How Do Business Owners Respond to a Tax Cut?
Examining the 199A Deduction for Pass-through Firms

We measure the short-run responses of businesses and their owners to Section 199A, a deduction that reduced the effective tax rate on most U.S. pass-through business income beginning in 2018. We study taxpayer behavior using de-identified tax records of individuals and businesses. With some notable exceptions, we find neither strong evidence of tax avoidance behavior nor evidence of positive real economic effects. We do not find an increase in 2018 or 2019 business income eligible for the deduction, either in the time series or from comparisons of taxpayers with exogenously differing levels of exposure to the deduction. We examine specific hypothesized margins of adjustment. Partnerships reduce compensation paid to owners, in line with the incentives created by 199A, but S corporations do not. In contrast to fears expressed about the legislation, 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 non-owners, though this analysis is underpowered in the short-run. (*JEL* H24, H25, H26)

Lucas Goodman[*]
Office of Tax Analysis,
U.S. Department of the Treasury
1500 Pennsylvania Avenue NW
Washington, DC 20220
lucas.goodman@treasury.gov

Katherine Lim[*]

U.S. Department of Agriculture,

Economic Research Service

katherine.lim@usda.gov

Bruce Sacerdote[*]
Department of Economics
Dartmouth College
6106 Rockefeller
Hanover, NH 03755
bruce.i.sacerdote@dartmouth.edu

Andrew Whitten[*]
Office of Tax Analysis,
U.S. Department of the Treasury
1500 Pennsylvania Avenue NW
Washington, DC 20220
andrew.whitten@treasury.gov

In 2019, over 22 million individual taxpayers directly benefited from section 199A, a new deduction created by the Tax Cuts and Jobs Act (TCJA) (Internal Revenue Service, 2021). Section 199A generally allows a deduction for 20% of "pass-through" income, a category that comprises the vast majority of income from the self-employed and small to mid-sized businesses as well as an increasing share of income from larger businesses. The deductions are concentrated among high earners: over two-thirds of 199A deductions were claimed by taxpayers with more than $200,000 in adjusted gross income (AGI), and over one-third were claimed by taxpayers with more than $1,000,000 in AGI (Internal Revenue Service, 2021).

In this paper, we estimate individual and business behavioral responses to section 199A using administrative tax data through tax year 2019. We analyze the total effect of the deduction on reported pass-through income as well as specific margins across which taxpayers can potentially convert non-qualifying income into qualifying income. With some exceptions, we broadly do not find evidence of large responses to the 199A deduction. 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 (Duke, 2018; Kamin et al., 2019; Kleinbard, 2019). 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 qualifying income by between two to seven percentage points, with larger cuts for higher-income taxpayers. However, at least in the first two years 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 individual income of a sort that would be eligible for the deduction if statutory requirements are met; we term this income "potential qualifying business income," or "potential QBI" for short.[1] 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).[2] This limitation allows us to construct two comparison groups 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.[3]

We estimate that exposure to 199A leads to virtually no change in the share of an owner's income

---

[1] Potential QBI is a subset of pass-through income that excludes income that is always ineligible for 199A: guaranteed payments paid by partnerships to partners as well as certain types of income from interest, dividends, and other investment income.

[2] 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.

[3] 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.

that comes from potential QBI, among those who earned some potential QBI in recent years. Exploiting the income thresholds for identification, we can rule out an increase in the ratio of potential QBI to adjusted gross income (AGI) in excess of 0.7 percentage points, relative to a baseline mean of 41 percent in this sample. Exploiting SSTB status for identification improves precision; we are able to rule out an increase in excess of 0.4 percent relative to a baseline mean of 32 percent.

Second, we test for changes in the way business income is distributed. Partnerships and S corporations have some ability 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.[4] 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 immediately in 2018 by approximately 30% and stayed low in 2019. Additionally, we find that wages to shareholders *increased* in 2018 among the small subset of S corporations for whom the limitations in section 199A incentivized this. One explanation for these divergent results is that while legal constraints may prevent S corporation owners from reducing wages, no such constraints apply to increasing S corporation owners' wages or reducing partners' guaranteed payments.

Next, we test whether 199A increased contractor work relative to wage employment. Using a number of approaches, we do not find any evidence that 199A has led to increased contracting. 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 (Duke, 2018). First, we look at the universe of workers each year who change status within the same firm. 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.[5] When we use a difference-in-differences strategy to compare workers above and below the 199A income threshold, we see no evidence that those below the threshold were more likely to become contractors. 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). Using entity-level S corporation data, we compare SSTBs with majority ownership below vs. above the 199A income threshold in difference-in-differences regressions. We

---

[4]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.

[5]Due to data limitations related to COVID-19 processing delays, we are unable to perform most of this analysis in 2019.

test for the effect of exposure to Section 199A on tangible investment, the number of non-shareholder employees, and the total non-shareholder wage bill. Our point estimates for each of these three outcomes 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 years it was available.

Our analyses relate 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 both real economic activity and 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).[6]

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 the first two years that the policy was in effect. 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 stream. Nonetheless, this is a margin with fewer adjustment

---

[6]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.

frictions. Responses along some of the margins with greater frictions may increase after more time has passed for owners to respond to the new tax incentives; however, the COVID-19 pandemic will complicate any further analysis of longer-term outcomes. Finally, behavioral responses to the policy may have been muted by the temporary nature of the deduction, which is set to expire after 2025.

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.[7] Businesses can be divided into two categories based on their tax treatment: 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. Despite this disadvantage, the share of business activity occurring in pass-through entities has steadily increased since the Tax Reform Act of 1986 (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 we estimate that 39.5 million individual tax units reported pass-through income in 2019.

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 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

---

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

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" (hereafter TCJA) 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.[8] 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 eligibility for the 199A deduction based on taxpayer income and business type. 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 limitations.[9] 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.[10] The second is that 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 paid by the business, or the sum of 25 percent of the owner's share of the W-2 wages paid by the business plus 2.5 percent of the owner's share of the tangible capital of the firm.[11]

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 ordinary taxable income, meaning that taxpayers with little or no ordinary taxable income may not receive much tax savings from the 199A deduction.[12] In addition, owners of multiple businesses must

---

[8]Section 199A replaces former Section 199, which provided the Domestic Production Activities Deduction for domestically produced goods. 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.

[9]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.

[10]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".

[11]"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.

[12]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.

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.[13]

The Internal Revenue Service (2021) has published statistics on the characteristics of taxpayers who claimed section 199A deductions in its first year. They report that 22.2 million tax units claimed a total of $149.7 billion in section 199A deductions in 2019. Furthermore, the IRS tabulations reveal that the deduction is strongly concentrated among high-income individuals. Over 36% of the deduction was claimed in 2019 by those with AGI in excess of $1,000,000; an additional 34% was claimed by those with AGI between $200,000 and $1,000,000. While most of the dollars are claimed by high-income individuals, most of the claimants are located further down the income distribution. Approximately 27 percent of those claiming section 199A had under $50,000 in AGI; another 27 percent had AGI between $50,000 and $100,000; and a further 27 percent had AGI between $100,000 and $200,000.

II   Data

Our analyses rely on four samples: three representative samples of U.S. taxpayers and businesses as well as a complete sample of workers who changed their worker classification with the same EIN payer. We need multiple datasets 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 in Appendix C.

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 and 2019. In order to maximize power given the nature of the quasi-experimental variation, we oversample taxpayers with high-income.[14] 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 2008-2019. We compile information from individuals' tax returns and information returns for tax years 2008 through 2019 during which these individuals are between the ages 18 and 90.[15] 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,

---

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

[14]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.

[15]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.

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 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; nearly 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 in income levels across our sample is quite large due to the skewed nature of business income.

Forty-three percent 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, and ordinary business income reported on the individuals' Schedule K-1 information returns filed by partnerships and S corporations.[16] 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.

II.B Individual Tax Filer Sample

Our second 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 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 2019. 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 over 19 million person-year observations.

Our measure of contractor earnings comes from non-employee compensation reported on Form 1099-MISC. Due to COVID-19-related processing delays, the database containing Form 1099-MISC is substantially incomplete for tax year 2019. For this reason, our analysis of contractor transitions focuses on 2018 transitions with the exception of contractor transitions measured by new Schedule C filers, which we extend to 2019.

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.[17] As shown in Table 1, around 82

---

[16]We exclude Schedule E rents and royalties, because even for taxpayers with incomes below the 199A thresholds, we find that less than half of this income is claimed as QBI on tax returns. In some specifications reported in Appendix B.1, we report results using an alternative measure of potential QBI that includes Schedule E rental real estate income and royalties.

[17]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 reporting behavior of the issuing firm.

percent of observations have labor income; 79 percent have W-2 earnings and nine percent have Form 1099-MISC earnings. The average wage earnings are \$40,570 while the average contractor earnings are \$2,125. 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.C   Reclassified Worker Sample

Our third dataset focuses on workers who change their form of compensation at the same firm (as proxied by EIN) 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 EIN in any of years $t-1$, t, or $t+1$. Because 2019 does not appear to have full coverage of Form 1099-MISC filings in our data, here we focus on years $t \leq 2018$.

The Reclassified Worker Sample covers 2007 through 2018 and has over 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.[18] Average wage and contractor earnings are \$33,588 and \$9,861, respectively.

II.D   S Corporation Sample

Our fourth and final sample is a panel of S corporations from 2012 to 2019 (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.[19] 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.[20]

Appendix Table C1 reports summary statistics for this sample. Mean net income (in 2018 dollars) is \$114,000, while median net income is \$11,000. Additionally, while mean wages to shareholders are in excess of \$54,000, 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.

---

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

[19]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.

[20]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.

III Empirical Strategy and Results

We now turn to 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 potential QBI, which exhibits a relatively constant trend from 2010 to 2019. The remaining series in Figure 1 plot the count of owners with potential QBI 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 variation, there are no large trend breaks in 2018 and the upward trend may have even reversed in 2019. 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 and 2019 relative to 2017. 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 types of treatment and control groups. Using $t-2$ taxpayer characteristics, we place taxpayers into four groups: SSTB owner or non-SSTB owner interacted with taxpayer income above or below the limitation threshold.[21] We use lagged information to determine eligibility for the deduction to avoid endogenous selection into eligibility in response to the deduction in 2018 or 2019. Because we measure SSTB status using information from $t-2$, our sample in year t includes only taxpayers receiving non-zero pass-through income in $t-2$. Additionally, we drop owners who switch from non-SSTB to SSTB (or vice versa) during the sample period.[22]

Our first identification strategy compares SSTB owners above to those below the 199A thresholds. In particular, the "treatment" group are SSTB owners with $t-2$ taxable income below the income thresholds, while the "control" group are SSTB owners with $t-2$ taxable income above the income thresholds. To improve the comparability of the treatment and control groups, we restrict to those with $t-2$ taxable income between 70% and 200% of the 199A thresholds.

Our second identification strategy compares taxpayers with non-SSTB businesses (treatment) to taxpayers with SSTB businesses (control) among taxpayers with $t-2$ taxable income above the in-

---

[21] We use the beginning of the phase-out range as the relevant threshold. See Appendix A for details on SSTB status determination.

[22] Because SSTB status is measured as of $t-2$, this restriction would *not* drop an individual who switches from SSTB to non-SSTB in 2018 or later, perhaps in response to the deduction itself.

come thresholds. This approach implicitly assumes that the non-SSTB businesses have sufficient wages and/or capital to qualify 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 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.

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:

$$Y_{it} = \alpha_0 + \alpha_1 Treat_{it} + \sum_{\tau=2013}^{2016} \beta_\tau Treat_{it} + \beta_{2018} Treat_{it} + \beta_{2019} Treat_{it} + \tau_t + \gamma_i + \epsilon_{it}. \quad (1)$$

Here Y_{it} refers to an outcome for taxpayer i in year t (2013-2019). The indicator $Treat_{it}$ is a proxy for 199A eligibility in year t; it equals one if in year $t-2$ either taxable income was below the 199A income thresholds or the taxpayer was a non-SSTB owner. By using lagged characteristics, we avoid endogenous selection into eligibility after TCJA is in effect. 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.[23] The coefficients β_τ capture year-specific differences, with 2017 as the omitted category. Our primary coefficients of interest are β_{2018} and β_{2019}, which estimate the difference in outcomes between the treatment and control groups in 2018 and 2019, relative to their difference in 2017, 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 change in the difference between the average outcomes of the treatment and control groups in 2018 and 2019 once we adjust for the fixed effects, then β_{2018} and β_{2019} capture 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 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 that may be correlated with the outcome variable. To the extent such characteristics are affected by (or merely correlated with) 199A eligibility, including them as controls would bias our treatment effect estimates (Angrist and Pischke, 2008).

Our primary measure of pass-through income 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. One downside of this measure is that it will miss any effect on QBI for taxpayers for whom the entirety of their AGI comes from QBI in all years. We provide additional evidence using our difference-in-difference specification to estimate the effect of 199A on QBI in levels in Appendix B.1, which would take into account changes in behavior among taxpayers with all of their income from QBI, and the results are qualitatively similar, though the parallel trend assumptions appear less likely to be satisfied.

Across both of our identification strategies, 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 QBI as a fraction of AGI. Panel A examines outcomes comparing SSTB owners below versus above the income threshold. We find a null effect of the de-

---

[23]This term is subsumed into the individual fixed effects in the analysis comparing SSTB and non-SSTB owners, as we restrict the sample such that SSTB status is constant within individual. However, it is not subsumed in the specification comparing those above and below the income thresholds, as status relative to the threshold is allowed to switch over time.

duction on the share of AGI that is potential QBI in both 2018 and 2019. The 95-percent confidence interval rules out an increase in excess of 0.7 percentage points in 2018 and 2019 relative to a baseline mean of 41 percent in 2017. 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 into 2018 and 2019.

Next, in Panel B we examine the same outcome but compare non-SSTB owners (treated) to SSTB owners (control) where both sets of owners are above the income threshold. We find that pass-through income increased slightly for non-SSTB owners relative to SSTB owners after TCJA. However, this increase is insignificant and economically small. In fact, the increased precision in this specification allows us to tighten the upper bound effect of TCJA: based on the top of the 95% confidence interval we can rule out increases of 0.4 percentage points relative to a baseline mean of 32 percent.

In Appendix B.1, we provide robustness along two dimensions. First, we show that the results are nearly identical when we define potential QBI to include Schedule E rental and royalty income. Second, we show that the results are qualitatively similar using alternative outcomes to measure pass-through income.

Overall, we find no evidence that section 199A increased pass-through income in 2018 and 2019. The time series evidence shows no measurable increase, while our difference-in-differences approach reveals economically small and statistically insignificant effects for 2018 and 2019.

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 responses along some of these margins. We begin with changes in compensation type 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 ineligible 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 Form W-2 wages. In general, because wages are subject to FICA while the profits of S corporations are not, owners face a tax wedge (predating TCJA) in favor of profits.[24] 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.

---

[24]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.

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 by less than one dollar. Thus, one would expect a larger response, all else equal, by single-shareholder firms.[25]

In Figure 3 Panel A we display the percentage change in real wages paid to shareholders for both single shareholder and multiple shareholder firms from 2014 to 2019, where the number of shareholders is measured with a two-year lag, to avoid endogenous selection.[26] For each firm i, we calculate w_{it}, the total 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 $w_{i,t-1}$ is zero. In the aggregate time series, we see no clear reduction in shareholder wages in 2018 or 2019, relative to the existing trend in falling wages among these firms.[27] Neither single- nor multi-shareholder firms' wages fall by substantially more in 2018 or 2019 than they did in 2017.

In panel B, we compare single- and multi-shareholder S corporation behavior more formally in a difference-in-differences regression with firm effects, year effects, and year-by-treatment effects, where 2017 is the omitted category and "treatment" is defined as being a single-owner shareholder. The regression also includes an indicator for treatment status, since a given firm can be single-shareholder in some years and multiple-shareholder in others. The point estimates from the simple specification suggest that wages in single-shareholder firms generally evolved similar to wages in multi-shareholder firms in the pre-treatment period. If 199A decreased owners' wages for single-shareholder firms relative to multi-shareholder firms, we would expect negative point estimates. Instead, the estimate for 2018 is positive, and while the estimate in 2019 is negative, it is statistically insignificant and economically small. While Bull and Burnham (2008) estimates that the pre-existing FICA wedge reduces wages to shareholders by 35 percent, our 95-percent confidence intervals rule out declines larger than 1.2 percent due to 199A.

Next, we study owner compensation in partnerships, which cannot pay their partners Form 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."[28] 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.

To explore the effect of 199A on guaranteed payments to partners, we focus on time series evidence for two reasons. First, the effect is clear in the time series. Second, the baseline levels of guaranteed

---

[25]We estimate that 45% of multiple-shareholder firms with positive wages to at least one shareholder also paid zero wages to at least one shareholder.

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

[27]If we include S corporations that did not exist in $t-2$, then the average DHS difference in shareholder wages in our sample period is no longer negative: 0.001.

[28]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.

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 4 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.[29] This series is fairly stable prior to 2018, with a clear drop of nearly 30 percent in 2018. The decline continued with a drop of nearly 10 percent in 2019 relative to 2018. Thus it does appear that partnerships responded to 199A by reducing (or eliminating) guaranteed payments.

In Figure 5 we present this evidence in a slightly different way. Among individuals who were partners in a partnership in $t-1$ 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 $t-1$). Panel A shows that the share stopping was relatively constant between 2006 and 2017, before a large, nearly ten percentage point increase in 2018 and a four percentage point increase in 2019. Thus there appears to have been a significant response along the extensive margin, with partnerships ceasing guaranteed payments to some partners. Panel B 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. The share starting guaranteed payments remained low in 2018 and 2019, though not lower than the pre-TCJA trend.

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 income must be from a business that is not a SSTB, and the deduction is limited by a function of wages paid (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 individual's only business is a non-SSTB S corporation earning profits of π before paying wages to her (w), and further assume that the firm pays no other wages and has no tangible capital. In that case, the owner's deduction would equal the smaller of $0.2(\pi - w)$ (twenty percent of the net income of the firm) or $0.5w$. Whenever $w < \frac{2}{7}\pi$, the owner can increase her 199A deduction by increasing w.

To study whether owners of firms with such an incentive do in fact increase the firm's wages paid to shareholders, we refine our S corporation sample. Specifically, we restrict to firm-year observations where (1) the firm is a non-SSTB (determined based on $t-2$ reported NAICS code), (2) the firm has only one shareholder (as of $t-2$), and (3) that shareholder was above the bottom of the 199A phase-out threshold in $t-2$. This severe set of restrictions drops 95 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 $t-2$ by at least 50 percent.[30] Roughly 22 percent of observations in this subset are identified as "treated." Firms whose deduction would have been limited, but by less than 50%, are dropped from the regression.

In Figure 6 Panel A, we plot the time path of changes in total wages paid (again measured using the DHS difference) for S Corporations that are owned by taxpayers who are bound (solid line) versus

---

[29]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.

[30]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.

not bound (dashed line) by the wage limitation. There is a large level shift between the two series. Each year, firms whose owners are bound substantially increase wages paid, while firms whose owners are not bound substantially decrease them. This pattern likely reflects mean reversion: those who are bound (not bound) in $t-2$ will tend to be those whose wages to shareholders are temporarily low (high) in $t-2$ and thus will tend to experience an increase (decrease) in the years between $t-2$ and t. Importantly for our identification, however, these lines move mostly in parallel from 2015 through 2017. That is, the mean reversion appears to be roughly constant over the few years prior to TCJA. 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. The difference attenuates a bit in 2019, but wage growth among bound firms was still above its previous trend.

Panel B plots this in event-study form in a manner analogous to Figure 3. Prior to 2017, businesses with and without an owner hypothetically bound by the 199A wage limitation experience similar time trends in wages paid (except perhaps in 2014). Relative to the 2017 difference in wage growth between firms with an owner bound by the limitation versus not bound, in 2018 the difference increases by 8 percent, and the jump is statistically significant. The treatment effect in 2019 is still positive (meaning that wages continued to increase for the treatment group relative to the control group) but the estimate is not 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 set of results is that pass-through business owners may be attentive to both tax incentives and legal constraints. In particular, owners of S corporations may not have reduced their wages in response to 199A because they were already bound 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.

As a check on the internal consistency of our results, it is important to assess whether the behavioral responses uncovered in this section are consistent with our null results on the effect of 199A on business income overall. Around nine percent of partners received guaranteed payments in our Pass-through Owner Sample in 2008-2017 and the total amount of guaranteed payments represented sixteen percent of the total of guaranteed payments and potential partnership QBI. If 30 percent of guaranteed payments shifted to ordinary business income, that would imply a six percent increase in partnership potential QBI. Given that partnership potential QBI amounts to 4.5% of AGI in our Pass-Through Owner Sample in these years, this would translate to only a 0.2 percentage point increase in the QBI share of AGI.

In addition, only 2.4 percent of S corporations, accounting for 6.6 percent of S corporation business income, faced an incentive to increase owner wages. If these firms shifted eight percent of their \$2.64 billion in owner wages to ordinary business income, aggregate S corporation potential QBI would have increased one percent. Given that S corporation potential QBI amounts to 5.5% of AGI in our Pass-Through Owner Sample in 2008-2017, this would translate to only a 0.1 percentage point decrease in the QBI share of AGI. Thus our results do appear to be internally consistent.

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, while wages earned by an employee are ineligible. At the time of the law's passage, some observers speculated that workers and firms might restructure their employment arrangements from employees to contractors to decrease tax liability (Duke, 2018). Prior to 199A, there was already a modest trend towards 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 some platform economy workers receive their compensation, because of inconsistent reporting over time (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 such reclassifications would be substantial, the Section 199A regulations disincentivize them by specifying 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.

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 $t+1$. The 2019 Form 1099-MISCs do not appear to be complete in our data, so we exclude that year. 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.

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. Panel A of Figure 7 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.

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. Because the Schedule C measure does not rely on Form 1099-MISC information, we extend this measure of contractor transitions to 2019.

Trends in our three measures of contractor transitions are shown in Figure 8, 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 line is for transitions into any contractor income. This line shows a steady upward trend from 2008-2017, with the trend continuing uninterrupted into 2018. The aqua line is for transitions into Schedule C filing, which shows a strong upward trend from 2013 through 2017 that continues into 2018 before leveling off in 2019.

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 occurred in 2018 in the 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).[31] 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 a 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.

Our difference-in-differences regressions do not show evidence of a detectable effect of 199A on contractor transitions. Figure 9 plots the estimates from the difference-in-differences regressions predicting the likelihood of becoming a contractor for those below the income threshold relative to those above with 2017 as the reference year. The three panels correspond to our three measures of' transitions: primary contractor (Panel A), any contracting income (Panel B), and Schedule C filing (Panel C). For all three measures, the point estimates are small and statistically insignificant. Moreover, there are larger magnitude estimates in several of the years prior to 2017. 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, in Figure 10 we examine whether individuals who were already receiving contracting income shift their compensation towards contracting. This graphs show time series of several outcomes, with each outcome given relative to its 2017 level. Panel A shows the share of labor income an individual receives from contracting (1099-MISC non-employee compensation), restricting the analysis to individuals who had some contracting income in year $t - 1$. If 2017 contractors shifted their compensation further towards contracting in 2018, we would expect a positive coefficient. However, 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 contracting share of labor income 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 in 2018, 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

---

[31]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.

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 opposite the sign we would expect from 199A incentives.[32]

Finally, we examine whether 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. However, Table 2 shows that new contractors in 2018 are less likely to claim the deduction than existing contractors. This is true among those who become primary contractors in 2018 (the first row) as well as those who start receiving any contractor income that year (the second row), and it remains true after controlling for taxable income, contractor income, and demographic characteristics (columns 2, 4, 6, and 8).[33] We also test whether the predicted positive effect manifests for those with incomes below the 199A threshold in columns 3-4 and 7-8, but the point estimates are similar and negative. Finally we also compare new-2018 to new-2017 contractors (in 2018) rather than all existing contractors in columns 5-8, and we find similar results. Thus individuals who became contractors in 2018 are less likely to claim the deduction, even after 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 reduced the tax rate on business income for certain firms. This rate reduction has an ambiguous effect on incentives for investment. In the standard user cost of capital model (Hall and Jorgenson, 1967; Gravelle, 2014), the firm's break-even rate of return (f_K) on a marginal investment financed by equity (such as retained earnings) 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 (i.e., investors' required return gross of individual-level taxes). Intuitively, the tax rate matters for investment decisions for two reasons: taxes reduce the benefit of investment (by taxing the income stream produced by it),

---

[32]Appendix Figure C1 shows the same outcomes as Figure 10 using our difference-in-differences strategy that compares individuals below the income thresholds to those above. 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.

[33]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 (1, 3, 5, and 7).

while taxes also reduce the cost of investment due to depreciation deductions. When $z < 1$, the former dominates, and a higher tax rate reduces investment.

However, 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. When $z = 1$, theory predicts that the reduction in costs and benefits precisely offset, meaning that the tax rate does not affect a marginal investment. Thus, taking this model literally, we should not expect exposure to section 199A to affect investment in categories of assets eligible for full expensing.

There are several modifications to the standard model that would predict an investment response to a change in the tax rate, though, even when $z = 1$. For example, suppose that the firm incurs $c > 0$ dollars of non-deductible costs (e.g., entrepreneurial effort) for each dollar of investment. In that case, with $z = 1$, the threshold rate of return becomes $\frac{1+c-\tau}{1-\tau} \times (\delta + r)$, which is increasing in τ, implying that a lower tax rate increases investment. Alternatively, if investment is financed by debt, debt-financed investment faces a *subsidy* when interest payments are deductible and $z = 1$. In this scenario, a decrease in the tax rate reduces the subsidy and therefore reduces investment. In sum, theory provides us little guidance even for the expected *sign* of section 199A's effect on investment.

We test for responses in investment, employment, and wages paid 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 86 percent of S corporations that file Form 1120S electronically. Conditional on filing electronically, approximately 45 percent report some investment on Form 4562.

Our analysis compares SSTB firms whose owners are below (treated) or above (control) the section 199A income thresholds.[34] Specifically, among the set of SSTB firms, we define a firm-year observation to be treated if fewer than one-half of its owners were above the section 199A income thresholds in $t - 2$; the remainder of firm-year observations make up the control group.[35] We regress the DHS difference in tangible investment on a treatment indicator, year indicators, and indicators for treatment status interacted with year, with 2017 as the reference year. The results are presented in the Figure 11 Panel A. While there is a modest (and statistically insignificant) upward-sloping pre-trend, we see no evidence of a treatment effect in 2018 or 2019. We can rule out increases in investment in excess of 4 percent or decreases in excess of 2 percent. In Panel B, we interact the year fixed effects with fifty bins of lagged ($t - 2$) business income, defined as ordinary income plus wages to shareholders. This specification is similar in spirit to the specification in Risch (2020): we are comparing businesses that have similar income themselves but whose owners have different amounts of income (i.e., from other sources). In Panels C and D we further add controls for lagged investment and industry. These extra fixed effects and controls have little effect on the results; we still fail to detect an effect on investment. This finding is consistent with the most basic neoclassical model – that investment is independent of the tax rate when $z = 1$. It could also be the case that investment does depend on the tax rate, but too inelastically for us to detect an effect. We cannot distinguish between these hypotheses.

Next, we study the effect of the deduction on wages and employment (other than shareholders) in S

---

[34]Comparing SSTBs to non-SSTBs, among those with high-income owners, leads to 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.

[35]As in earlier specifications in the Pass-Through Owner Sample, we require the firm's SSTB status to be constant between 2012 and 2017.

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 study the number of employees, as measured by the count of Forms W-2 issued to individuals other than shareholders, as well as total wage expenses to non-shareholder employees.[36] As with investment, we use the income of owners relative to the section 199A thresholds for identification. We regress the DHS difference in the number of employees on a treatment indicator, year dummies, and treatment interacted with year, omitting 2017.

Panel A of Figure 12 presents the effect on the DHS percentage change in employment, without any additional fixed effects. In Panel B, we add controls for bins of $t-2$ business income interacted with year, akin to Risch (2020). Panels C and D repeat these same specifications looking at the effect on the DHS percentage change in wages paid. In all specifications, we see relatively flat pre-trends and statistically insignificant coefficients in 2018 and 2019. We caution, however, that the confidence intervals are relatively wide – we are unable to rule out wage or employment effects of two to three percent. These confidence intervals contain the effects detected in Risch (2020), for example.

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, and that our tests are somewhat under-powered, particularly when studying employment. 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 affected the fraction of adjusted gross income that is qualified business income. In our baseline difference-in-differences specifications, we compare taxpayers above versus below the income threshold (all of whom own SSTBs), and we compare taxpayers owning SSTBs with those owning other businesses (all of whom are above the income threshold). In these specifications, we can rule out an increase in the share of income attributable to potential QBI in excess of 0.4 percentage points to 0.7 percentage points.

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 see little evidence of changes in wages paid to owners 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 30 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

---

[36]There will be some measurement error in these definitions, since a firm needs not use the same EIN on the Form W-2 as it does on the 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.

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 responses of businesses and their taxpayers owners to 199A have been modest in the first two years. 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 understand the rules surrounding the deduction.

References

Abraham, Katharine G, John C Haltiwanger, Kristin Sandusky, and James R Spletzer. 2018. "Measuring the Gig Economy: Current Knowledge and Open Issues." National Bureau of Economic Research Working Paper 24950.

Angrist, Joshua D, and Jörn-Steffen Pischke. 2008. *Mostly harmless econometrics.* Princeton university press.

Avi-Yonah, Reuven S. 2018. "The International Provisions of the TCJA: Six Results after Six Months." University of Michigan Law & Economics. Unpublished manuscript.

Barro, Robert J., and Jason Furman. 2018. "Macroeconomic Effects of the 2017 Tax Reform." In *Brookings Papers on Economic Activity*. 257–345.

Bull, Nicholas, and Paul Burnham. 2008. "Taxation of capital and labor: The diverse landscape by entity type." *National Tax Journal*, 397–419.

Collins, Brett, Andrew Garin, Emilie Jackson, Dmitri Koustas, and Mark Payne. 2019. "Is Gig Work Replacing Traditional Employment? Evidence from Two Decades of Tax Returns." Statistics of Income, IRS.

Cooper, Michael, John McClelland, James Pearce, Richard Prisinzano, Joseph Sullivan, Danny Yagan, Owen Zidar, and Eric Zwick. 2016. "Business in the United States: Who Owns It, and How Much Tax Do They Pay?" *Tax Policy and the Economy*, 30(1): 91–128.

Davis, Steve J., John C. Haltiwanger, and Scott Schuh. 1996. *Job Creation and Destruction.* MIT Press.

DeBacker, Jason, Bradley T. Heim, Shanthi P. Ramnath, and Justin M. Ross. 2019. "The impact of state taxes on pass-through businesses: Evidence from the 2012 Kansas income tax reform." *Journal of Public Economics*, 174(C): 53–75.

DeBacker, Jason, Lucas Goodman, Bradley T. Heim, Shanthi P. Ramnath, and Justin M. Ross. 2018. "Pass-Through Entity Responses to Preferential Tax Rates: Evidence on Economic Activity and Owner Compensation in Kansas." *National Tax Journal*, 71(4): 687–706.

Dowd, Tim, Christopher P Giosa, and Thomas Willingham. 2020. "Corporate Behavioral Responses to TCJA for Tax Years 2017-2018." Unpublished manuscript.

Duke, Brendan. 2018. "Pass-Through Deduction in 2017 Tax Law Could Weaken Wages and Workplace Standards." Center on Budget and Policy Priorities.

Goodman, Lucas. 2018. "Shifting by S Corporation Shareholders: Evidence from the 2013 Kansas Tax Reform." Unpublished manuscript.

Goodman, Lucas, Katherine Lim, Bruce Sacerdote, and Andrew Whitten. 2019. "Simulating the 199A Deduction for Pass-through Owners." Office of Tax Analysis Working Paper 118.

Gravelle, Jane G. 2014. "Bonus Depreciation: Economic and Budgetary Issues." Congressional Research Service.

Hall, Robert E., and Dale W. Jorgenson. 1967. "Tax Policy and Investment Behavior." *The American Economic Review*, 57(3): 391–414.

Handwerger, Samuel. 2018. "A Tax Loophole You Could Drive an Uber Through."

Hassett, Kevin A., and R. Glenn Hubbard. 2002. "Tax Policy and Business Investment." In *Handbook of Public Economics, Volume 3.* , ed. Alan J. Auerbach and Martin Feldstein, 1293–1343.

Internal Revenue Service. 2021. "SOI Tax Stats - Individual Statistical Tables by Size of Adjusted Gross Income."

Joint Committee on Taxation. 2019. "Overview of Deduction for Qualified Business Income: Section 199A."

Kamin, David, David Gamage, Ari Glogower, Rebeca Kysar, and Darien Shanske. 2019. "The Games They Will Play: Tax Games, Roadblocks, and Glitches Under the 2017 Tax Legislation." *Minnesota Law Review*, 103: 1439–1520.

Katz, Lawrence, and Alan Krueger. 2019. "Understanding Trends in Alternative Work Arrangements in the United States." *NBER Working Paper 25425*.

Kleinbard, Edward. 2019. "Congress' Worst Tax Idea Ever."

McCloskey, Jessica A. 2018. "The Kansas Tax Experiment: Impact of 2012 Kansas Tax Reform on Output, Employment, & Establishments." Unpublished manuscript.

Oei, Shu-Yi, and Diane M. Ring. 2020. "Is New Code Section 199A Really Going to Turn Us All into Independent Contractors?" Unpublished manuscript.

Pence, Karen M. 2006. "The Role of Wealth Transformations: An Application to Estimating the Effect of Tax Incentives on Saving." *The B.E. Journal of Economic Analysis and Policy*, 5(1): 1–24.

Risch, Max. 2020. "Does Taxing Business Owners Affect Employees? Evidence from a Change in the Top Marginal Tax Rate." Unpublished manuscript.

Saez, Emmanuel. 2004. "Reported Incomes and Marginal Tax Rates, 1960-200: Evidence and Policy Implications." In *Tax Policy and the Economy, Vol. 18*. , ed. James Poterba, 117–173.

Saez, Emmanuel, Joel Slemrod, and Seth H. Giertz. 2012. "The Elasticity of Taxable Income with Respect to Marginal Tax Rates: A Critical Review." *Journal of Economic Literature*, 50(1): 3–50.

Slemrod, Joel. 1992. "Do Taxes Matter? Lessons from the 1980's." *American Economic Review*, 82(2): 250–256.

Slemrod, Joel, and Shlomo Yitzhaki. 2002. "Tax Avoidance, Evasion, and Administration." In *Handbook of Public Economics, Vol. 3*. , ed. Alan J. Auerbach and Martin Feldstein, 1423–1470.

Smith, Matthew, Danny Yagan, Owen Zidar, and Eric Zwick. 2019. "Capitalists in the 21st Century." *The Quarterly Journal of Economics*, 134(4): 1675–1745.

Figures and Tables

Figure 1: Counts of tax units with potential QBI over time, relative to 2017
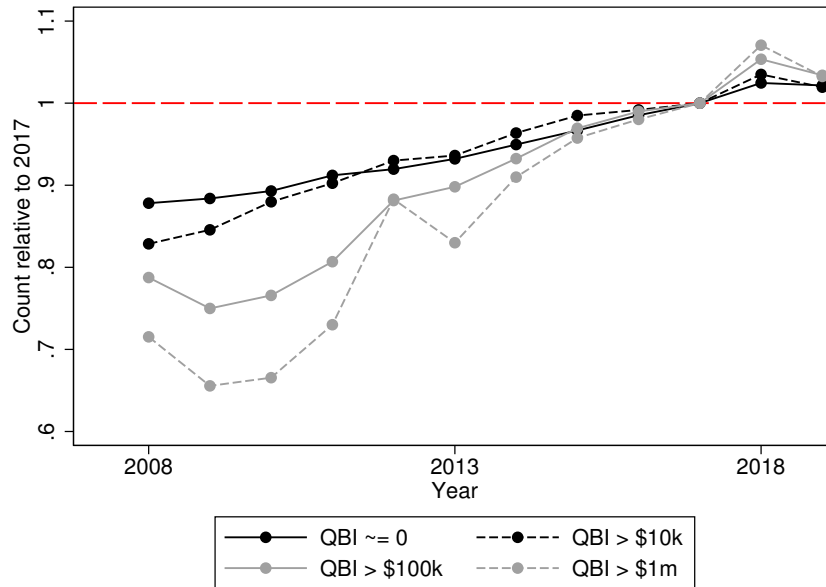
Notes: Using the Pass-through Owners Sample, this figure plots aggregate counts of pass-through owners satisfying various criteria relative to those counts in 2017. The solid black series plots the aggregate counts of those with non-zero potential QBI. The remaining series plots the aggregate counts 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, and Schedule F income. 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: effect of section 199A deduction on QBI scaled by income
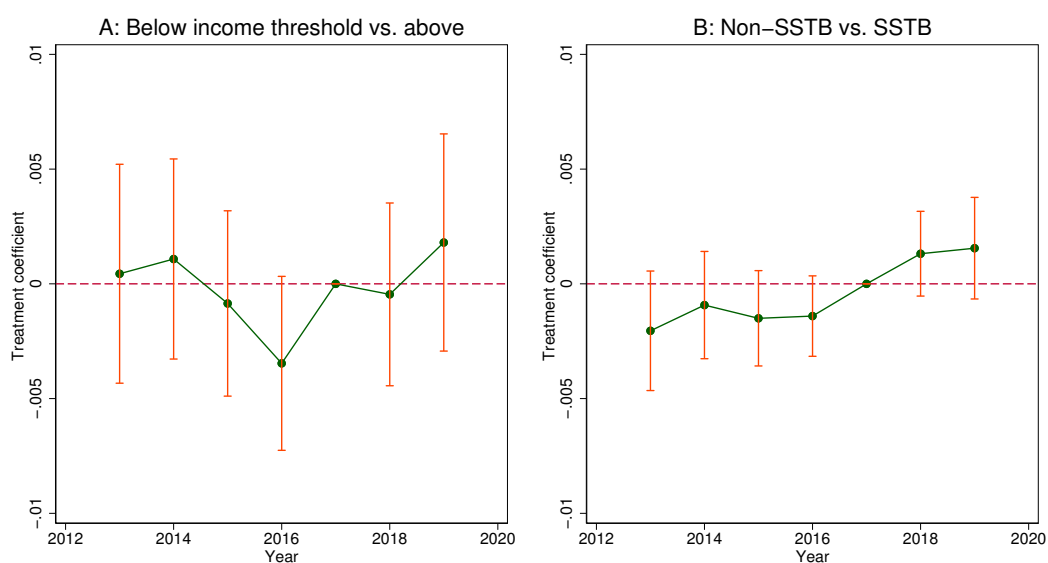

Notes: This figure presents regression estimates of the year-specific treatment effects (γ_t) in equation (1), using our Pass-through Owners Sample. The dependent variable is the ratio of potential QBI to adjusted gross income; this ratio is censored below at zero and above at one. In Panel A, we exploit the income threshold for identification: treatment is defined as having taxable income at time $t-2$ that is below the section 199A income thresholds at which the deduction begins to phase out for SSTB owners. The sample is limited those owners whose $t-2$ taxable income between 70% and 200% of the thresholds. In Panel B, we exploit for identification the fact that SSTB income is not eligible for section 199A for high-income owners: treatment is defined as being a non-SSTB owner. The sample is restricted to those owners whose $t-2$ taxable income is above the section 199A income thresholds. Standard errors are clustered at the firm level. See Section III.A for further regression details. All panels were created by the authors using data from the population of tax returns.
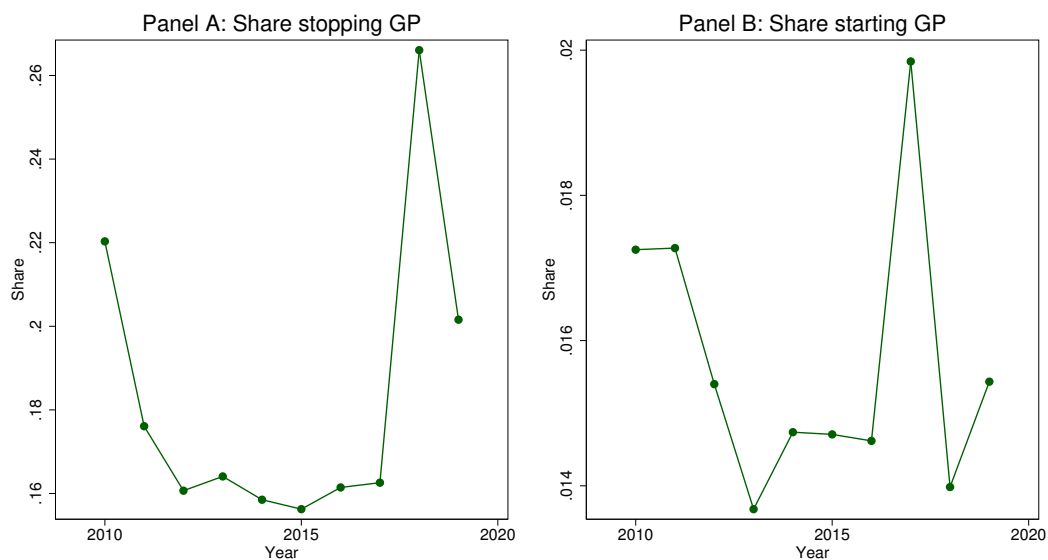
Figure 3: Wages to shareholders of S corporations

Notes: Using the S Corporation Sample, Panel A plots the change in wages paid by S corporations to their shareholders, as measured by the Davis-Haltiwanger-Schuh (DHS) difference, separately by single- and multiple-shareholder S corporations. The DHS difference is defined as $\frac{w_{it} - w_{i,t-1}}{0.5(w_{it} + w_{i,t+1})}$, where w_{it} is wages to shareholders. The number of shareholders is measured as of $t-2$. Panel B plots the associated event study using the same dependent variable – i.e., the coefficients from Equation (1), but starting in 2014 rather than 2013, where treatment is defined as being a single-shareholder firm. Standard errors are clustered at the firm level. All panels were created by the authors using data from the population of tax returns.

Figure 4: Changes in guaranteed payments
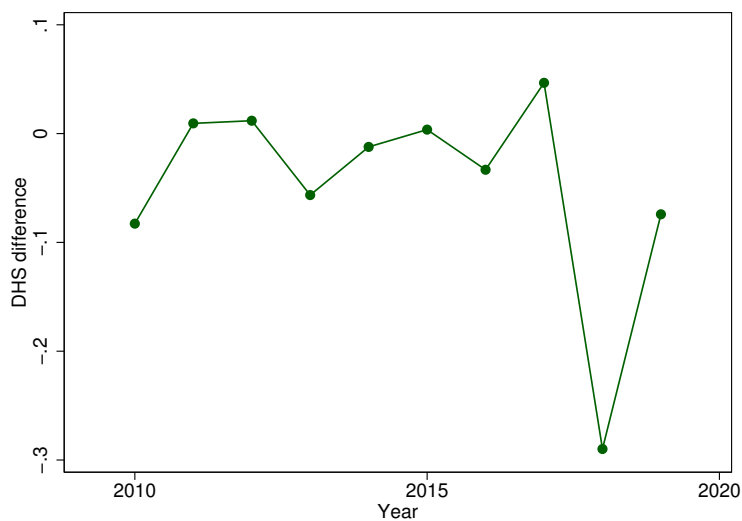
Notes: This figure plots the DHS difference in guaranteed payments to partners, using the Pass-through Owner Sample, restricted to observations who are partners in both $t-1$ and t. The DHS difference is defined as $\frac{w_{it}-w_{i,t-1}}{0.5(w_{it}+w_{i,t+1})}$. All panels were created by the authors using data from the population of tax returns.

Figure 5: 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 $t-1$.

Figure 6: Wages to shareholders: those bound by wage limitation
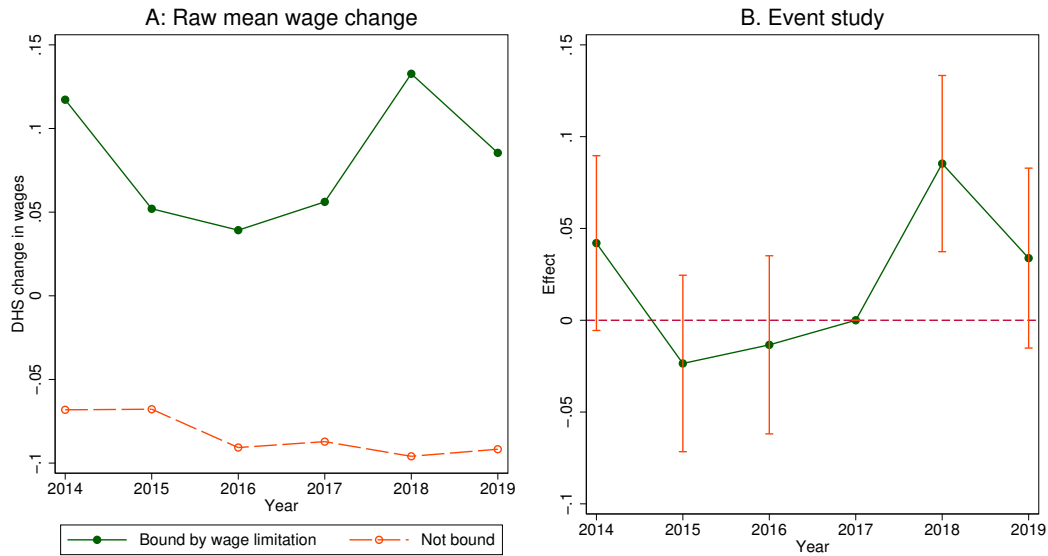
A: Raw mean wage change

B. Event study

Bound by wage limitation — Not bound

Notes: Using the S Corporation Sample, Panel A plots the change in wages paid by S corporations to their shareholders, as measured by the Davis-Haltiwanger-Schuh (DHS) difference, for a subset of S corporations. In particular, the sample is restricted to those firms that (as of t_2) 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 $t-2$ 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 $t-2$ 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 $\frac{w_{it}-w_{i,t-1}}{0.5(w_{it}+w_{i,t+1})}$), where w_{it} are wages paid to shareholders. Panel B plots the associated event study using the same dependent variable – i.e., the coefficients from Equation (1), but starting in 2014 rather than 2013, where treatment is defined as being bound by the wage limitation. Standard errors are clustered at the firm level. All panels were created by the authors using data from the population of tax returns.

Figure 7: Employee-to-contractor reclassifications

(a) Individuals
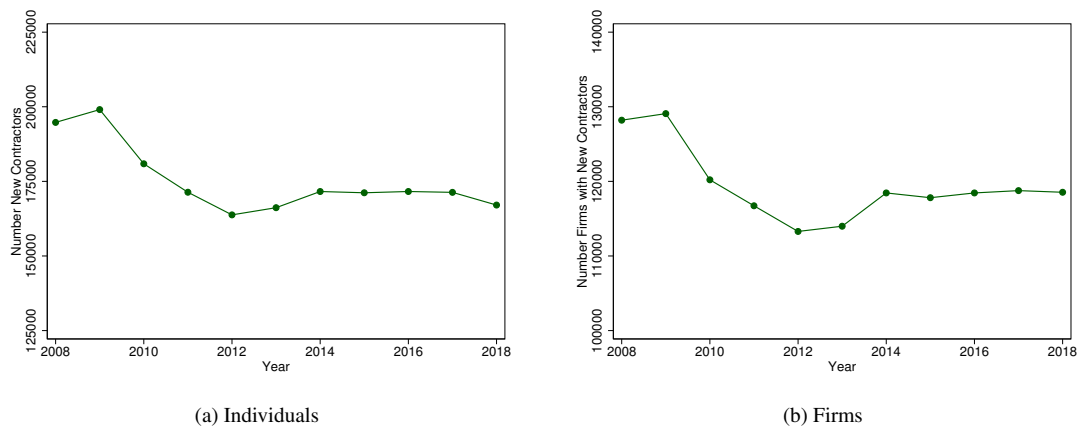
(b) Firms

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.
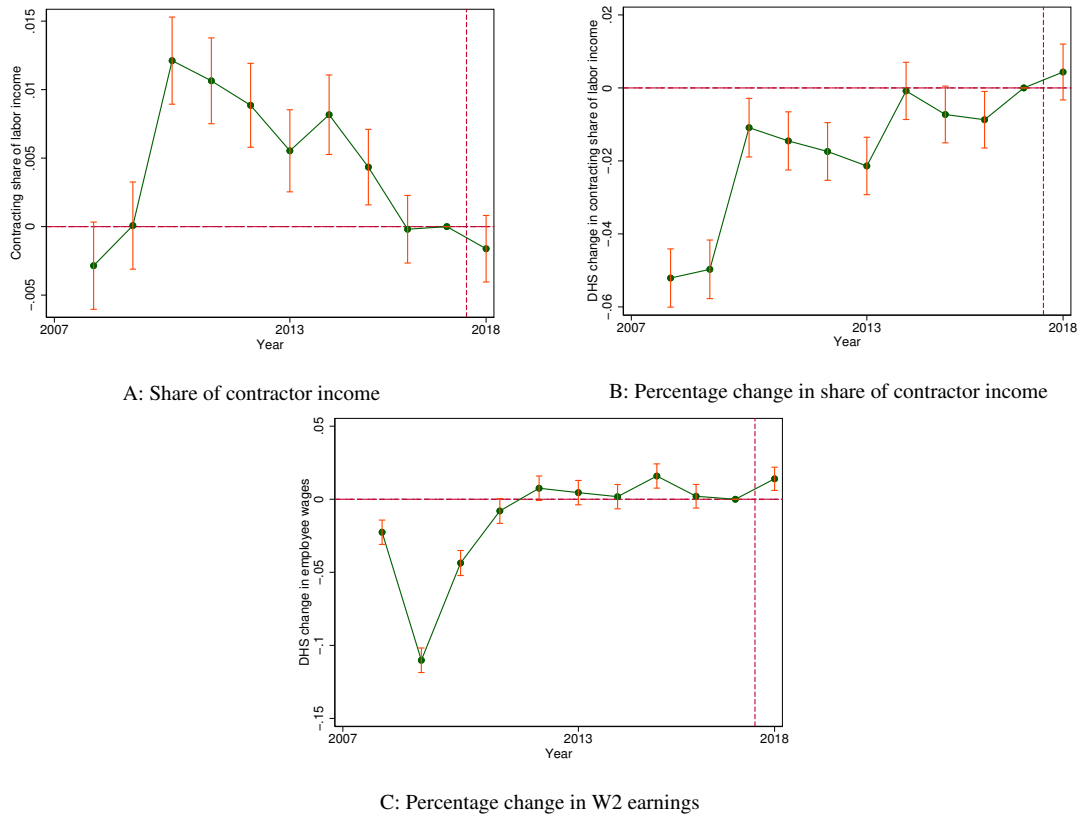
26

Figure 8: New contractor transitions
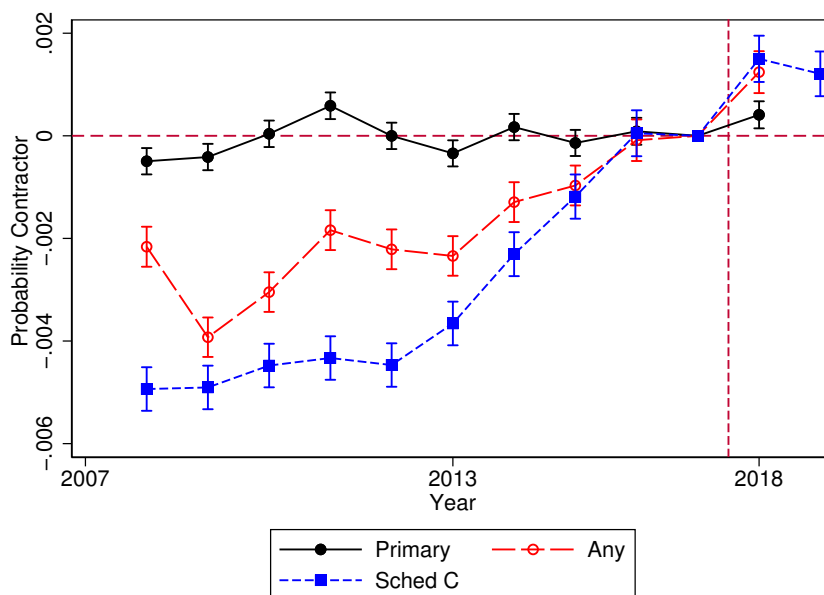
Notes: Transitions into receiving any Form 1099-MISC non-employee compensation, receiving majority of labor income from Form 1099-MISC non-employee compensation, and filing a Schedule C – all relative to 2017. The sample represents individuals 25-65 years of age who file a Form 1040.

Figure 9: Difference-in-differences: contractor transitions, below income threshold vs. above

A: New primary contractor

B: New any contracting

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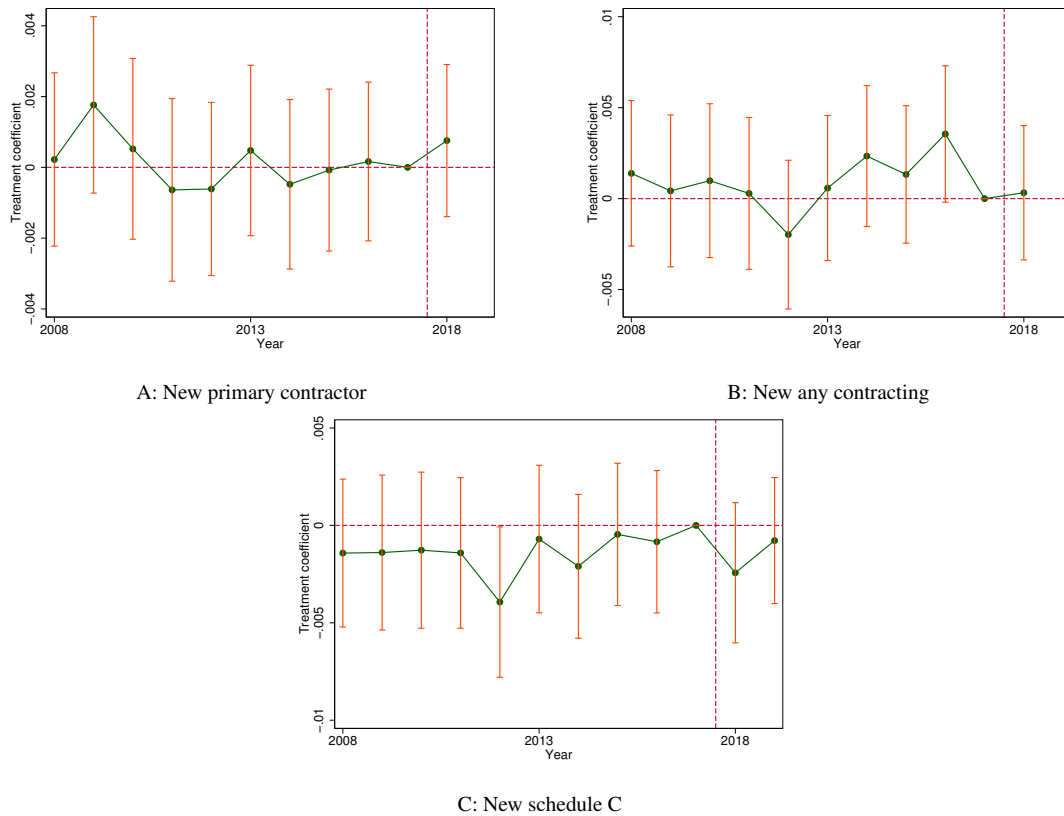
Notes: Difference in difference estimates comparing individuals with taxable income in the prior year placing them between 50% and 200% of the income threshold. Sample represents individuals 25-65 years of age who file a Form 1040 in both the current and prior tax year. Panel A shows estimates for transitions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

Figure 10: Changes in compensation among contractors

A: Share of contractor income

B: Percentage change in share of contractor income

C: Percentage change in W2 earnings

Notes: This figure shows time series evidence from 2008 to 2018 for three outcome variables, all normalized to zero in 2017. The sample comprises individuals aged 25 to 65 in our Individual Tax Filer Sample who file a Form 1040 in both year t and $t-1$, and who have Form 1099-MISC NEC income in year $t-1$. In Panel A, the outcome variable is the share of labor income that is contractor (Form 1099-MISC NEC) income. In Panel B, the outcome variable is the DHS percentage change in the share of labor income that is contractor (Form 1099-MISC NEC) income. In Panel C, the outcome variable is the DHS percentage change in Form W-2 earnings among those who had both Form W-2 and Form 1099-MISC NEC income in the prior year.

Figure 11: Effect of 199A exposure on S-corporation investment
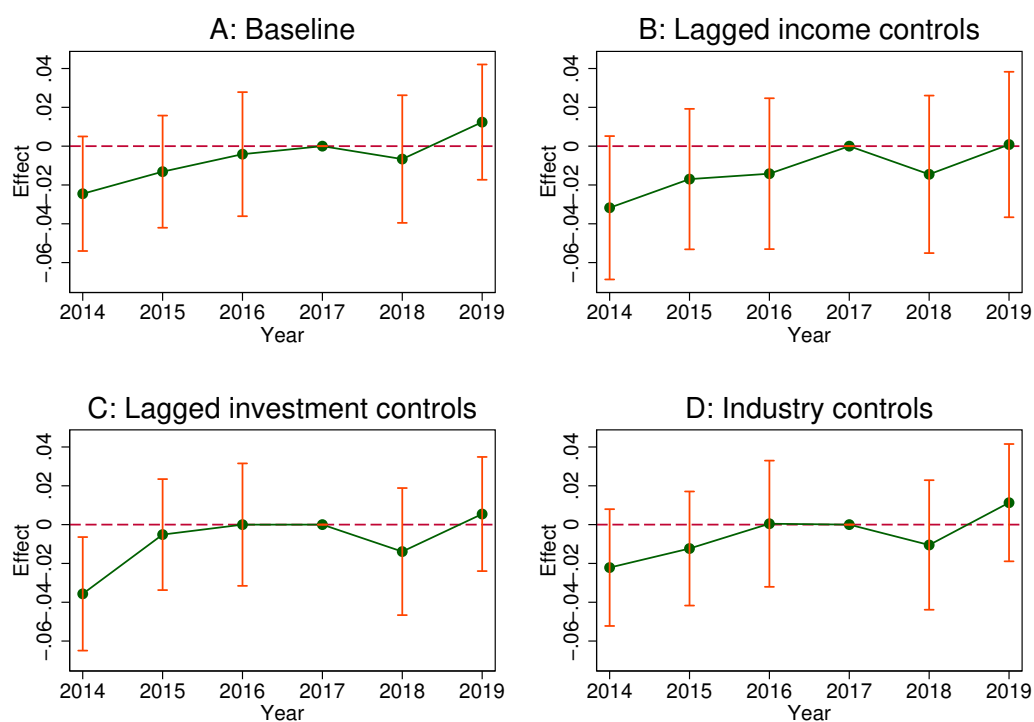
Notes: This figure plots an event study of the effect of section 199A on investment, I_{it}, in the S Corporation Sample. The dependent variable is the DHS difference of investment, $\frac{I_{it}-I_{i,t-1}}{0.5(I_{it}+I_{i,t+1})}$). Investment is defined as the basis of all property placed in service as reported on Form 4562. The sample is restricted to S corporations that are SSTBs throughout 2012-2017. Firms for whom fewer than half of shareholders (weighted by ownership) had income in excess of the 199A thresholds in $t-2$ are the treated group; other firms are control. Panel A includes only treatment and year fixed effects. Panel B includes a treatment fixed effect and fixed effects for fifty bins of $t-2$ business income interacted with year, which is defined as ordinary income plus wages to shareholders. Panel C includes a treatment fixed effect and fixed effects for fifty bins of $t-2$ investment interacted with year. Panel D includes a treatment fixed effect and fixed effects for 3-digit NAICS codes interacted with year. The sample is additionally restricted to those firms that file Form 1120S electronically in t, $t-1$, and $t-2$. Standard errors are clustered by firm.

Figure 12: Effect of 199A exposure on S-corporation employment and wages
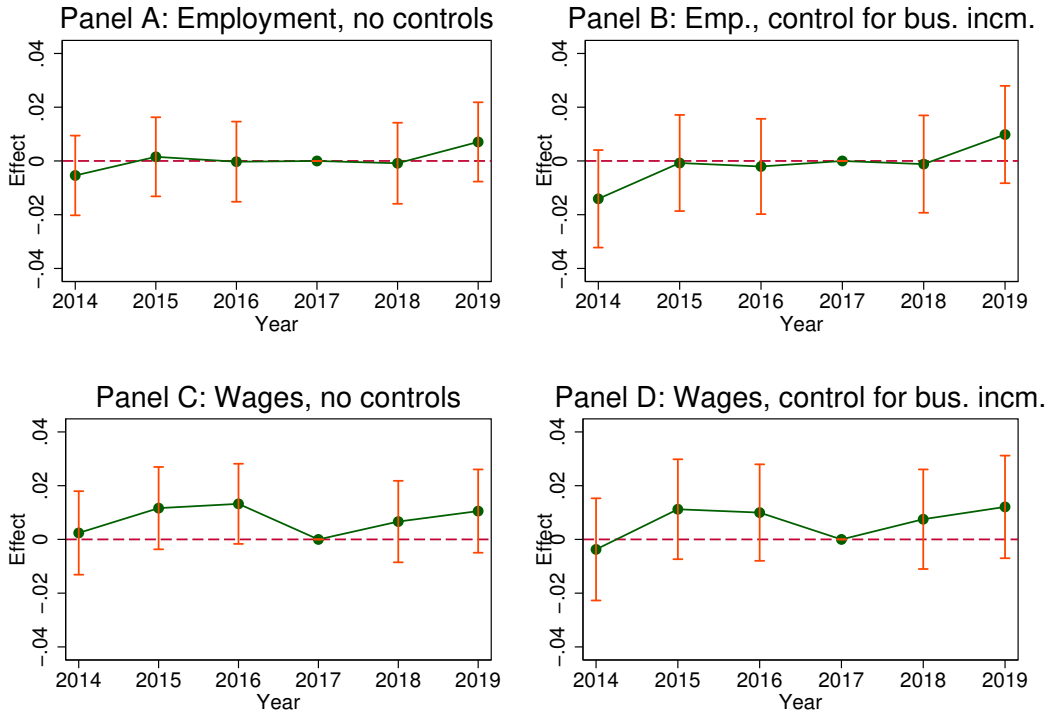
Notes: Panels A and B figure plots an event study of the effect of section 199A on number of non-shareholder employees in the S Corporation Sample. Panels C and D plot an event study of the effect of section 199A on the wages paid to non-shareholders. The dependent variable is the DHS difference of employment or wages (y_{it}), respectively, $\frac{y_{it}-y_{i,t-1}}{0.5(y_{it}+y_{y,t+1})}$). 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 that are SSTBs throughout 2012-2017. Firms for whom fewer than half of shareholders (weighted by ownership) had income in excess of the 199A thresholds in $t-2$ are the treated group; other firms are control. Panels A and C include only treatment and year fixed effects. Panels B and D include a treatment fixed effect and fixed effects for 50 bins of $t-2$ business income, which is defined as ordinary income plus wages to shareholders. Standard errors are clustered by firm.

Table 1: Summary statistics on individual samples

	Pass-through Owner Sample	Individual Tax Filer Sample	Reclassified Worker Sample
Fraction married filing jointly	0.43	0.58	0.53
Fraction non-joint male	0.27	0.20	0.27
Fraction non-joint female	0.29	0.22	0.21
Mean age	46.6	44.4	43.1
Years covered	2008-2019	2007-2019	2007-2018
Observations (thousands)	36,895	19,347	32,322

	Mean	Median	Standard Deviation	Fraction with nonzero value
Pass-through Owner Sample				
Adjusted gross income	84,290	40,600	962,457	0.90
Sole proprietorship income	4,191	0	2,448,621	0.31
S-corp and partnership income	7,457	0	561,460	0.11
Partner guaranteed payments	707	0	67,321	0.01
Rent and royalty income	579	0	45,250	0.13
Potential QBI	12,412	0	8,434,087	0.43
Individual Tax Filer Sample				
Adjusted gross income	86,476	52,600	594,894	0.99
Labor income	42,694	28,700	206,715	0.82
Wages	40,570	27,200	184,123	0.79
Contractor income	2,125	0	92,472	0.09
Reclassified Worker Sample				
Labor income	43,449	21,200	1,519,087	1.00
Wages	33,588	12,200	283,376	0.78
Contractor income	9,861	1,000	1,492,086	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, 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: New 2018 contractor 199A claiming

			Probability Claiming 199A					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
New 2018 Primary Contractor	-0.126	-0.022	-0.106	-0.019	-0.066	-0.013	-0.041	-0.011
	(0.004)	(0.003)	(0.004)	(0.003)	(0.006)	(0.004)	(0.006)	(0.004)
New 2018 Any Contractor Income	-0.125	-0.028	-0.117	-0.026	-0.072	-0.014	-0.059	-0.011
	(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 2018 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.

33

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 $t - 2$ 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.[37] 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 and 2019 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.[38] 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 394,000 tax units (aggregated between 2018 and 2019) with this NAICS code with income below the 199A thresholds are claiming QBI deductions of $29 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 169,000 tax units claim a deduction of $73 billion, which is 31 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

---

[37]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.

[38]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.

characterization is an imperfect but meaningful signal of ineligibility due to the 199A SSTB limitation.

Throughout the paper we use $t - 2$ information to determine SSTB status because we see some evidence that after 199A firms were more likely to change their NAICS code to be one that did not correspond (loosely) to an SSTB category. Appendix figure A1 shows that among S corporations with at least one owner above the income threshold in $t - 2$ there was a large jump in the fraction of firms changing their NAICS code from an SSTB to a non-SSTB in 2018 and 2019 relative to two years prior. There was no such jump among firms with non-SSTB NAICS codes. Additionally there was a much smaller jump in reclassifications among firms with no owners above the income threshold. Appendix Figure A2 shows that one of the most common NAICS codes to move out of was consulting and that this behavior was concentrated again among S corporations where at least one owner was above the income threshold and therefore limited by the SSTB limitation. These patterns suggest that firms responded to 199A by changing their reported NAICS code although the overall size of the effect was relatively small affecting less than 1 percent of firms.

Figure A1: NAICS-code switching for S corporations: moving from SSTB to non-SSTB status
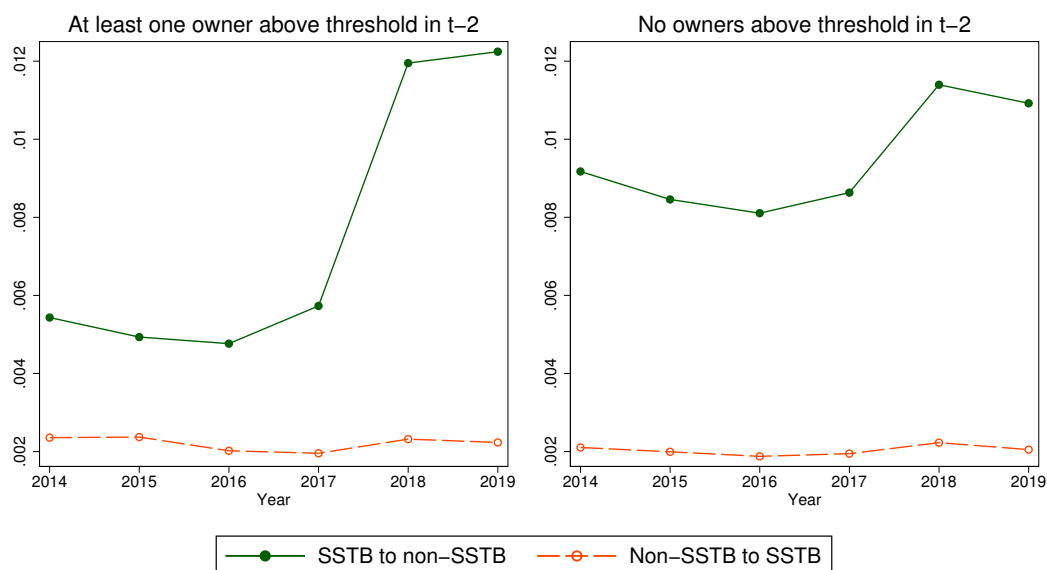
Notes: This figure uses the S Corporation sample. The [solid] series plots the probability of reporting a NAICS code in our set of SSTB NAICS codes (an "SSTB NAICS") in year t, conditional on reporting a non-SSTB NAICS in year $t-2$. The [dashed] series plots the probability reporting a non-SSTB NAICS in t conditional on reporting an SSTB NAICS in $t-2$. The left panel restricts to S corporations with at least one owner with income about the section 199A thresholds at $t-2$; the right panel restricts to the complement set of S corporations. 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.

Figure A2: NAICS-code switching for S corporations: moving from Consulting to non-SSTB status
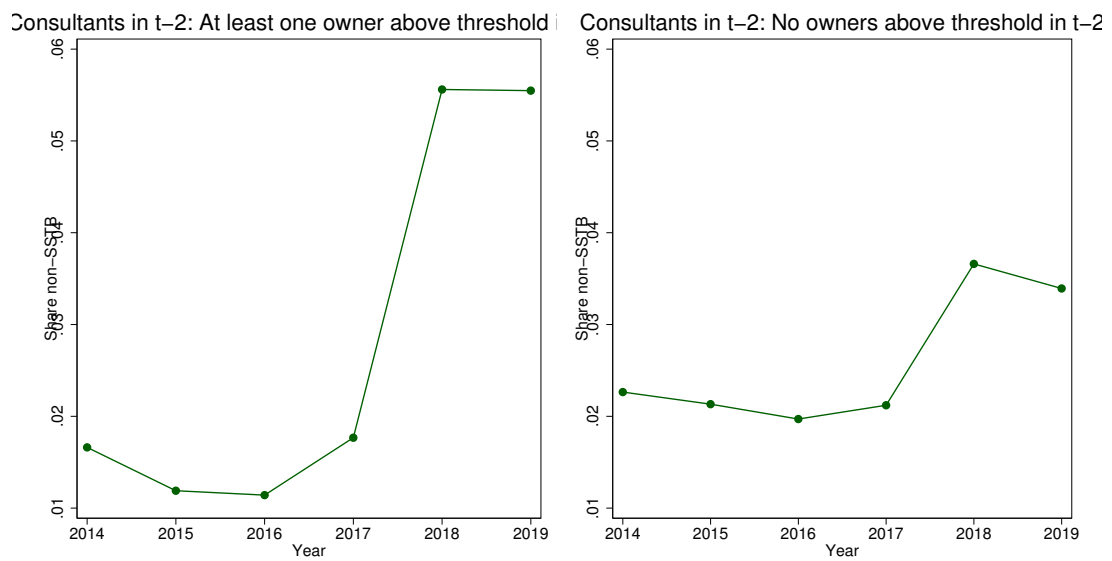
Notes: This figure uses the S Corporation sample, restricted to the set of S corporations that reported a four-digit NAICS code of 5416 (Management, Scientific, and Technical Consulting Services) at $t-2$. The series plots the probability of reporting a NAICS code at t that is not within our set of SSTB NAICS codes. The left panel restricts to S corporations with at least one owner with income about the section 199A thresholds at $t-2$; the right panel restricts to the complement set of S corporations. 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	Billions	Number (000s)	Percent Claimed	Billions	Number (000s)
SSTBs							
Securities, Other Financial Investments	523	48	29	394	31	73	169
Hospitals	622	60	0	8	20	1	4
Nursing and Residential Care Facilities	623	48	9	64	54	3	4
Performing Arts and Related Industries	711	53	17	766	33	16	34
Motion Picture and Video Industries	5121	62	3	81	50	2	4
Legal Services	5411	60	49	451	19	112	146
Accounting, Tax Preparation, Bookkeeping, Payroll	5412	57	23	443	22	19	43
Management, Scientific, and Technical Consulting Services	5416	57	27	472	33	26	97
Offices of Physicians	6211	60	24	222	21	57	182
Offices of Dentists	6212	66	16	127	25	17	50
Offices of Other Health Practitioners	6213	62	26	503	30	10	42
Outpatient Care Centers	6214	53	1	23	28	5	20
Home Health Care Services	6216	32	5	211	51	2	5
Other Ambulatory Health Care Services	6219	47	1	17	29	1	5
Lessors of Nonfinancial Intangible Assets	53311	32	0	11	44	1	1
Veterinary Services	54194	68	4	42	30	2	7
Borderline SSTBs							
Architectural, Engineering Services	5413	64	19	303	72	14	29
Specialized Design Services	5414	59	6	179	53	2	9
Computer Systems Design Services	5415	63	18	315	65	15	30
Non-SSTBs							
Manufacturing	31	58	30	402	81	66	77
Wholesale Trade	42	60	27	388	78	56	72
Construction of Buildings	236	47	35	722	76	22	25
Newspaper, Book Publishers	5111	60	1	15	73	1	2
Restaurants and Eating Places	7225	62	16	270	82	11	25

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 our baseline specifications.

B.1 Alternative measures of pass-through income

In our baseline results, we use the share of AGI that comes from QBI as our outcome measure. Here we explore two alternative outcomes. The first is potential QBI in levels, with non-zero values Winsorized at the 1 percent and 99 percent levels. The second 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).[39] These alternative measures will be able to capture increases in QBI among individuals who receive all of their income from QBI, which under our baseline specification would show no change. 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.

Figure B1 shows the results of our two difference-in-differences strategies using QBI in levels as the outcome. When we compare SSTB owners below the income threshold to those above it, we see that this specification suffers from pre-existing trends. QBI grows faster in the treatment group (those below the income threshold) relative to the control group (those above the income threshold). In particular, between 2013 and 2017, the treatment group's average QBI increased around $10,000 more than the control group's average QBI, relative to a baseline mean of $155,000. This trend roughly continues through 2019, which presents a descriptive pattern consistent with a null effect. In Panel B, we show the estimated effect of 199A on QBI levels comparing non-SSTB owners to SSTB owners among those with income above the limitation thresholds. There is again a slight pre-trend where non-SSTB owners (the treatment group) seem to have faster growth in QBI than SSTB owners (the control group), with perhaps some intertemporal income shifting out of 2017 for SSTB owners. Relative to 2017, we can rule out increases of around $6,000 on a base of $245,000.

In Figure B2 Panel A, we present results for the inverse hyperbolic sine transformation of potential QBI. The difference-in-differences specification using SSTB owners above and below the income threshold shows that 2018 and 2019 changes are not statistically different from zero and represent a continuation of a slight upward trend. We can rule out an increase in potential QBI of more than about eight percent.[40] In Panel B, the comparison between non-SSTB and SSTB owners is relatively noisy, but the 2018 and 2019 estimates are relatively small in magnitude.

B.2 Alternative QBI Measure

Next, we redo our original analyses using an alternative definition of potential QBI that includes 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 to qualify for the deduction. Our baseline QBI measures exclude

---

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

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

rent and royalty income, which around 13 percent of our sample have. If the subset of this income that is eligible for 199A is particularly responsive to the deduction, our baseline results may be biased towards finding null results. However, Figure B3 shows that our difference-in-difference results under the alternative income definition are almost identical to our baseline results.

B.3 Wages to S corporation shareholders

In this section, we explore alternative specifications for studying the effect of section 199A on the wages paid to S corporation shareholders.

First, we check whether adding additional controls improves the fit of the event study in the change in wages described in panel B of Figure 3. We add controls for industry by year fixed effects, lagged business income (defined as ordinary income plus wages to shareholders) by year fixed effects, and the full interaction of industry, lagged business income bin, and year in Figure B4. Under any of these specifications, we can rule out a meaningfully different response in 2018 between single- and multi-shareholder firms. The 2019 estimates also are small and not statistically significant with the exception of those with industry and income fixed effects, which are marginally statistically significant but remain small in magnitude.

Next, we explore whether our multi- single-shareholder results are unduly affected by two or three shareholder firms, which may be able to coordinate to take advantage of 199A tax savings in a similar way to single-shareholder firms. 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 exercise.

Appendix Figure B5 repeats the analysis shown in Figure 3 except this figure drops two- and three-shareholder firms, meaning that the comparison is made between single-shareholder firms and firms with at least four shareholders.[41] While the series is a bit noisier, these figures show no evidence any large reduction in wages to owners of single-shareholder firms.

Third, we use SSTB status of the S corporation for identification using a similar method to our difference in difference specifications that compared SSTB to non-SSTB owners above the income threshold. For S corporation owners, among owners above the income threshold, SSTB owners did not face the additional incentive to reduce wages, while non-SSTB owners did. In Appendix Figure B6, we trace the change in wages for the treated (non-SSTB) and control (SSTB) S corporations, restricting the sample to single-owner shareholders who were above the income threshold in $t - 2$. Given the sample restrictions, the estimates are slightly noisier than the main specifications, but remain consistent with a null effect of 199A on overall wages paid to S corporation shareholders in 2018 and 2019.

---

[41]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: effect of section 199A deduction on potential QBI in levels
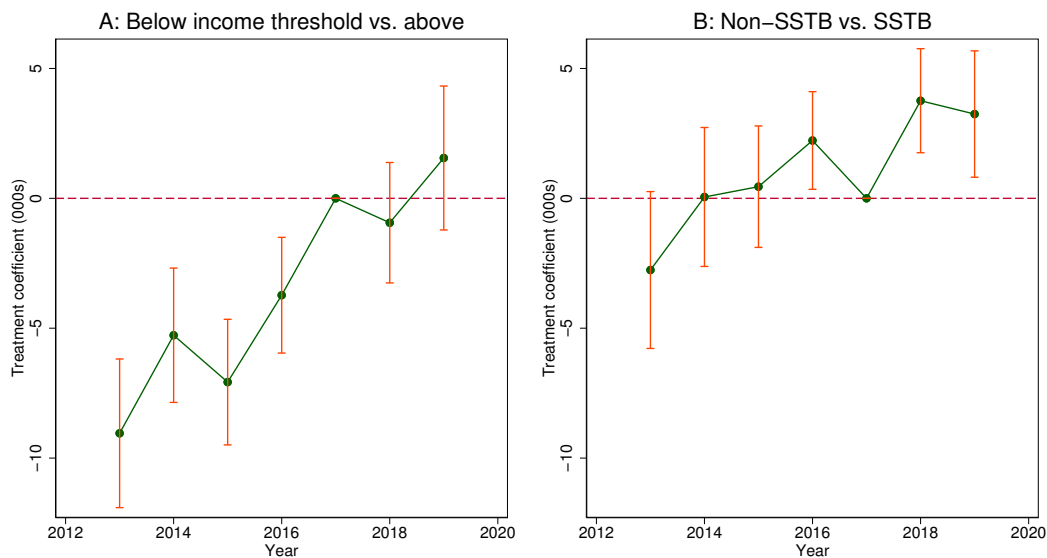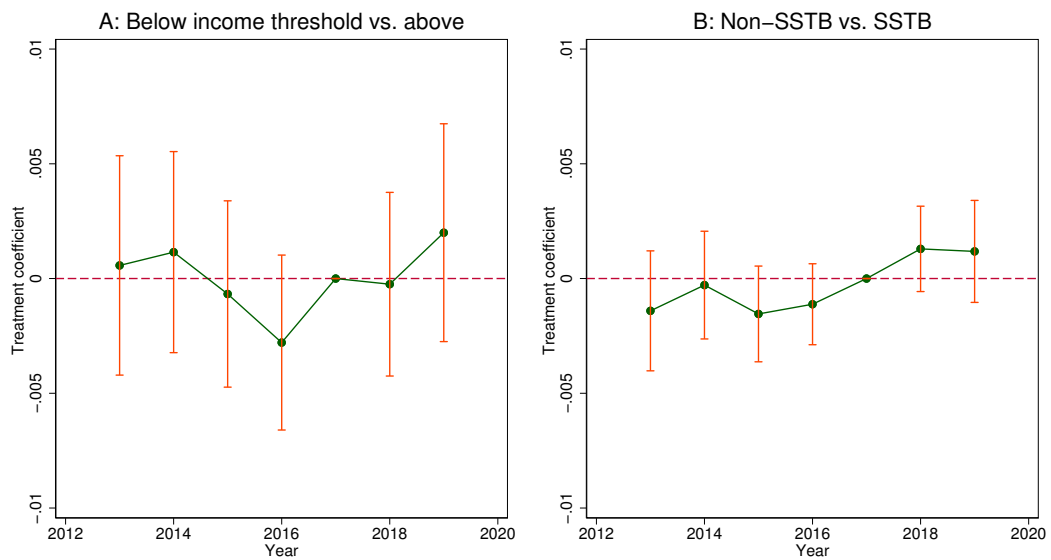

Notes: This figure presents results analogous to those in Figure 2, except that the dependent variable is the amount of potential QBI, in levels. The dependent variable is Winsorized at the 1st and 99th percentiles. See Sections III.A and B.1 for further regression details. All panels were created by the authors using data from the population of tax returns.

Figure B2: Difference-in-differences: effect of section 199A deduction on potential QBI, transformed using the inverse hyperbolic sine
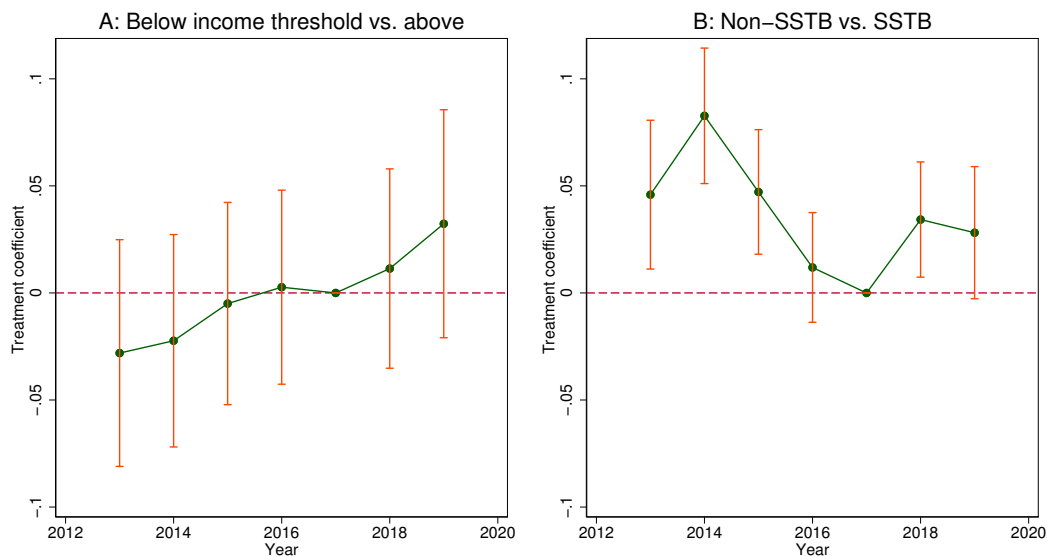
Notes: This figure presents results analogous to those in Figure 2, except that the dependent variable is the inverse hyperbolic sine of potential QBI (with potential QBI scaled in thousands of dollars). See Sections III.A and B.1 for further regression details. All panels were created by the authors using data from the population of tax returns.

Figure B3: Difference-in-differences: effect of section 199A deduction on potential QBI scaled by AGI, adding rents and royalties

Notes: This figure presents results analogous to those in Figure 2, except that potential QBI is defined to include Schedule E rental and royalty income in addition to the income included in the baseline measure in Figure 2. See Sections III.A and B.1 for further regression details. All panels were created by the authors using data from the population of tax returns.

Figure B4: Wages to S corporation shareholders: additional fixed effects

Notes: This figure reports the coefficients to event studies analogous to Panel B in Figure 3 with additional fixed effects added to the regression. In Panel A, we interact year fixed effects with three-digit industry fixed effects. In Panel B, we interact year fixed effects with twenty bins of business income (measured at $t-2$), where business income is defined as the ordinary income of the S corporation plus the wages paid to shareholders. In Panel C, we combine the fixed effects in Panel A and B: that is, we interact year fixed effects with interacted fixed effects for business income and three-digit industry. All panels were created by the authors using data from the population of tax returns.

Figure B5: Wages to S corporation shareholders: dropping 2-3 shareholder firms

Notes: This figure is analogous to Figure 3, except that S corporations with two or three shareholders are dropped. All panels were created by the authors using data from the population of tax returns.
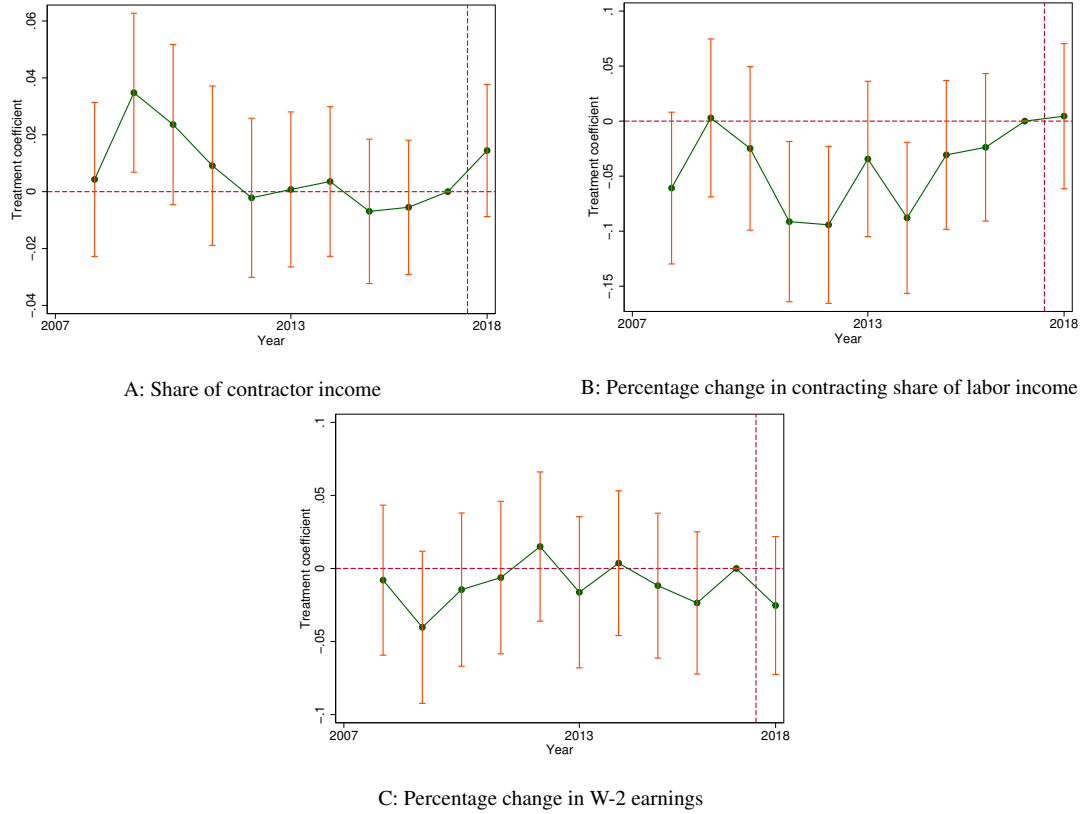
Figure B6: Wages to shareholders of S corporations, exploiting SSTB status for identification
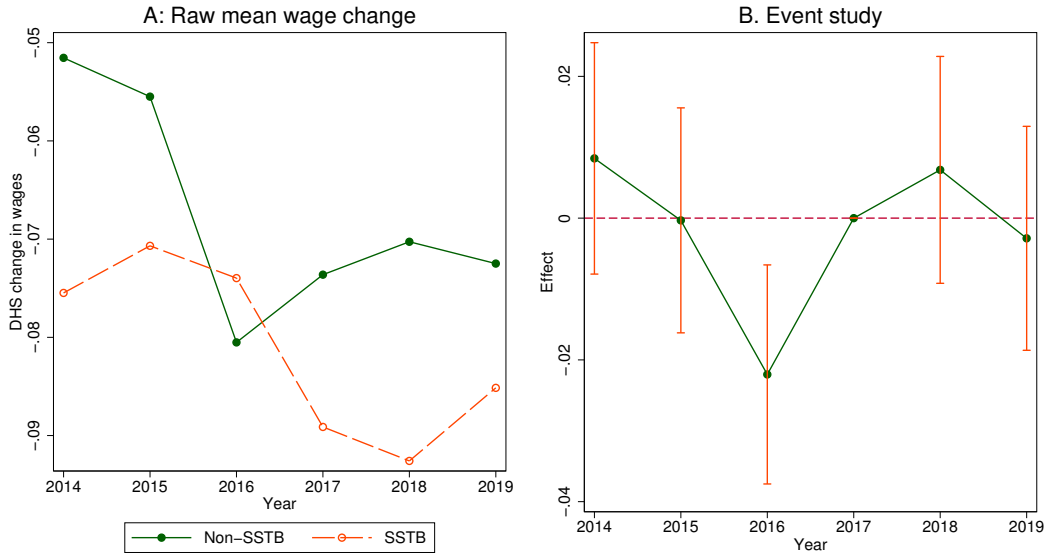
Notes: Using the S Corporation Sample, Panel A plots the change in wages paid by S corporations to their shareholders, as measured by the Davis-Haltiwanger-Schuh (DHS) difference, separately for SSTBs and non-SSTBs. The DHS difference is defined as $\frac{w_{it} - w_{i,t-1}}{0.5(w_{it} + w_{i,t+1})}$, where w_{it} is wages to shareholders. The sample is restricted to those firms that (as of t_2) are non-SSTBs, have one shareholder, and that one shareholder has income above the 199A thresholds. Panel B plots the associated event study using the same dependent variable – i.e., the coefficients from Equation (1), but starting in 2014 rather than 2013, where treatment is defined as being a non-SSTB. Standard errors are clustered at the firm level. All panels were created by the authors using data from the population of tax returns.

44

C   Additional Figures and Tables

Figure C1: Difference-in-differences: compensation among contractors, below income threshold vs. above

A: Share of contractor income

B: Percentage change in contracting share of labor income

C: Percentage change in W-2 earnings

Notes: This figure shows difference-in-differences estimates for three outcome variables, comparing individuals with taxable income in the prior year placing them below or above the 199A thresholds. The sample comprises individuals aged 25 to 65 in our Individual Tax Filer Sample who file a Form 1040 in both year t and $t-1$, who have Form 1099-MISC NEC income in year $t-1$, and who were between 50% and 200% of the 199A income thresholds in $t-1$. In Panel A, the outcome variable is the share of labor income that is contractor (Form 1099-MISC NEC) income. In Panel B, the outcome variable is the DHS percentage change in the share of labor income that is contractor (Form 1099-MISC NEC) income. In Panel C, the outcome variable is the DHS percentage change in Form W-2 earnings among those who had both Form W-2 and Form 1099-MISC NEC income in the prior year.

Table C1: S corporation sample: summary table

	(1) Mean	(2) Median
Net income	113,993	11,003
Tangible investment	42,839	0
Wages paid to shareholders	54,511	3,473
Any wages to shareholders	0.516	
Number of shareholders	1.599	1
Share single shareholder	0.650	
Share of shareholders above 199A thresholds	0.172	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.