200% of the income threshold. Sample represents individuals 25-65 years of age who file a Form 1040 in both the current and prior tax year. Panel (a) shows estimates for transitions into receiving a majority of labor income from Form 1099-MISC NEC, (b) shows estimates for transitions into receiving any Form 1099-MISC NEC income, and (c) shows estimates for new Schedule C filings.

Figure 12: Effect of 199A exposure on S-corporation investment



Notes: This figure plots an event study of the effect of section 199A on investment, I_{it}, in the S Corporation Sample. The dependent variable is the DHS difference of investment, $\frac{I_{it}-I_{i,t-1}}{0.5(I_{it}+I_{i,t+1}}$). Investment is defined as the basis of all property placed in service as reported on Form 4562. The sample is restricted to S corporations for whom at least half of shareholders (weighted by ownership) had income in excess of the 199A thresholds in $t-1$. Firms that are non-SSTBs (determined as of $t-1$ are the treated group; SSTBs are control. Panel A includes only treatment and year fixed effects. Panel B includes a treatment fixed effect and fixed effects for twenty bins of $t-1$ investment. The sample is additionally restricted to those firms that file Form 1120S electronically in both t and $t-1$. Standard errors are clustered by firm.

Figure 13: Effect of 199A exposure on S-corporation employment and wages



Notes: Panels A and B figure plots an event study of the effect of section 199A on number of non-shareholder employees in the S Corporation Sample. Panels C and D plot an event study of the effect of section 199A on the wages paid to non-shareholders. The dependent variable is the DHS difference of employment or wages (y_{it}), respectively, $\frac{y_{it}-y_{i,t-1}}{0.5(y_{it}+I_{y,t+1}}$). Employment is measured as the number of Forms W-2 issued by the firm, excluding those issued to shareholders; wages are measured as total (box 1) wages on such Forms W-2. The sample is restricted to S corporations for whom at least half of shareholders (weighted by ownership) had income in excess of the 199A thresholds in $t-1$. Firms that are non-SSTBs (determined as of $t-1$ are the treated group; SSTBs are control. Panels A and B include only treatment and year fixed effects. Panels B and D include a treatment fixed effect and fixed effects for 20 bins of $t-1$ employment or wages. Standard errors are clustered by firm.

Table 1: Summary statistics on individual samples

	Pass-through Owner Sample	2018 Sample	Individual Tax Filer Sample	Worker Reclassification Sample
Fraction married filing jointly	0.44	0.36	0.34	0.53
Fraction non-joint male	0.27	0.30	0.33	0.27
Fraction non-joint female	0.29	0.34	0.33	0.21
Mean age	46.4	45.3	44.6	43.1
Years covered	2008-2018	2018	2007-2018	2007-2018
Observations (thousands)	33,809	6,141	37,686	32,227

	Mean	Median	Standard Deviation	Fraction with nonzero value
Pass-through Owner Sample				
Adjusted gross income	83,795	40,500	957,956	0.90
Sole proprietorship income	4,180	0	2,565,509	0.31
S-corp and partnership income	7,374	0	574,901	0.11
Partner guaranteed payments	715	0	69,170	0.01
Rent and royalty income	573	0	45,867	0.14
Potential QBI	13,037	0	8,832,437	0.50
2018 Sample				
Adjusted gross income	76,722	40,800	794,086	0.99
Sole proprietorship income	2,078	0	3,198,553	0.17
S-corp and partnership income	4,518	0	419,794	0.06
Partner guaranteed payments	381	0	25,241	0.00
Rent and royalty income	352	0	353,351	0.07
Potential QBI	7,322	0	2,198,109	0.27
199A deduction	1,017	0	46,390	0.13
Individual Tax Filer Sample				
Adjusted gross income	48,647	15,600	626,899	1.00
Labor income	22,436	1,500	171,075	0.53
Wages	21,142	200	141,580	0.51
Contractor income	1,294	0	95,549	0.06
Worker Reclassification Sample				
Labor income	43,480	21,200	1,515,979	1.00
Wages	33,651	12,300	253,256	0.78
Contractor income	9,829	1,000	1,494,336	0.58

Notes: See discussion in Section II for our sample and variable definitions. Observation counts are rounded to the nearest thousand, and dollar-denominated medians are rounded to the nearest hundred. All dollar values are adjusted for inflation to 2018 levels. Sample weights are used for tabulations using the Pass-through Owner Sample and the 2018 Sample, except for reported observation counts. Data are derived from administrative records of individual tax returns and information returns processed by the Internal Revenue Service.

Table 2: Distribution of 199A tax savings in 2018

Income (AGI)	Total pass-through income ($mil) (1)	Total 199A deductions ($mil) (2)	Total tax savings ($mil) (3)	Mean nonzero savings (4)	Median nonzero savings (5)	Number with pass-through income (thou) (6)	Percent of (6) with tax savings
Negative AGI	-65,032	7	0	—	—	1,191	0.0%
Decile 1: 0-8,400	15,745	52	9	200	0	3,138	1.3%
Decile 2: 8,400-15,400	41,601	166	17	0	0	3,966	12.4%
Decile 3: 15,400-23,000	28,178	831	84	100	100	3,196	31.4%
Decile 4: 23,000-31,300	20,123	1,510	169	100	100	2,715	46.6%
Decile 5: 31,300-41,300	18,243	2,530	282	200	200	2,769	49.9%
Decile 6: 41,300-54,500	26,086	3,726	449	300	200	3,094	59.8%
Decile 7: 54,500-72,700	27,531	5,441	811	400	200	3,642	49.9%
Decile 8: 72,700-99,000	53,317	8,251	1,244	500	200	4,341	50.9%
Decile 9: 99,000-148,700	39,203	14,211	2,961	900	300	5,266	53.0%
90th-95th: 148,700-213,900	73,876	14,769	3,402	1,600	500	3,029	60.9%
95th-99th: 213,900-530,200	230,157	32,561	8,903	3,700	1,100	3,233	64.8%
99th-99.9th: 530,200-2,459,700	327,887	31,729	11,618	16,600	2,000	1,019	62.2%
Above 99.9th: 2,459,700-	253,364	35,614	13,177	129,100	12,500	133	73.7%
Total	1,090,278	151,399	43,126	2,300	200	40,732	42.3%

Notes: This table presents estimates of Section 199A tax savings by AGI bin, using the 2018 Sample. See discussion in Section II for our sample and variable definitions. Sample weights are used for all tabulations. AGI cutoff points are rounded to the nearest hundred, as are the mean and median nonzero savings amounts. We use individuals' reported deduction amounts to estimate tax savings. The underlying data are derived from administrative records of individual tax returns and information returns processed by the Internal Revenue Service.

Table 3: New 2018 Contractor 199A Claiming

	Probability Claiming 199A							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
New 2018 Primary Contractor	-0.134	-0.021	-0.117	-0.018	-0.078	-0.009	-0.057	-0.007
	(0.004)	(0.003)	(0.004)	(0.003)	(0.006)	(0.004)	(0.006)	(0.004)
New 2018 Any Contractor Income	-0.133	-0.031	-0.124	-0.028	-0.079	-0.018	-0.064	-0.014
	(0.003)	(0.002)	(0.003)	(0.002)	(0.004)	(0.003)	(0.004)	(0.003)
Controls		X		X		X		X
Reference Group	All	All	All	All	2017	2017	2017	2017
Sample	All	All	Below	Below	All	All	Below	Below

Notes: Regressions predict claiming section 199A in 2018. The top row of results represent the difference in claiming behavior between new 2018 primary contractors relative to a reference group of individuals who were primary contractors in both 2017 and 2018. The next row of results represents the difference in claiming between individuals with any contracting income in 2018 who didn't have contracting income before relative to individuals who have contracting income in 2018 and 2017. Standard errors are shown below coefficient estimates. Odd columns have no controls while even columns have controls for contractor income, taxable income, and demographic characteristics. Columns 1-4 use all individuals who were contractors in 2017 and 208 as a reference group, while columns 5-8 limit the reference group to those who were new contractors in 2017 and continued in 2018. Columns 1-2 and 5-6 make no income exclusion while columns 3-4 and 7-8 restrict the sample to individuals with income below the 199A limitations threshold. New primary contractors are those who previously received less than 40 percent, and now receive more than 60 percent, of labor compensation by contracting.

A Estimating and validating SSTB status

In this Appendix, we describe and validate how we classify business owners as SSTB or non-SSTB. To distinguish SSTB vs. non-SSTB owners in year t, we use year $t-1$ data. We first look to the business's reported NAICS code. If this code indicates a service sector industry, we label that business an SSTB. Then, if at least twenty percent of a tax unit's potential QBI comes from SSTB businesses, we label that tax unit an SSTB owner.[42] This inevitably results in some misclassification, as NAICS codes do not map cleanly onto SSTB status, which depends on the facts and circumstances of the business. Moreover, one entity for tax purposes may consist of multiple trades or businesses, some of which may be SSTBs and some of which may not. Since our data are at the tax-entity level, we cannot observe this complexity. This mismeasurement of SSTB status implies that both of our regression frameworks are biased towards null results.

To explore the validity of our SSTB strategy, we examine claiming behavior in 2018 among taxpayers above and below the income threshold by NAICS code of their highest income business. Our sample includes taxpayers with positive potential QBI, and we divide codes into those that are likely to be SSTBs, a few that are more borderline, and a few that are likely to be non-SSTB businesses.[43] Appendix Table A1 shows the ratio of the claimed QBI deduction on Form 1040 to a rough measure of their potential deduction – 20 percent of potential QBI – in the percent claimed column, the total dollars in that industry, and the number of taxpayers in our sample.

For example, consider individuals whose primary source of pass-through income is from NAICS code 523 (securities and other financial investments), the first row in the table. We estimate that approximately 187,000 tax units with this NAICS code with income below the 199A thresholds are claiming QBI deductions of $14 billion, which is 48 percent of their potential deduction. For those individuals whose primary source of pass-through income is from NAICS code 523 but have income above the threshold, we estimate 83,000 tax units claim a deduction of $45 billion, which is 29 percent of their potential deduction. We note that there are multiple reasons this group does not claim a zero deduction. For example, while we have categorized taxpayers into a NAICS code based on their highest income business, it is common for pass-through business owners to own multiple businesses. Pass-through income from other sources may contribute to positive deductions, and more generally to the percent claimed statistic. Another important reason deductions are not zero for the NAICS 523 group above the 199A threshold is that some businesses with this NAICS code may generate non-SSTB income.

With these caveats in mind, the results indicate that, among taxpayers whose highest-income business we classify as SSTB, claiming percentages differ for those above vs. below the 199A thresholds in the predicted way. That is, those above the 199A thresholds generally claim a smaller share of their potential QBI than those below the 199A thresholds. Moreover, among those whose highest income business we classify as non-SSTB, we see that individuals with incomes above the threshold actually claim a *higher* share of their potential QBI. If these businesses were more properly classified as SSTBs, we would expect the opposite. Overall, we take the results of Table A1 to suggest that our SSTB characterization is an imperfect but meaningful signal of ineligibility due to the 199A SSTB limitation.

[42] For SSTB classification purposes, we only consider potential QBI derived from up to four of the tax unit's businesses: the top two Schedule Cs, and the top two K1s from partnerships or S corporations. If a taxpayer lacks these sources of income, we label them a non-SSTB owner. By "top two" we mean the two associated with the largest absolute values of potential QBI.

[43] We stress that this list of NAICS codes is a modeling approximation. Neither the law nor the regulations define SSTB with reference to NAICS codes, but rather, based on the facts and circumstances of each business. Readers should not infer that this list of NAICS codes represents an interpretation by the Department of the Treasury regarding which businesses would be considered SSTBs.

Table A1: 2018 Deduction Amounts by SSTB Status and Income Threshold

Industry	NAICS	Below Threshold			Above Threshold		
		Percent claimed	Dollars (billions)	Number (000s)	Percent claimed	Dollars (billions)	Number (000s)
SSTBs							
Securities, Other Financial Investments	523	48	14	187	29	45	83
Hospitals	622	58	0	4	21	1	2
Nursing and Residential Care Facilities	623	48	4	34	55	1	2
Performing Arts and Related Industries	711	53	9	394	33	11	18
Motion Picture and Video Industries	5121	63	2	42	51	1	2
Legal Services	5411	61	24	231	19	56	74
Accounting, Tax Preparation, Bookkeeping, Payroll	5412	58	12	228	21	12	24
Management, Scientific, and Technical Consulting Services	5416	58	15	240	33	15	49
Offices of Physicians	6211	61	12	113	21	29	94
Offices of Dentists	6212	67	8	65	25	9	26
Offices of Other Health Practitioners	6213	62	13	259	30	5	21
Outpatient Care Centers	6214	53	1	12	29	3	10
Home Health Care Services	6216	32	3	112	52	1	3
Other Ambulatory Health Care Services	6219	50	0	9	29	1	3
Lessors of Nonfinancial Intangible Assets	53311	28	0	5	42	1	1
Veterinary Services	54194	70	2	22	30	1	4
Borderline SSTBs							
Architectural, Engineering Services	5413	65	10	159	73	8	15
Specialized Design Services	5414	59	3	93	54	1	4
Computer Systems Design Services	5415	64	10	165	65	8	15
Non-SSTBs							
Manufacturing	31	60	16	211	82	37	40
Wholesale Trade	42	62	13	199	79	31	38
Construction of Buildings	236	48	17	374	77	12	13
Newspaper, Book Publishers	5111	59	0	9	74	1	1
Restaurants and Eating Places	7225	65	8	140	84	6	13

Notes: Table categorizes taxpayers with positive QBI, as measured by K1 income from partnerships and S corporations, and Schedule C and F income, into a NAICS code based on their highest income business. We divide codes into those that are likely to be SSTBs, a few that might be more borderline, and a few that are likely to be non-SSTB businesses. We stress that this list of NAICS codes is a modeling approximation. Neither the law nor the regulations define SSTB with reference to NAICS codes, but rather, based on the facts and circumstances of each business. Readers should not infer that this list of NAICS codes represents an interpretation by the Department of the Treasury regarding which businesses would be considered SSTBs. Using sample weights to estimate nationally representative figures, we show the ratio of the claimed QBI deduction on Form 1040 to 20% of our calculated QBI measure, the total amount of calculated QBI attributable to that industry among these taxpayers, and the number of taxpayers. We divide taxpayers into those above and below the 199A income threshold.

B Alternative Specifications

In this appendix, we report results under a number of alternative specifications that measure the effects of 199A. None of these alternative specifications yields results that are qualitatively different than the baseline specifications.

Overall effect on pass-through income

As an alternative approach to detecting the overall effect of 199A on pass-through income, we used inverse probability weighting (IPW) to account for underlying differences in the populations between our treated and control groups. Specifically, we run a first-stage probit regression (separately by year) that predicts treatment status based on the following characteristics: marital status (married, single male, or single female); number of child dependents (censored at three); state; a quadratic function of age; one-year lags of indicators for having partnership income, S-corporation income, sole proprietorship income, passive income, and passive losses; lagged decile bins for the outcome variable for each of the past five years; and lagged treatment status proxies (themselves based on prior-year data) for each of the past five years. The resulting treatment propensity, $\hat{T}_{it}$, forms the basis for the inverse propensity weights. The final weight used in the regressions is the inverse propensity weight multiplied by the sample weight (Ridgeway et al., 2015). [44]

In Appendix Figures B1 and B2, we report our results using inverse probability weighting (IPW). The IPW method has only a modest effect on the results; in particular, there remains a substantial (though slightly smaller) pre-existing trend when using SSTB status for identification. Thus, any differences in trends in pass-through income between these groups cannot be explained by simple differences in observable characteristics.

Next, we redo our original analyses and our IPW analyses using an alternative definition of potential QBI that excludes rents and royalties. While rent and royalty income may be eligible for the section 199A deduction, it has to rise to the level of a trade or business. Around 14 percent of our sample have rent and royalty income, so if a large share of this income is not eligible for the deduction, including it in potential QBI could bias us towards finding null results.

Figures B3 and B4 show our baseline difference-in-difference results remain using the alternative income definition. There is no evidence that including ineligible rents and royalties led to a null result. Figures B5 and B6 show our difference in difference results using IPW and excluding rents and royalties from our QBI definition. We find that IPW again does not have much effect on the results, and it does not remove the pre-trend differences between SSTB and non-SSTB business owners.

Wages to shareholders

In this section, we report two alternative specifications that examine the effect of section 199A on wages paid to S corporation shareholders. The main specification compares wages paid to shareholders of single-shareholder firms, who have the easiest ability to make changes to owner compensation, to wages paid to shareholders of multiple-shareholder firms, who face a more complicated problem. One might be concerned that two- and three-shareholder firms might be able to solve any coordination problems required to successfully reduce wages to shareholders while generally holding pre-tax allocations fixed. If this were the case, such firms might also plausibly be "treated," attenuating the results of the baseline

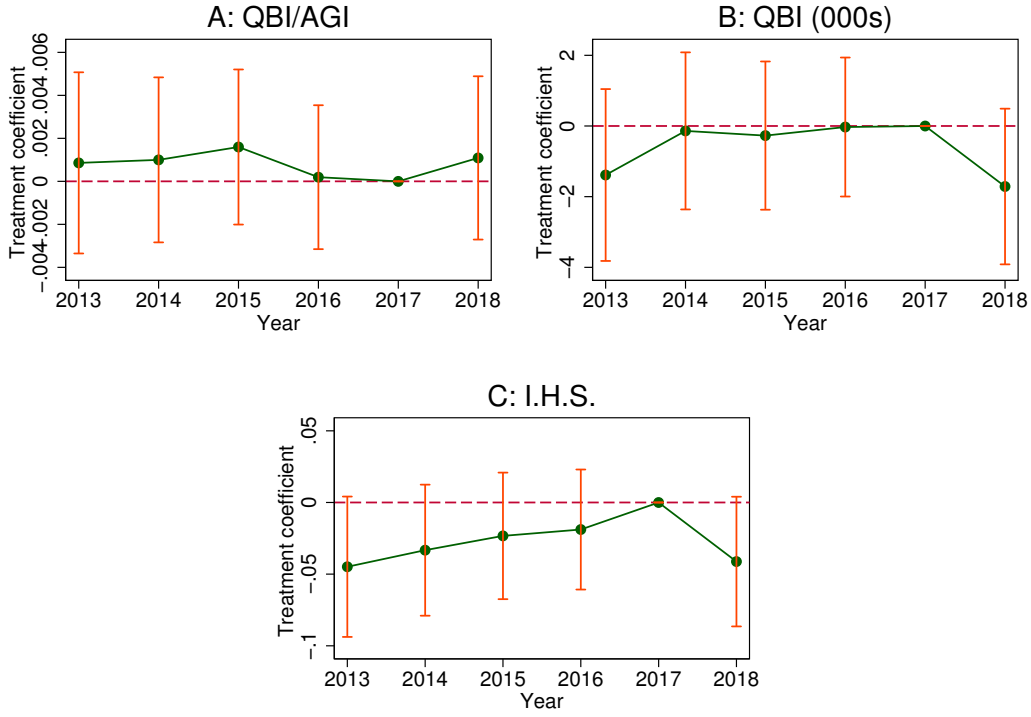
[44] We winsorize the inverse propensity score weights at 60, as suggested by Frolich (2004).

exercise. The time series evidence in Figure 4 suggests this is not the case – or, alternatively, a large positive 2018 fixed effect would be required to explain this result. Nevertheless, Appendix Figures B7 and B8 repeat the above analysis dropping two- and three-shareholder firms, meaning that the comparison is made between single-shareholder firms and firms with at least four shareholders.[45] While the series is a bit noisier, these figures show no evidence any large reduction in wages to owners of single-shareholder firms.

Additionally, it is feasible to use SSTB status for identification. Among owners above the income threshold, SSTB owners did not face the additional incentive to reduce wages, while non-SSTB owners did. In Appendix Figures B9 and B10, we trace the change in wages for the treatment (non-SSTB) and control (SSTB) S corporations, restricting to single-owner shareholders who were above the income threshold in $t-1$. Given the sample restrictions, the estimates are slightly noisier than the main specifications, but remain consistent with a null effect.

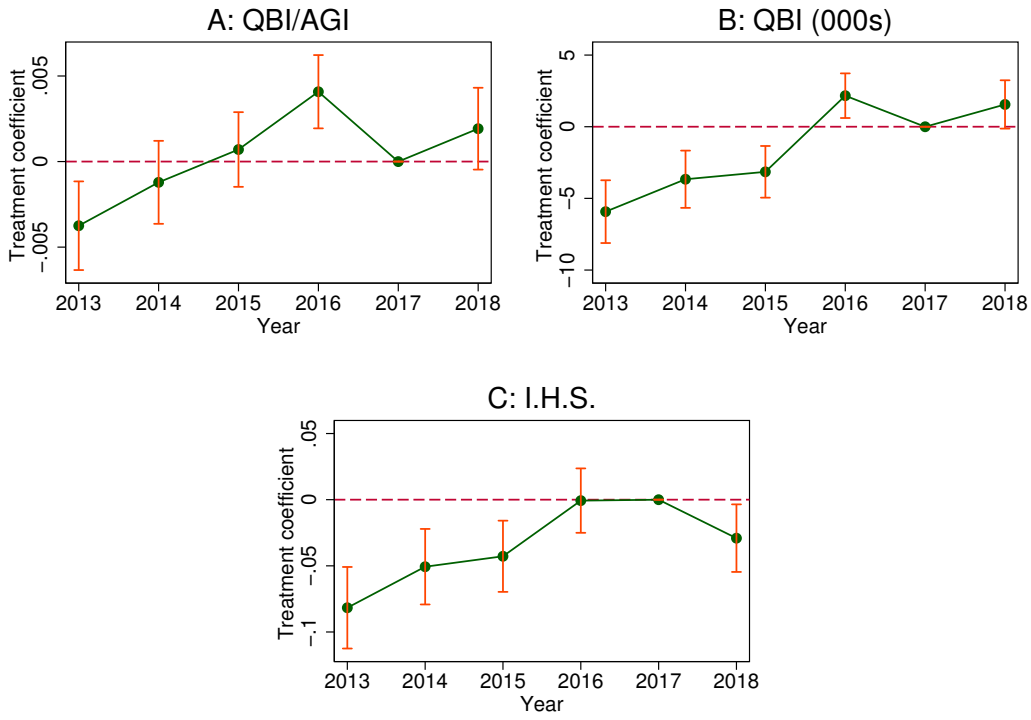
[45] We estimate that 75% of firms with at least four shareholders, with positive wages to at least one shareholder, also paid zero wages to at least one shareholder.

Figure B1: Difference-in-differences: comparing those above and below income thresholds, using IPW



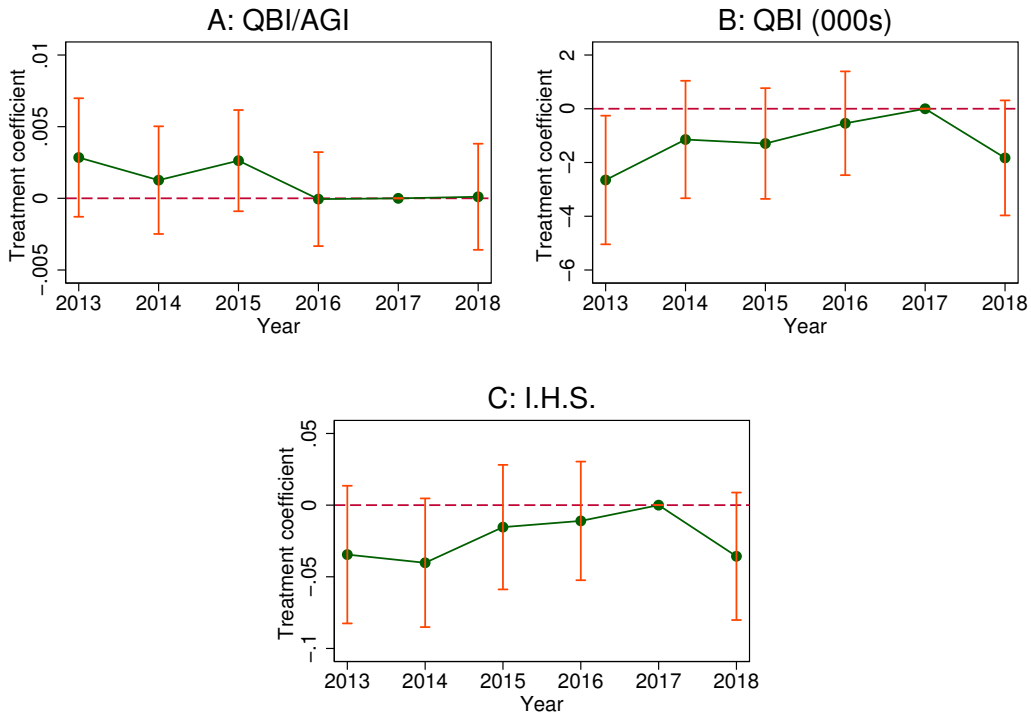
Notes: This figure presents regression estimates of the year-specific treatment effects (γ_t) in equation (1), using our Pass-through Owners Sample and IPW as described in Section B. The regression sample is limited to SSTB owners near the 199A thresholds, and treatment is defined as being below the thresholds. In Panel A, the share of AGI attributable to potential QBI as the dependent variable. In Panel B, the dependent variable is a dummy for non-zero potential QBI. In panel C, the dependent variable is potential QBI (in 000s), Winsorized at the 1st and 99th percentiles. In panel D, the dependent variable is the inverse hyperbolic sine of potential QBI (scaled in 000s). Here potential QBI is the sum of profits/losses from sole proprietorships, partnerships, S-corporations, Schedule F income, and Schedule E rents and royalties. See Sections III.A and B for further regression details. All panels were created by the authors using data from the population of tax returns.

Figure B2: Difference-in-differences: comparing SSTB and non-SSTB owners, using IPW



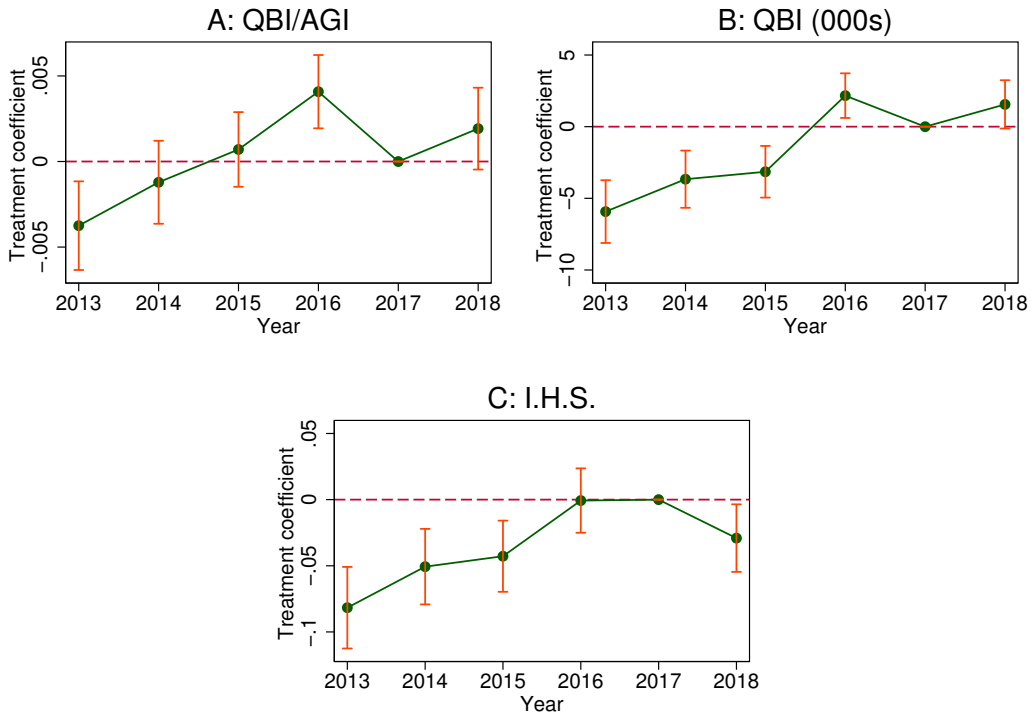
Notes: This figure presents regression estimates of the year-specific treatment effects (γ_t) in equation (1), using our Pass-through Owners Sample. The regression sample is limited to taxpayers above the 199A thresholds, and treatment is defined as being a non-SSTB owner. In Panel A, the share of AGI attributable to potential QBI as the dependent variable. In Panel B, the dependent variable is a dummy for non-zero potential QBI. In panel C, the dependent variable is potential QBI (in 000s), Winsorized at the 1st and 99th percentiles. In panel D, the dependent variable is the inverse hyperbolic sine of potential QBI (scaled in 000s). Here potential QBI is the sum of profits/losses from sole proprietorships, partnerships, S-corporations, Schedule F income, and Schedule E rents and royalties. See Section III.A for further regression details. All panels were created by the authors using data from the population of tax returns.

Figure B3: Difference-in-differences: comparing those above and below income thresholds, excluding rents and royalties



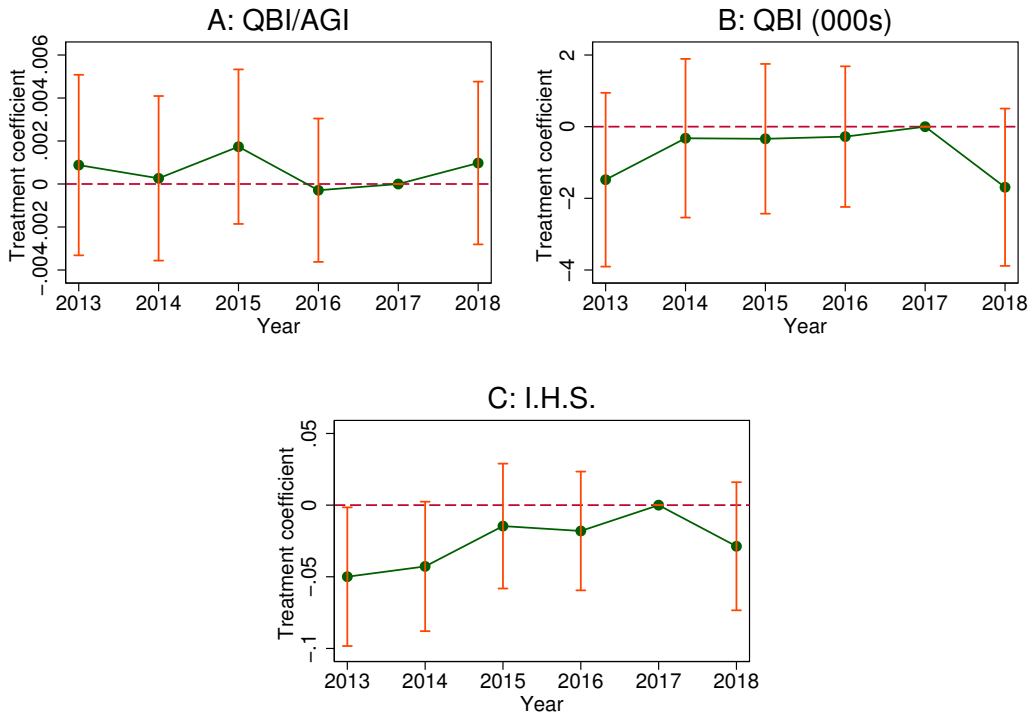
Notes: This figure presents regression estimates of the year-specific treatment effects (γ_t) in equation (1), using our Pass-through Owners Sample. The regression sample is limited to SSTB owners near the 199A thresholds, and treatment is defined as being below the thresholds. In Panel A, the share of AGI attributable to potential QBI as the dependent variable. In Panel B, the dependent variable is a dummy for non-zero potential QBI. In panel C, the dependent variable is potential QBI (in 000s), Winsorized at the 1st and 99th percentiles. In panel D, the dependent variable is the inverse hyperbolic sine of potential QBI (scaled in 000s). Here potential QBI is the sum of profits/losses from sole proprietorships, partnerships, S-corporations, and Schedule F income. See Sections III.A and B for further regression details. All panels were created by the authors using data from the population of tax returns.

Figure B4: Difference-in-differences: comparing SSTB and non-SSTB owners, excluding rents and royalties



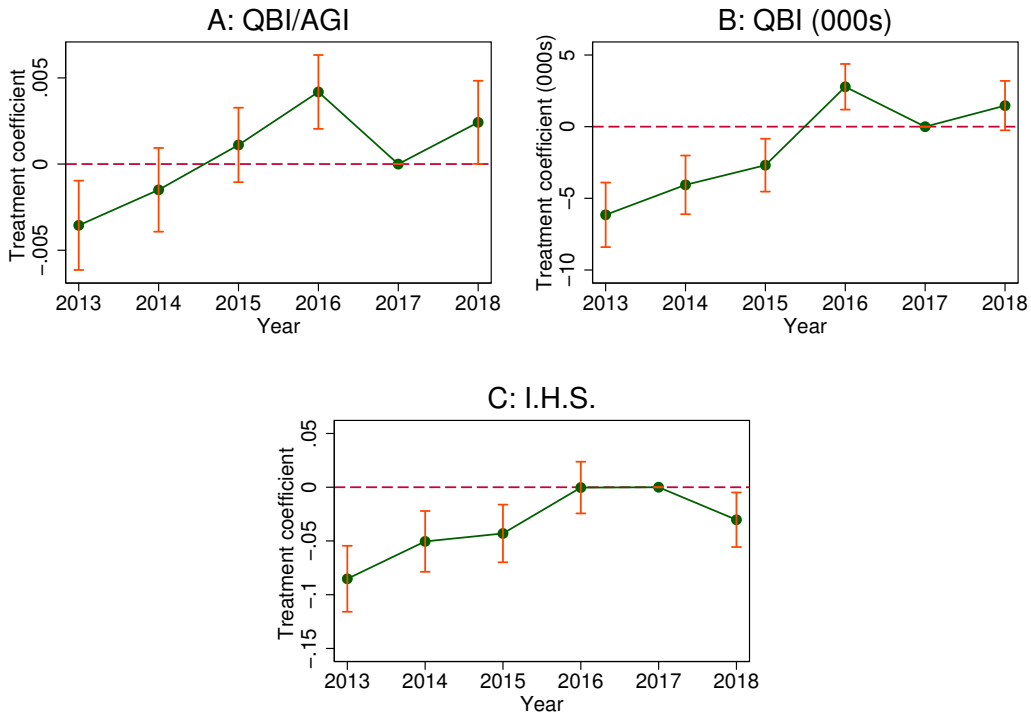
Notes: This figure presents regression estimates of the year-specific treatment effects (γ_t) in equation (1), using our Pass-through Owners Sample. The regression sample is limited to taxpayers above the 199A thresholds, and treatment is defined as being a non-SSTB owner. In Panel A, the share of AGI attributable to potential QBI as the dependent variable. In Panel B, the dependent variable is a dummy for non-zero potential QBI. In panel C, the dependent variable is potential QBI (in 000s), Winsorized at the 1st and 99th percentiles. In panel D, the dependent variable is the inverse hyperbolic sine of potential QBI (scaled in 000s). Here potential QBI is the sum of profits/losses from sole proprietorships, partnerships, S-corporations, and Schedule F income. See Section III.A for further regression details. All panels were created by the authors using data from the population of tax returns.

Figure B5: Difference-in-differences: comparing those above and below income thresholds, using IPW, excluding rents and royalties



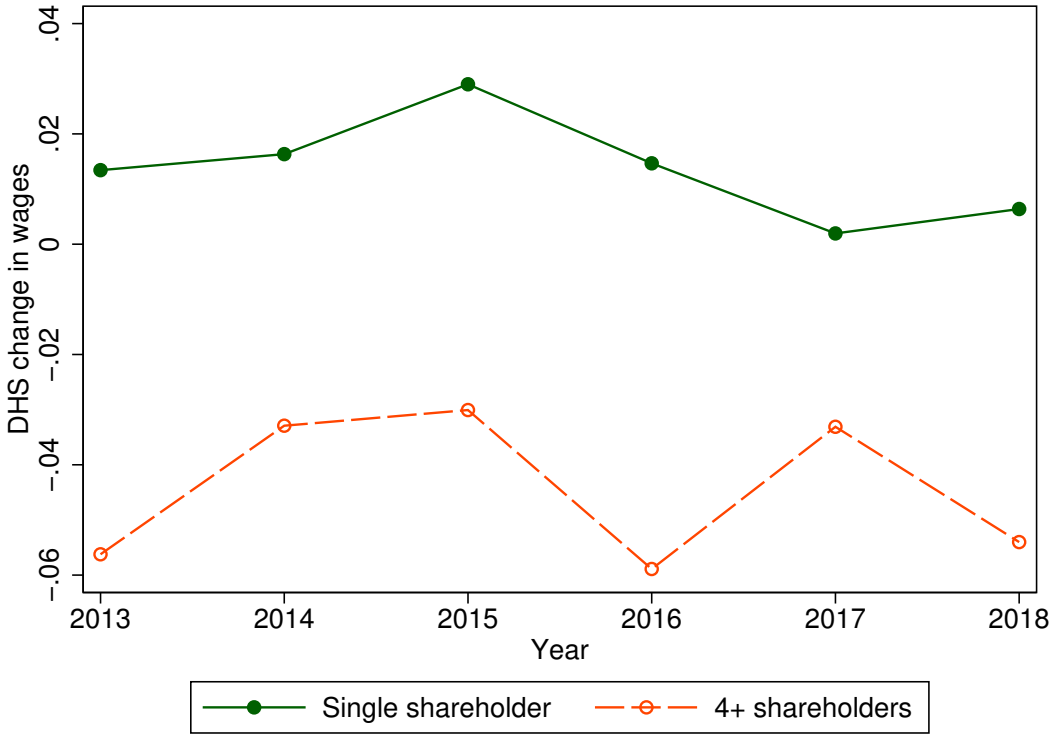
Notes: This figure presents regression estimates of the year-specific treatment effects (γ_t) in equation (1), using our Pass-through Owners Sample and IPW as described in Section B. The regression sample is limited to SSTB owners near the 199A thresholds, and treatment is defined as being below the thresholds. In Panel A, the share of AGI attributable to potential QBI as the dependent variable. In Panel B, the dependent variable is a dummy for non-zero potential QBI. In panel C, the dependent variable is potential QBI (in 000s), Winsorized at the 1st and 99th percentiles. In panel D, the dependent variable is the inverse hyperbolic sine of potential QBI (scaled in 000s). Here potential QBI is the sum of profits/losses from sole proprietorships, partnerships, S-corporations, and Schedule F income. See Sections III.A and B for further regression details. All panels were created by the authors using data from the population of tax returns.

Figure B6: Difference-in-differences: comparing SSTB and non-SSTB owners, using IPW, excluding rents and royalties



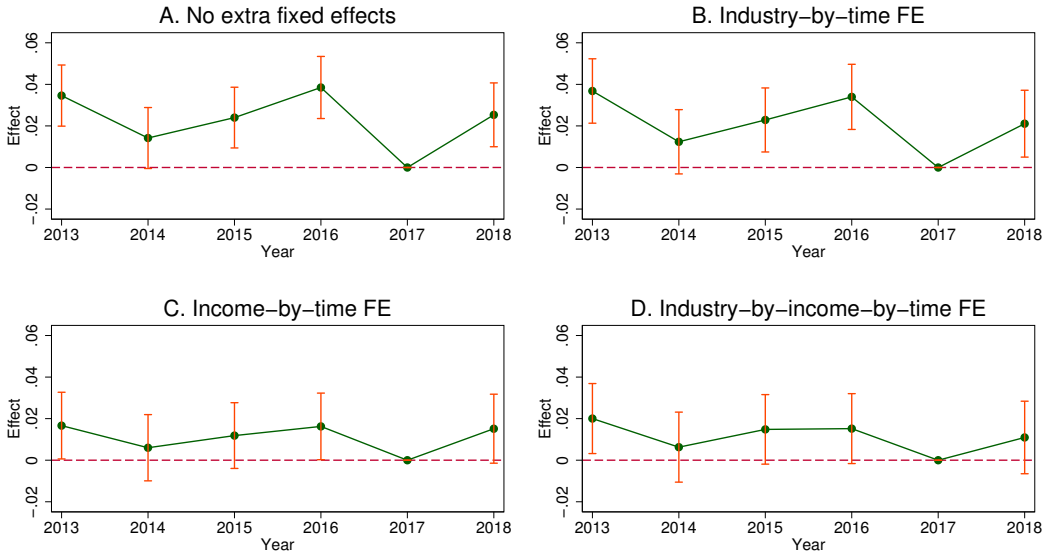
Notes: This figure presents regression estimates of the year-specific treatment effects (γ_t) in equation (1), using our Pass-through Owners Sample and IPW as described in Section B. The regression sample is limited to taxpayers above the 199A thresholds, and treatment is defined as being a non-SSTB owner. In Panel A, the share of AGI attributable to potential QBI as the dependent variable. In Panel B, the dependent variable is a dummy for non-zero potential QBI. In panel C, the dependent variable is potential QBI (in 000s), Winsorized at the 1st and 99th percentiles. In panel D, the dependent variable is the inverse hyperbolic sine of potential QBI (scaled in 000s). Here potential QBI is the sum of profits/losses from sole proprietorships, partnerships, S-corporations, and Schedule F income. See Section III.A for further regression details. All panels were created by the authors using data from the population of tax returns.

Figure B7: Raw wages to shareholders: dropping 2-3 shareholder firms



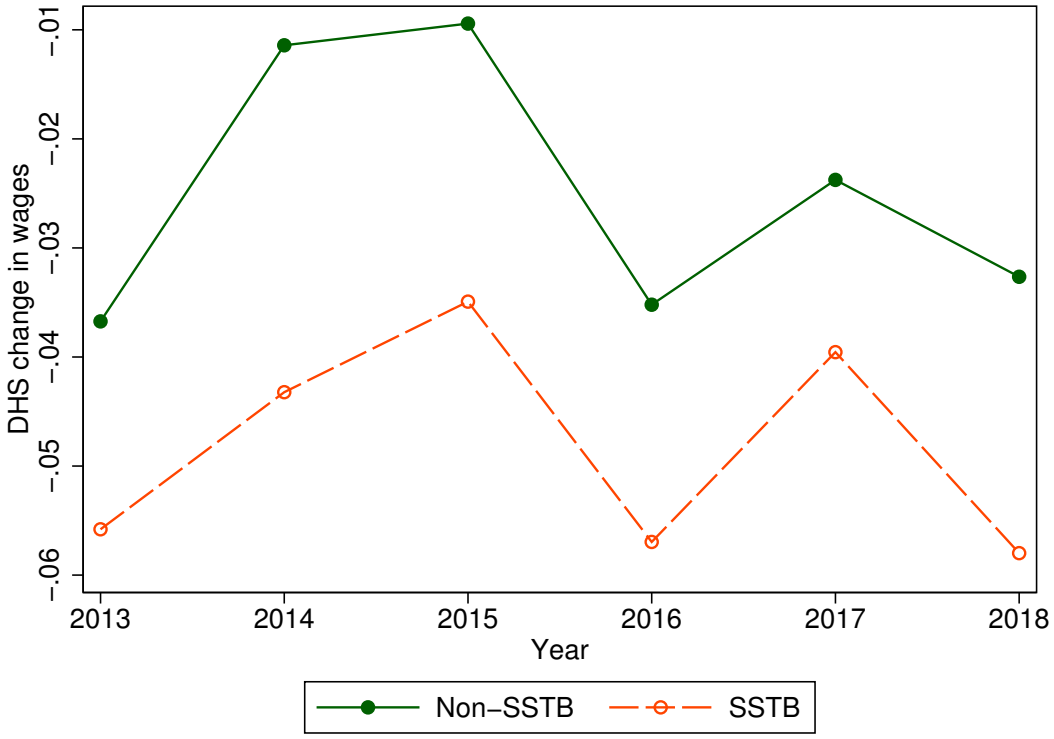
Notes: Using the S Corporation Sample, this figure plots the average DHS difference in wages to shareholders, separately by single- and multiple-shareholder S corporations, except that S corporations with two or three shareholders are dropped. See also the notes to Figure 4.

Figure B8: Wages to shareholders: Event study, dropping 2-3 shareholder firms



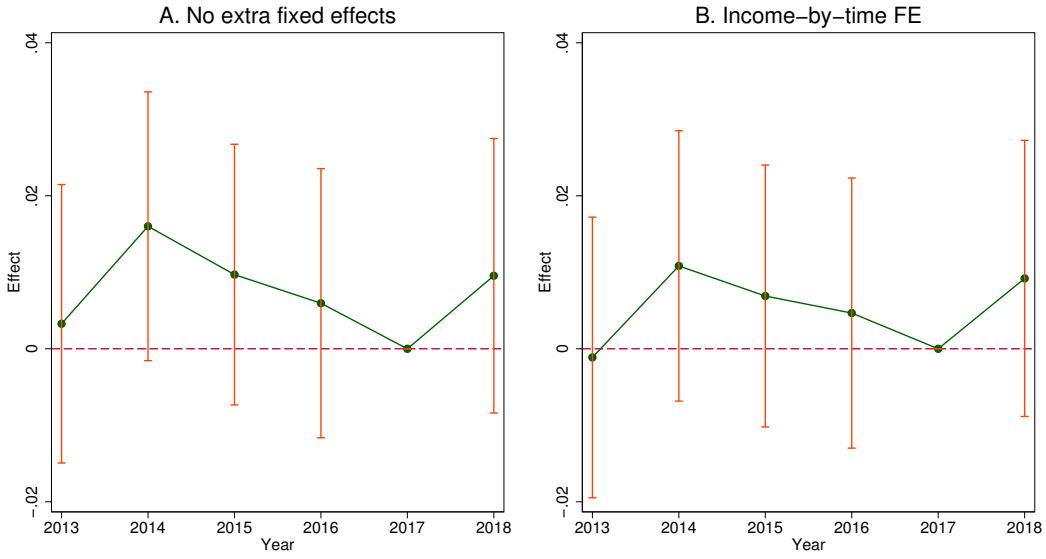
Notes: This figure is analogous to Figure 5, except that S corporations with two or three shareholders are dropped.

Figure B9: Raw wages to shareholders: using SSTB status for identification.



Notes: Using the S Corporation Sample, this figure plots the average DHS difference in wages to shareholders, separately by SSTBs and non-SSTBs. The sample is restricted to firms with a single shareholder, where the owner was above the income thresholds in $t-1$. See also the notes to Figure 4.

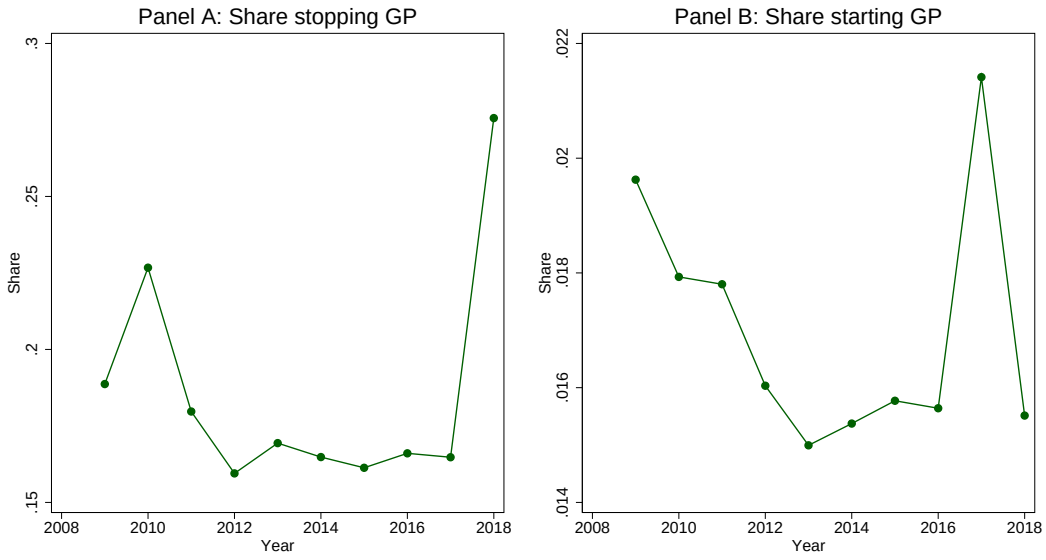
Figure B10: Wages to shareholders: Event study, using SSTB status for identification.



Notes: This figure plots the event study associated with the sample in Figure B9.

Appendix C: Additional Figures and Tables

Figure C1: Starting and stopping guaranteed payments



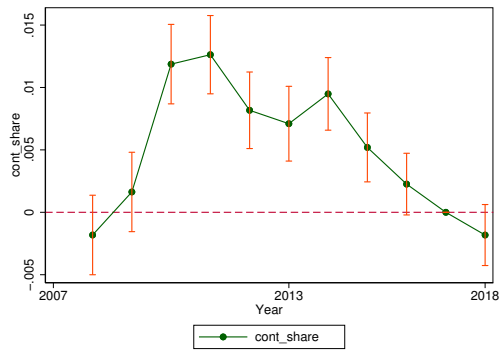
Notes: This figure uses the Pass-through Owner Sample, restricted to those who are partners in a partnership at both t and $t-1$. The left panel plots the probability of not receiving a guaranteed payment in t, conditional on receiving a guaranteed payment in $t-1$. The right panel plots the probability of receiving a guaranteed payment in t conditional on not receiving a guaranteed payment in $t-1$.

Table C1: S Corporation Sample: Summary table

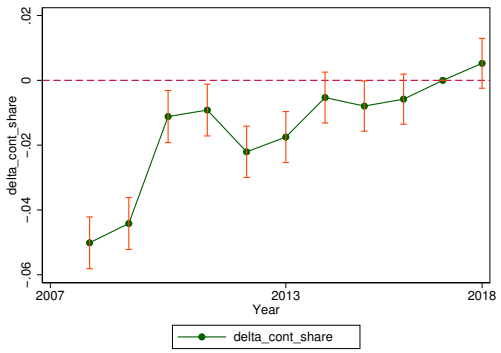
	(1) Mean	(2) Median
Net income	115,713	10,691
Tangible investment	43,197	0
Wages paid to shareholders	54,253	2,690
Any wages to shareholders	0.512	
Number of shareholders	1.605	1
Share single shareholder	0.647	
Share of shareholders above 199A thresholds	0.167	0

Notes: This figure displays summary statistics from the S corporation sample, weighted to be representative of the population of S corporations from 2012 through 2018. "Net income" is ordinary income from Form 1120S. Tangible investment is equal to equipment and structures investment reported on Form 4562. See text for further discussion of sample selection and variable construction. To protect privacy, the reported median is equal to the mean of the 20 observations closest to the true median.

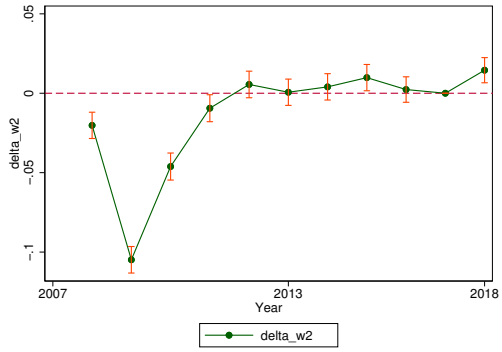
Figure C2: Changes in Compensation Among Contractors



(a) Change in share of contractor income



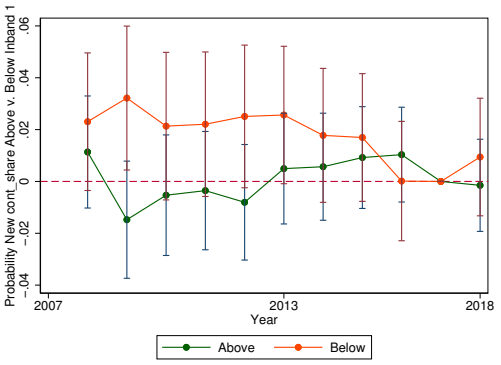
(b) Percentage change in share of contractor income



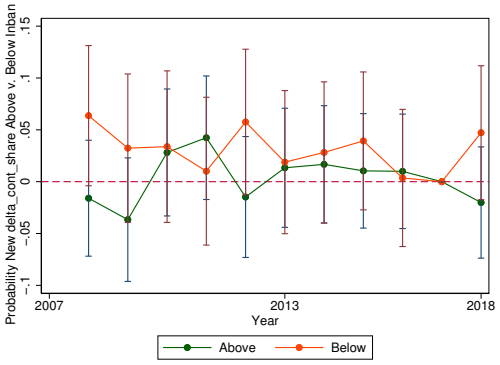
(c) Percentage change in W2 earnings

Notes: Sample represents individuals 25-65 years of age who file a Form 1040 in both that year and the prior year. Panel (a) shows estimates for the share of Form 1099-MISC NEC income relative to 2017 among those with that type of income in the prior year, (b) shows estimates for the percentage change in that share from the prior year among the same group, and (c) shows estimates for the percentage change in Form W-2 earnings from the prior year among those who had both Form W-2 and Form 1099-MISC NEC income in the prior year.

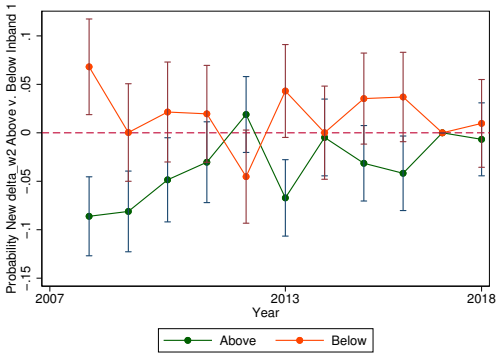
Figure C3: Diff in Diff Changes in Compensation Among Contractors



(a) Diff in diff Change in share of contractor income



(b) Diff in diff Percentage change in share of contractor income



(c) Diff in diff Percentage change in W2 earnings

Notes: Difference in difference estimates comparing individuals with taxable income in the prior year placing them between 50% and 200% of the income threshold. Sample represents individuals 25-65 years of age who file a Form 1040 in both the current and prior tax year. Panel (a) shows estimates for changes in the share of labor income from Form 1099-MISC NEC among those who received NEC income the prior year, (b) shows estimates for the percentage change in the share of labor income from Form 1099-MISC NEC among those who received NEC income the prior year, and (c) shows estimates for the percentage change in Form W-2 compensation among those who received both types of income the prior year.