Office of Tax Analysis
Working Paper 118
May 2019

Simulating the 199A Deduction for Pass-through Owners

Lucas Goodman*, Katherine Lim*, Bruce Sacerdote* and Andrew Whitten*

U.S. Department of the Treasury
Office of Tax Analysis
May 2019

SIMULATING THE 199A DEDUCTION FOR PASS-THROUGH OWNERS

May 2019

Lucas Goodman[1], Katherine Lim[2], Bruce Sacerdote[3] and Andrew Whitten[4]

We analyze the new Section 199A deduction for pass-through income using a representative sample of administrative data from tax year 2016. We identify the taxpayers who would have benefited from the pass-through deduction had it applied in 2016. The analysis uses taxpayers' reported income, abstracting from behavioral responses, and applies key aspects of 2018 tax code. We do not attempt to model any potential economic growth spurred by 199A, nor do we model the economic incidence of the deduction. The estimated tax savings from the deduction, measured in 2018 dollars, is $34.5 billion. The majority of the beneficiaries of the deduction are in the bottom 80 percent of the income distribution. However, 60 percent of pass-through income, and 72 percent of the statutory benefit of the pass-through deduction, accrues to taxpayers in the top five percent of adjusted gross income (above roughly $208,000). Without the 199A guardrails, we estimate that this group would receive 83 percent of the statutory benefit.
(JEL H24, H25, H26)

Keywords: Section 199A, Pass-through Deduction, Administrative Tax Data

1 Lucas Goodman: Office of Tax Analysis, U.S. Department of the Treasury, Lucas.Goodman@treasury.gov.
2 Katherine Lim: Office of Tax Analysis, U.S. Department of the Treasury, Katherine.Lim@treasury.gov.
3 Bruce Sacerdote: Department of Economics, Dartmouth College, Bruce.i.sacerdote@dartmouth.edu.
4 Andrew Whitten: Office of Tax Analysis, U.S. Department of the Treasury, Andrew.Whitten@treasury.gov.

U.S. Department of the Treasury
Office of Tax Analysis
May 2019

Around half of business income in the United States is earned by pass-through businesses such as partnerships, sole proprietorships, and S corporations (Cooper et al., 2016). Recently-passed tax legislation, colloquially known as the Tax Cuts and Jobs Act (TCJA; P.L. 115-97), created a new deduction on this income for many individual pass-through business owners, effective in 2018. In this paper, we provide a detailed analysis of which taxpayers will likely benefit from the new deduction. Using a sample of 780,000 taxpayers that is representative of the population who reported pass-through income in 2016, we examine the distribution and size of the deduction had it been in effect for tax year 2016. We take reported incomes as given but apply the 2018 tax code. Thus the results represent the effect of the deduction under the assumption that owners and businesses do not have any behavioral responses to this provision or any other provisions of TCJA. While this assumption is unrealistic, it nonetheless provides a useful benchmark.[1]

The distribution of tax savings under the pass-through deduction is unclear a priori. Pass-through income is known to be highly concentrated at the top of the income distribution. For example, Cooper et al. (2016) show that 67 percent of S corporation income, and 69 percent of partnership income, accrues to the top one percent of tax units.[2] This is significantly more concentrated than C corporation income (as proxied by dividends), of which 45 percent accrues to the top one percent (Cooper et al., 2016). However, the rules and regulations of Section 199A establish guardrails that limit who may benefit from the deduction. Two limitations begin phasing in at $315,000 in taxable income for married taxpayers ($157,500 for unmarried) that affect the distribution of tax savings under Section 199A.[3] For taxpayers with incomes above the top of the phase-in range, the guardrails eliminate the portion of the 199A deduction derived from businesses that either are "specified service trades or businesses" (SSTBs) or do not pay sufficient W-2 wages or own enough capital assets.

Our baseline estimate is that taxpayers would have claimed $156 billion in deductions in the absence of behavioral responses, which translates into total tax savings of $34.5 billion.[4] This estimate is adjusted for inflation to 2018 dollars, as are all dollar values generally throughout the paper. We caution that this baseline estimate overstates the steady-state no-behavior tax savings, because it does not take into account carryforward of prior year losses. The section 199A deduction requires that individuals with pass-through losses carry them forward to offset future gains before claiming the deduction on those gains. These carryforwards are irrelevant in the first year of the 199A deduction, but over time they will reduce the tax savings from the deduction. To gauge the magnitude of this effect, we estimate that taxpayers would have created $273 billion in losses to be carried-forward in 2016. Assuming that half of these carryforwards would ultimately offset future pass-through income for taxpayers with average marginal tax rates of 32%, the future reduction in tax savings is $8.7 billion. Thus a crude estimate of steady-state no-behavior tax savings is $34.5b - $8.7b = $25.8 billion.

We estimate that the section 199A guardrails for higher income taxpayers significantly curtail the tax savings associated with the deduction. Without these guardrails, our baseline estimate (ignoring

---

[1]By assuming behavior is fixed, we also implicitly assume that the full incidence of the tax savings is on the business owner to which the savings are statutorily assigned. In reality, as markets adjust to the incentives to invest in pass-through businesses, other members of the economy – such as employees of pass-through businesses or owners of capital more generally – may benefit from the pass-through deduction as well. We do not estimate these effects.

[2]Note, though, that tax units are not a close proxy for households. Larrimore, Mortenson and Splinter (2017) find that household incomes are more equally distributed than are tax unit incomes.

[3]For this purpose, taxable income is determined disregarding the potential Section 199A deduction. The length of the phase-in region is $100,000 for married taxpayers and $50,000 for unmarried taxpayers.

[4]This estimate includes only the pass-through deduction for individuals. It excludes the Section 199A deduction for qualified Real Estate Investment Trust dividends, qualified publicly traded partnership income, and certain income from co-operatives.

carryforward losses) increases by 66 percent, to $57.4 billion.[5] This effect is driven by two separate limitations that only apply to high-income taxpayers. First, they may not claim the deduction on income from service sector businesses. Relative to the no-guardrails scenario, this reduces the estimated tax savings by $13.4 billion. Second, they may not claim the deduction on income from (non-service) businesses that do not have sufficiently large wage bills or capital stock. This further reduces the tax savings by $9.5 billion.

The guardrails also have significant distributional implications. In the absence of guardrails, we estimate that 83 percent of the total tax savings from the pass-through deduction accrues to the top five percent of tax units, with 64 percent accruing to the top one percent. After accounting for the guardrails, the top five percent and top one percent receive 72 and 47 percent of the tax savings, respectively. For comparison, these groups report 60 and 43 percent of (positive) pass-through business income. Thus, in aggregate, the guardrails bring the distribution of tax savings more in line with the distribution of pass-through income.

By their nature, the guardrails affect owners of certain types of businesses more than others. Looking across industries, we find that owners of professional services, health, and finance/insurance businesses – three of the top five industries generating pass-through business income – are particularly affected by the guardrails. Owners in these three industries see their tax savings from these businesses reduced by 59 percent, or $12.9 billion. In aggregate, these three industries account for over half of the total effect of the guardrails. This effect is driven by a combination of firms in such industries being more likely (1) to be owned by taxpayers above the income thresholds, (2) to be an SSTB, or (3) to have insufficient W-2 wages or capital assets. In contrast, owners of businesses in the other two of the top five industries – construction and real estate – have their tax savings reduced by only 30 percent, or $3.7 billion. This accords with intuition, as these industries are capital intensive and are less likely to contain SSTBs.

The actual tax savings realized in 2018 will differ from our 2016-based estimates for a number of reasons. First, our estimates are based on a simple application of the 199A deduction and the 2018 tax schedule to 2016 concepts of taxable income adjusted for the largest components of the TCJA. In reality, in 2018 the other unmodeled provisions of the TCJA will also change the definition of taxable income.[6] Second, our calculated tax savings require assumptions to determine the effect of the guardrails. While the tax data provide rich information to approximate which taxpayers and incomes are eligible, actual eligibility will depend on facts and circumstances of the business and taxpayer that are not readily observable from 2016 tax returns. Finally, taxpayers will almost certainly respond to the provisions, changing behavior in order to receive larger deductions. At present, it remains unknown to what extent and on which margins taxpayers will respond. We hope to shed light on these questions once data from the 2018 tax year are available.

I Institutional Background

In the U.S., pass-through businesses 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. Pass-through business income generally retains its character, meaning that

---

[5]If we also relax the limitation whereby the deduction may not exceed twenty percent of ordinary taxable income, total tax savings rises to $62.9 billion. This limitation applies to all taxpayers regardless of income.

[6]The aggregate amount of income may also change in response to TCJA; we do not model this.

items like long-term capital gains from a pass-through business will be taxed at the individual's capital gains rate while ordinary business income will face the 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).

There are two crucial differences between the tax regimes of C corporations and pass-through businesses for individual owners. The first is that income earned in a pass-through only faces individual taxes while C corporation income faces the corporate tax, applied at the entity level, as well as individual-level taxes on shareholder dividends. The second is that owners of C corporations pay individual taxes only when dividends are distributed, while pass-through income is taxed in the year that it is earned regardless of when the income is distributed to owners. C corporations can generally retain earnings indefinitely, delaying the individual-level tax on dividends as long as desired. Determining whether effective tax rates are lower for C corporation or pass-through owners depends on a number of factors including the corporate tax rate, individual ordinary income tax rates, the dividend tax rate, the business's net profits, and the extent to which the business retains earnings. Despite this complexity, the overall trend is clear: since the Tax Reform Act of 1986, the share of business activity occurring in pass-through entities has been steadily increasing (Smith et al., 2017).

The taxation of pass-through owners' compensation for their labor varies depending on the entity type. Owners of sole proprietorships do not pay wages to themselves; 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 is not subject to payroll or self-employment taxes. Individual partners (owners of partnerships) face something of a hybrid of the tax treatments of sole proprietors and S corporation shareholders. They do not receive wage income, nor are they subject to reasonable compensation rules; however, the ordinary income they receive is generally subject to self-employment taxes, like sole proprietors' income. An important exception to this rule is that limited partners (roughly speaking, those who do not materially participate in the business) are not generally subject to self-employment taxes on their ordinary business income. Thus their income is taxed like that of an S corporation shareholder who is not employed by the S corporation. Though they avoid payroll taxes, passive owners of S corporations and partnerships are generally subject to the 3.8 percent Net Investment Income Tax, which is applied to the investment income of taxpayers above a certain income threshold ($250,000 if married filing jointly).

In December 2017, the bill originally titled the "Tax Cuts and Jobs Act" was signed into law. Among its many provisions is the introduction of Section 199A, which creates a deduction for pass-through owners, effective for tax years 2018 through 2025.[7] Though the rules governing this deduction are complicated, 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 income relative to other forms of ordinary income.

---

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

U.S. Department of the Treasury
Office of Tax Analysis
May 2019

Only income that is considered qualified business income (QBI) is eligible for the pass-through 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 to partners are also not considered QBI.

There are a number of limitations that constrain the 199A deduction. As we show, these limitations have a large effect on the distribution of the deduction benefits. Individuals with taxable income above the top of a phase-in range ($415,000 if married filing jointly, $207,500 for other taxpayers) are subject to two guardrails.[8] 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.[9] The second is that, for taxpayers above the top of the phase-in range, any portion of the deduction derived from a non-SSTB is reduced (potentially to zero) unless the business pays a sufficient amount of wages to employees or owns a sufficient amount of tangible capital. Specifically, the amount of the deduction derived from a non-SSTB cannot exceed the greater of: half of the owner's share of W-2 wages, or the sum of 25 percent of the owner's share of W-2 wages plus 2.5 percent of the owner's unadjusted basis of qualified property.[10]

For all taxpayers, the 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. In addition, owners of multiple businesses must offset positive QBI with any negative QBI, potentially reducing the deduction. If the net quantity of QBI is negative, it must be carried forward to future years in order to offset positive QBI.[11]

II   Data and Historical Trends

Our data are drawn from the population of federal tax returns and information returns of individuals and businesses in the United States. In particular, we take a two percent sample of all individuals who report nonzero pass-through income (i.e., income or loss on Schedules C, E, or F of the Form 1040) as a primary filer in 2016.[12] We keep only observations where the sampled individual is between ages 18 and 90 and is neither deceased nor in the year of their death. Year of birth and year of death, in addition to sex at the time of birth, are observed from Social Security Administration records and are matched to the tax data via Social Security Numbers.

By construction, our sample is representative of the universe of taxpayers who report pass-through income in 2016. We focus on this group because they comprise taxpayers who are particularly likely to be affected by the new 199A deduction, including both taxpayers who consistently report pass-through income as well as those who only occasionally report such income. The incentives created by Section

---

[8]These limitations are phased in from $315,000-$415,000 in income for joint filers and $157,500-$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.

[9]To be clear, for taxpayers below the phase-in thresholds, SSTBs can generate QBI.

[10]"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.

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

[12]Pass-through income cannot be easily split between joint filers so it is assigned at the tax unit level. By sampling at the primary tax filer level, we avoid giving joint filers a higher likelihood of entering our sample for the same pass-through income.

199A are also relevant for taxpayers who have never reported pass-through income, to the extent that they consider beginning to report such income under the new tax regime. However, these responses are irrelevant for purposes of calculating the no-behavior benchmark, which is the focus of this paper.

We construct detailed information on pass-through business income. From Schedule E we observe total net gains or losses from partnerships or S corporations, passive gains and passive losses from partnerships or S corporations, rental income, royalty payments, and income from estates and trusts. For tax units with sole proprietorship income reported on Schedule C, we compute the total amounts of the following variables across all sole proprietorships: gross receipts, income before expenses, wages paid, and total expenses. We also retain records for the two sole proprietorships with the highest gross receipts. We perform the same exercise for tax units with Schedule K1s from partnerships or S corporations. We compute the total amounts of the following variables across all partnership K1s and all S corporation K1s (as well as retaining specific records for the two highest potential QBI businesses): potential QBI, ordinary income, and guaranteed payments. For taxpayers with partnership or S corporation income, our measure of potential QBI is derived from Schedule K1 data.[13] It is the sum of ordinary income, net rental real estate income, other net rental income, royalties, and interest payments, less any Section 179 deduction. For taxpayers with other business income reported on Schedules C, E, or F, we assume all such net income is potential QBI. Whether income is actually QBI depends on the taxpayers' income and whether the income is derived from an SSTB. For the two highest potential QBI businesses, we also retain ownership shares and match K1s with Forms 1065 (partnerships) and 1120-S (S corporations) in order to retrieve NAICS industry codes, wages paid, and a proxy for tangible capital.

In the top panel of Table 1, we show demographic information for our sample. 56 percent of the sample is married filing jointly; the remaining 44 percent are nearly evenly split between sex. The median and mean age of the sample is 50 years old. The median adjusted gross income (AGI) of our sample is $55,200, which is modestly larger than the national median AGI of tax filers, $42,700.[14] The median amount of pass-through income is quite small, at $3,500, indicating that pass-through businesses are not the dominant income source for many taxpayers with this type of income. Additionally, over a quarter of our sample have net pass-through losses. Unsurprisingly, mean AGI and mean pass-through income are substantially larger than their associated medians, at $117,242 and $28,755 respectively.

We identify five different sources of pass-through income that could potentially be eligible for the pass-through deduction: farming income from Schedule F, sole proprietorship income from Schedule C, partnership and S corporation income from Schedule E, and rents and royalties separately stated on Schedule E.[15] In the bottom panel of Table 1, we report statistics for the subsamples that have nonzero amounts of these types of income. The most common forms of pass-through income earned by the sample are Schedule C (sole proprietors), S corporations and partnerships, and rental income from Schedule E. Among taxpayers that have Schedule C income, the median amount is $4,000 and the mean

---

[13]One limitation of using the K1 data is that it does not account for passive income loss limitations, which are reflected on the taxpayer's Schedule E. Under Section 199A, such losses would be included in the QBI calculation only when they are ultimately recognized.

[14]Here, and throughout the paper, all dollar values are adjusted to 2018 levels using the July Consumer Price Index for All Urban Consumers. To protect taxpayer privacy, medians are rounded to the nearest $100. The figure for the national population is constructed using the representative, cleaned sample produced by the Statistics of Income division of the IRS.

[15]In general, rental income and royalty income are considered QBI only if the underlying activity rises to the level of a "trade or business" as defined in Section 162. In this paper, we assume that all rental income and royalty income meets this standard. Thus, our estimates for tax savings associated with these types of entities may be modestly overstated. In addition, we do not model the possible reduction in the section 199A deduction that may apply to farmers who participate in agricultural cooperatives.

5

Table 1: Summary Statistics

Fraction of Sample				
Married Filing Jointly	0.56			
Unmarried Male	0.21			
Unmarried Female	0.22			

	Mean	Median	Standard Deviation	
Age	50.3	50	15.9	
Adjusted Gross Income	117,242	55,200	1,127,570	
Total Pass-Through Income	28,755	3,500	468,567	
Sole Proprietorship	9,258	0	71,649	
S Corporation and Partnership	17,939	0	448,128	
Farms: Schedule F	-490	0	14,866	
Rents: Schedule E	8,373	0	66,048	
Royalties: Schedule E	776	0	145,352	
Observations	750,300			

Individuals with Non-Zero Income of Each Type

	Mean	Median	Standard Deviation	Fraction of Sample
Sole Proprietorship	14,194	4,000	88,321	0.652
S Corporation and Partnership	78,620	6,700	935,608	0.228
Farms: Schedule F	-10,558	-5,300	68,261	0.046
Rents: Schedule E	35,672	15,100	132,705	0.235
Royalties: Schedule E	15,056	300	640,205	0.052

Notes: The sample is constructed by selecting a 2% random sample of taxpayers with nonzero pass-through income in 2016. See Section II for details. Pass-through income is defined as the sum of net incomes on Schedules C, E, and F. Counts of observations are rounded to the nearest thousand and dollar values of medians are rounded to the nearest hundred. All dollar values are adjusted for inflation to 2018 levels. This table was created by the authors using data drawn from the population of tax and information returns.

is $14,194. For taxpayers with S corporation and partnership income, the median amount is slightly larger ($6,700), but the mean is substantially higher ($78,620). For taxpayers reporting rental income on Schedule E, the median amount is $15,100 and the mean is $35,672. Relatively few taxpayers report farming income or royalties. Of those that report farming income, the mean and median amounts are -$10,558 and -$5,300 respectively. Of those that report royalty income, the mean and median are $15,056 and $300, respectively.

To validate our data, we collect analogous samples for all years from 2005 to 2015. We then compare the aggregate amounts of income implied by these repeated cross-sections (and the 2016 cross-section) with those calculated from the cleaned cross-sectional data from the Statistics of Income (SOI) division of the Internal Revenue Service. These aggregates are plotted in Figure 1; panel (a) uses our sampling method, while panel (b) uses the SOI data. As the figure shows, partnership and S corporation income fell during the Great Recession but has grown rapidly in the post-recession years. In general, the edited and cleaned SOI data show a similar pattern as our data, confirming that our sample seems to measure pass-through income adequately.

Figure 1: Pass-Through Income Over Time
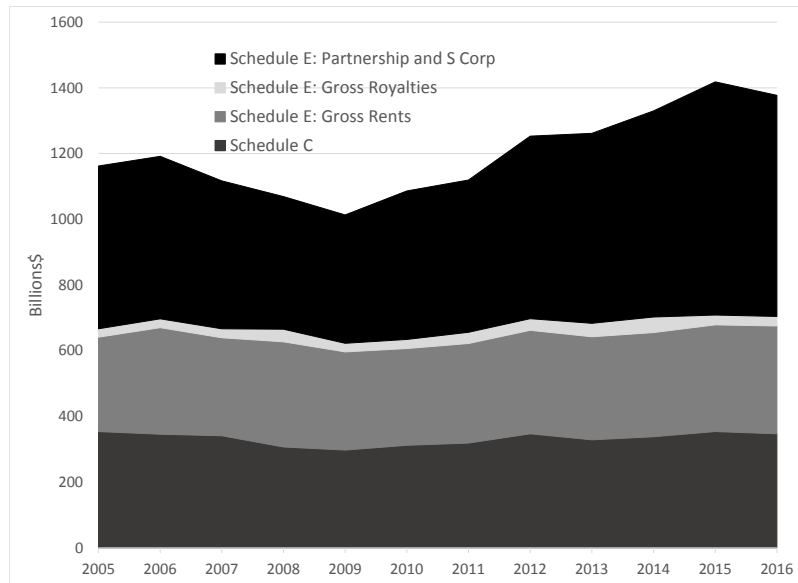
(a) Our Sample
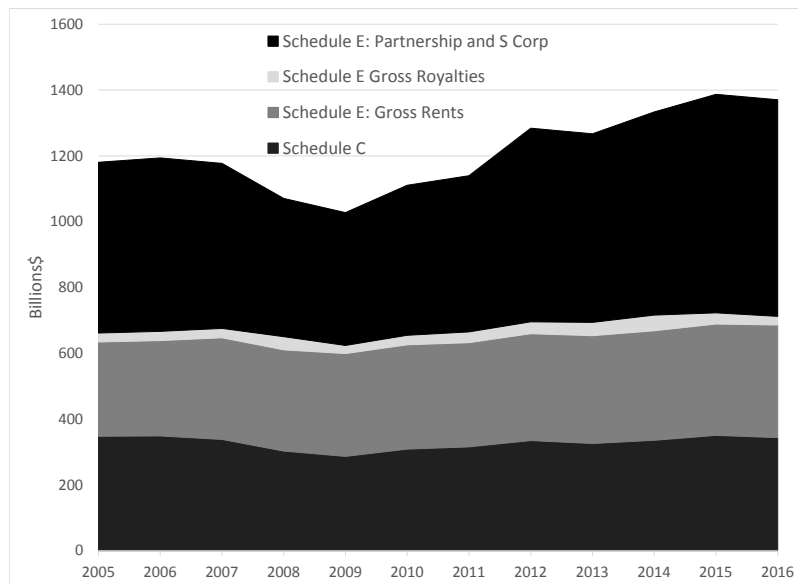
(b) SOI Data

Both panels of the figure show the aggregate amount of income by pass-through type. Panel (a) is derived from a sampling method analogous to our main sample, but applied to earlier years; panel (b) is derived from the Statistics of Income (SOI) data produced by the Internal Revenue Service. Both panels are weighted to represent the full U.S. population. Schedule F income is excluded in both panels because it is negative on net. All dollar amounts are adjusted for inflation to 2018 levels. This figure was created by the authors using data drawn from the population of tax and information returns.

U.S. Department of the Treasury
Office of Tax Analysis
May 2019

III Analysis of the Pass-Through Deduction

In this section, we provide several estimates of the value of the section 199A deduction for pass-through business income had it been applicable in 2016, holding taxpayer behavior and income constant at their 2016 levels, while applying the 2018 tax schedule. We show how estimates of aggregate tax savings are sensitive to our assumptions regarding eligibility. We then provide distributional analysis of the tax savings provided by the pass-through deduction. Throughout the paper, our analysis ignores the Section 199A deductions for qualified Real Estate Investment Trust dividends, qualified publicly traded partnership income, and certain income from co-operatives.

III.A Modeling the Deduction

Several modeling assumptions are necessary to determine what income is eligible for the section 199A pass-through deduction. In some cases there are complex rules for calculating the deduction that demand more information than is available in our data. For example, under the rules of Section 199A, components of the deduction are calculated separately for each of an individual's trades or businesses. Our data, however, are at the business entity level, which may comprise multiple trades or businesses. Conversely, a single trade or business may span multiple tax entities. Because we do not observe each separate trade or business, we approximate the calculation of the deduction as follows. We consider each of a tax unit's top two Schedules K1 and Schedules C to be a separate trade or business. We also consider the residual of "all other Schedules K1" to be an additional trade or business, and likewise for "all other Schedules C." Next, we consider rental income and royalties appearing on Schedule E to each be an additional trade or business. Last, we consider Schedule F to be an additional trade or business. In sum, this gives us up to nine trades or businesses for each individual – three for Schedules K1, three for Schedules C, one for Schedule E rental, one for Schedule E royalties, and one for Schedule F.

Given this split, we calculate the deduction applying the guardrails of the Section 199A deduction for taxpayers with taxable income above $315,000 for married filers and $157,500 for others. The guardrails require assumptions regarding the wages paid by the business, the tangible property held by the business, and whether the business is an SSTB. First, for all taxpayers we determine whether a trade or business produces QBI, which is a function of the business's net income and, for taxpayers above the income threshold, whether the business is an SSTB. Second, if some businesses produce positive QBI and others produce negative QBI, we zero out the negative QBI and allocate this proportionally to the positive-QBI businesses. If total QBI is negative, then there is no current-year 199A deduction and the taxpayer carries this loss forward, reducing the 199A deduction in later periods. We separately record the amount of this carryforward QBI. Finally, for taxpayers above the income thresholds, we apply the wage and capital limitations described in Section I. Once we have computed the 199A deduction at the trade or business level, we aggregate up to the level of the taxpayer to compute the total 199A deduction.

Our approach is imperfect in the following ways. First, we make only a few adjustments to reported taxable income to reflect the major features of the TCJA. In order to better align the 2016 data with the post-TCJA law, we eliminate personal exemptions, apply the $10,000 limitation for the state and local tax deduction, and apply the new standard deduction amounts. However, pre- and post-TCJA taxable income concepts differ in many other aspects that we do not model. In addition, when applying 2018 tax rates, we abstract away from the phase-in and phase-out of tax credits, the alternative minimum tax, and

other features of the tax code that cause statutory rates to diverge from effective rates.[16] Collectively, these unmodeled effects bias our estimates of the deduction amount as well as its corresponding tax savings; however, the signs of these biases are unclear. For some taxpayers the interactions could reduce the value of the deduction, and for others it could increase them.

Second, we use taxpayer- or firm-reported NAICS codes to infer SSTB status. Prior to TCJA, the reported NAICS code has little (if any) effect on tax liability, so the accuracy of these codes is unclear. In addition, the statutory and regulatory definitions of "SSTB" are specific and depend on many aspects of the business that we cannot observe. Furthermore, in the case of the "all other Schedules K1" and "all other Schedules C" trades or businesses, we use a taxpayer-level weighted average of SSTB status, where the weights are given by the absolute value of the top two Schedule C and top two Schedule K1 business incomes. The effect of our inability to accurately determine SSTB status is uncertain. We likely have miscategorized some SSTB and some non-SSTB businesses, but without 2018 data, gauging the relative degrees of misclassification is impossible. In future research, we plan to use post-TCJA tax data to determine how well NAICS codes map to deduction eligibility and examine whether owners change their industry classification on their tax forms.

Third, in the case of income from partnerships and S corporations, our measure of W-2 wages includes only the wages that are recorded on that entity's tax return (Form 1065 or 1120S).[17] It does not include any wages paid by firms owned by that entity (which Section 199A generally allows to be taken into account); such wages are difficult to observe in the pre-TCJA data.[18]r To the extent that we are missing wages, we will overstate the effect of the wage limitation, which will understate the overall cost of the deduction and the tax benefits to high-income taxpayers.

A fourth shortcoming of our approach is the way we estimate the qualified property held by the business. The definition of qualified property in year t is depreciable property used by the business so long as that property was placed in service no more than $max(10, life)$ years ago, where *life* is the standard depreciable life of the property. For instance, nonresidential real estate has a value of *life* equal to 39 years, and residential (i.e., rental) real estate has a value of *life* equal to 27.5 years. For trades or businesses that are S corporations or partnerships, we consider three capital proxies. The first two are directly reported on the entity-level tax return: capital assets and total assets. Total assets are equal to the accounting value of the assets owned by the firm. Capital assets are those that represent physical, depreciable capital such as plants and equipment. The third proxy is based on depreciation reported on the entity-level tax return (plus Section 179 expense passed through to shareholders, which is not recorded on the entity-level return). For sole proprietorships and Schedule E rental income, we do not observe the first two capital proxies, so we use only the depreciation-based proxy. The depreciation-based proxy is calculated as follows: using the Office of Tax Analysis's depreciation model, we compute estimates for two aggregate statistics by entity type for each two-digit-NAICS industry: total depreciation in 2016 and total qualified property under the Section 199A

---

[16]In future iterations of this research, we plan to address this shortcoming by employing microsimulation models to calculate the effect of the pass-through deduction.

[17]For partnerships and S corporations, our measure of wages paid includes the deductions for salaries and wages, and compensation of officers. It does not include wages paid that are reported as part of the cost of goods sold, as we do not observe this.

[18]In the current sample, we have not drawn wages or capital proxies for Schedule E royalties or Schedule F. We assume that all Schedule E royalties represent SSTBs. We assume that all Schedule F businesses are non-SSTB and are not limited by.the wage and ca ipal guatdrails

definition in 2016.[19] We convert observed depreciation to qualified property using the ratio implied by the depreciation model aggregates.[20]

Our modeling of the guardrail based on the qualified property of the business also suffers from some of the same issues as the wages paid measure. We only use property observed in that business, but generally taxpayers are allowed to use capital employed in businesses owned by the entity as well. As with the wages, this causes us to overstate the effect of the guardrails, understating the tax savings from the deduction. To quantify this effect, in an alternative estimate (discussed further below) we allow for aggregation of wages and capital. That is, we allow for excess wages and capital in one trade or business to count towards alleviating the section 199A deduction limitation in another commonly owned business.

Once we have calculated the deduction for the tax unit, we then apply the 2018 rate schedule to our TCJA-adjusted measure of taxable income to calculate tax liability with and without the deduction; the tax savings are equal to the difference. Our baseline estimate, reported in the sixth row of Table 2, is that taxpayers would have claimed $156 billion in deductions in the absence of behavioral responses, yielding total tax savings of $34.5 billion. These estimates are adjusted for inflation to 2018 dollars, as are all dollar values in this section, unless otherwise indicated. For comparison, the Joint Committee on Taxation estimates that the 2019 fiscal year cost (which includes portions of the 2018 and 2019 tax year costs) of the 199A deduction is $47.1 billion (Joint Committee on Taxation, 2017; not adjusted for inflation). The Joint Committee's 2018 fiscal year estimate of $27.7 billion is also informative. It includes only a portion of the 2018 tax year cost and therefore places a lower bound on the 2018 revenue effect (Joint Committee on Taxation, 2017). We note that the Joint Committee's estimates include forecasts of behavioral responses to the deduction, which tend to increase its cost, and their estimates include a richer interaction with other TCJA changes. Furthermore, their estimates include the effects of the Section 199A deductions for qualified Real Estate Investment Trust dividends, qualified publicly traded partnership income, and certain income from co-operatives; our estimate does not.[21]

We also note that our baseline estimate overstates the steady-state no-behavior tax savings. We have implicitly assumed that 2016 is the first year the 199A deduction would have applied in our counterfactual, and therefore taxpayers would have no QBI loss carryforwards. However, in future years, some taxpayers will have such carryforwards, reducing their 199A deduction in those years. To provide a sense of the magnitude of this effect, we estimate that taxpayers would have created $273 billion in carried-forward negative QBI in 2016. If one assumes that half of these carryforwards would ultimately offset future QBI for taxpayers with marginal tax rates of 32 percent, then the future reduction in tax savings is $0.5 \times 0.32 \times 0.20 \times \$273b \approx \$8.7$ billion. Thus a crude estimate of steady-state no-behavior tax savings is $34.5b - $8.7b = $25.8 billion.

We find that the various limitations on the 199A deduction have a large effect on aggregate tax savings. Table 2 breaks out the estimated effects, adding one provision at a time. The first line shows the estimated tax savings with no limitations – i.e., simply allowing a 20 percent deduction for all pass-through business income. We estimate that taxpayers would have enjoyed tax savings of $62.9 billion under such a provision without behavioral responses. In the next row, we add the restriction that the

---

[19]In this case, "entity" can be either S corporation, partnership, or individuals (Schedule C or rental income on Schedule E). In the case of rental income on Schedule E, we use the ratio that applies for "individuals" in the real estate rental industry (NAICS 53), which in the depreciation model is predominantly made up of individuals with rental income on Schedule E.

[20]The Office of Tax Analysis depreciation model is based on tax data sources such as Form 4562. A complete description of the model is outside the scope of this paper.

[21]Another difference is that the Joint Committee's estimate reflects projected 2018 income amounts, which are presumably larger than the (inflation-adjusted) 2016 income amounts that we use.

Table 2: Estimates of hypothetical 2016 static tax savings under different provisions of Section 199A

	2016 Static Deduction (1)	2016 Static Tax Savings (2)	Loss Carryforwards Generated (3)
No limitations:	$261.29 billion	$62.85 billion	$273.24 billion
Add ordinary income limit:	$221.00 billion	$57.38 billion	$273.24 billion
Guardrails:			
Add service restriction:	$162.76 billion	$40.05 billion	$257.72 billion
Add income exception:	$183.46 billion	$44.02 billion	$272.90 billion
Add wage limitation:	$153.18 billion	$33.36 billion	$272.90 billion
Baseline: Add capital exception:	$156.47 billion	$34.50 billion	$272.90 billion
Allow aggregation (upper bound):	$164.00 billion	$37.18 billion	$272.92 billion

Notes: The first column of this table reports the total Section 199A deduction that we estimate 2016 taxpayers could have claimed (holding behavior constant), under various scenarios. In the second column, this amount is converted to changes in tax liability by applying the 2018 statutory tax rate schedule to TCJA-adjusted taxable income (see the text of this section for details). The third column reports the amount of QBI losses that would be carried forward to the following year; this would generally reduce a subsequent year's deduction by twenty percent of this amount. In the first row, there are no limitations: individuals are entitled to a deduction of 20 percent of pass-through income. In the second row, we add the limitation that the deduction cannot exceed twenty percent of ordinary taxable income. In the third row, we add the restriction that SSTBs do not produce QBI. In the fourth row, we allow SSTBs to produce QBI for those with sufficiently low income. In the fifth row, we apply the W-2 wages limitation. In the sixth row, we replace the W-2 wages limitation with the actual limitation, which is the greater of 50 percent of the taxpayer's share of wages or the sum of 25 percent of the taxpayer's share of wages and 2.5 percent of the taxpayer's share of tangible assets. In the final row, we allow taxpayers to aggregate different trades and businesses in a manner that is likely more permissive than actual law. See the text of this section for further discussion of these calculations. All dollar values are adjusted for inflation to 2018 levels and are weighted to represent the full U.S. population. This table was created by the authors using data drawn from the population of tax and information returns.

deduction cannot exceed 20 percent of ordinary taxable income. This applies to all taxpayers, and it reduces the overall benefit to $57.4 billion. Next, we consider the 199A guardrails. We first add the SSTB restriction as if it applied to all income levels, which reduces the benefit to $40.1 billion. Then we incorporate the fact that taxpayers with sufficiently low income are not affected by the SSTB restriction, increasing the benefit to $44.0 billion. This relatively modest change reflects the fact that roughly two thirds of potential QBI is earned by those with income in excess of the relevant thresholds; furthermore, such high-income individuals face higher marginal tax rates and thus receive greater benefits from deductions. Next, we add the provision that limits the deduction to half of the owner's share of W-2 wages (including the income-based exception to this limitation), which reduces the benefit substantially to $33.4 billion. As mentioned above, we do not observe wages paid by upstream tiers of multi-tiered partnerships.[22] We also miss wages that firms report under their cost of goods sold. From 2016 SOI cross-sectional data, which have been edited for accuracy, we estimate that the latter issue affects around 10 percent of partnerships and S corporations. For these firms, the missing wages are substantial, comprising around 65 percent of aggregate wages paid for both partnerships and corporations. Thus a more complete record of wages paid would almost surely reduce our estimate of the effect of the wage limitation, perhaps substantially. Finally, in the sixth row, we arrive at our best estimate of current law by adding in the capital-based exception to the wage restriction. This increases tax savings by a modest

---

[22]We have attempted to trace through the Schedules K1 to find wages paid by higher-tiered entities. However, we were only able to uncover a very small amount of wages through this method.

Table 3: Sensitivity of estimates of hypothetical 2016 tax savings under alternative capital proxies

	2016 Static Deduction (1)	2016 Static Tax Savings (2)	Loss Carryforwards Generated (3)
Baseline proxy: Depreciation-based :	$156.47 billion	$34.50 billion	$272.90 billion
Alt. proxy: Capital assets:	$158.44 billion	$35.17 billion	$272.90 billion
Alt. proxy: Total assets:	$162.32 billion	$36.55 billion	$272.90 billion

Notes: The first column of this table reports the total Section 199A deduction that we estimate taxpayers could have claimed (holding behavior constant), under various proxies for the applicable amount of capital under the 199A guardrails. In the second column, this amount is converted to changes in tax liability by applying the 2018 statutory tax rate schedule to TCJA-adjusted taxable income (see the text of this section for details). The third column reports the amount of QBI losses that would be carried forward to the following year; this would generally reduce a subsequent year's deduction by twenty percent of this amount. The first row repeats the sixth row from Table 2; the capital proxy is equal to depreciation multiplied by an industry/entity-type factor, as discussed in the text of this section. In the second row, we replace this proxy (for partnerships and S corporations) with capital assets from the front page of Forms 1065 or 1120S. In the third row, we replace this proxy (for partnerships and S corporations) with total assets from the front page of Form 1065 or 1120S. All dollar values are adjusted for inflation to 2018 levels and are weighted to represent the full U.S. population. This table was created by the authors using data drawn from the population of tax and information returns.

amount, though the effect is somewhat larger under alternative capital proxies, as shown in Table 3.

In the final row of Table 2, we investigate the effect of the aggregation rules that allow taxpayers to combine different non-SSTB trades or businesses for the purposes of the 199A deduction. This is advantageous to the taxpayer when one business is bound by the wage or capital limitation and another is not, as the excess wages or capital from the latter can be used to increase the deduction from the former. We consider a scenario in which taxpayers can arbitrarily aggregate across all of their non-SSTB trades or businesses. This likely represents an upper bound of the effect of aggregation, since the actual aggregation rules are more restrictive.[23] We estimate that aggregation increases tax savings by up to $2.7 billion, or nearly 8 percent. This suggests that the aggregation rules could reduce the effect of the wage and capital limitations by up to 28 percent ($\frac{37.18-34.50}{44.02-34.50}$).

Overall our analyses show that, absent behavioral responses, the restrictions placed on the 199A deduction have a large effect on estimated tax savings. We find that the 199A guardrails, which apply only to high-income taxpayers, reduced aggregate tax savings by around 40 percent ($\frac{57.38-34.50}{57.38}$). This static exercise provides a useful benchmark that can eventually be compared to the actual effects of the deduction. In future work, we plan to use post-TCJA data to study how behavioral responses change the tax savings associated with the deduction.

III.B   Who Benefits from the 199A deduction?

Thus far we have focused on the aggregate tax savings provided by the 199A deduction. We now turn to distributional analysis, examining the characteristics of both the taxpayers who receive these benefits and the businesses they own. We provide estimates of tax savings stratified by taxpayer income, by entity type, and by industry, elaborating on the analysis of a hypothetical 2016 in which the 2018 tax code applied but there were no behavioral responses to the deduction (or TCJA more generally).

Table 4 shows the estimated tax savings of different income quantiles of adjusted gross income

---

[23]The aggregation rules require common majority ownership and that the businesses meet certain other factors before allowing aggregation.

U.S. Department of the Treasury
Office of Tax Analysis
May 2019

(AGI).[24] The first column shows total pass-through business income, disregarding any entity-level losses. The second column estimates the tax savings with only the limitation that the deduction may not exceed twenty percent of ordinary taxable income (analogous to row two of Table 2). The third column displays our baseline estimate of the tax savings with the 199A guardrails. The fourth column reports the median tax savings (rounded to the nearest $100) among those with positive savings. The fifth column reports a count of taxpayers that own at least one entity with positive income to focus on the group of taxpayers who could potentially benefit from the deduction. The final column reports the share of column five taxpayers that have positive tax savings.

The table shows that those with AGI below the first decile do not receive tax savings. This occurs mechanically because they have no taxable income to offset. This mechanical effect spills into the second and third deciles, where around one quarter and one half of taxpayers with positive pass-through income, respectively, receive a benefit from the 199A deduction. Between the 30th and 95th percentiles, roughly 84 percent of those with positive pass-through income receive tax savings; those who do not are predominantly taxpayers with gains in one business that are outweighed by losses from other businesses.[25] We start to see substantial effects of the 199A guardrails for those between the 95th and 99th percentiles. The guardrails reduce their tax savings from $11.0 billion to $8.4 billion. However, the guardrails predominantly affect taxpayers in the top one percent. Only about half of taxpayers in the top percentile with pass-through business income receive tax savings. Removing the guardrails would more than double their tax savings, from $16.3 billion to $36.6 billion.

The tax savings enjoyed by an income group rises sharply with income, largely concurrent with the concentration of pass-through income. Taxpayers in the top 0.1 percent enjoy an aggregate savings of nearly $8 billion, or about 23 percent of total tax savings from the 199A deduction. This is similar to the aggregate savings for the rest of the top one percent, or taxpayers between the 95th and 99th percentiles. Indeed, we find that 72 percent of the total savings accrues to taxpayers in the top five percent, with 47 percent accruing to taxpayers in the top one percent. For comparison, 60 percent and 44 percent of pass-through income is earned by these groups, respectively. Put differently, the tax savings as a share of (non-negative) pass-through business income for the five AGI quintiles are 0.1, 0.6, 1.2, 1.9, and 2.9 percent (in increasing order of AGI). While higher-income groups are more likely to be limited by the guardrails, lower-income groups are more likely constrained by the ordinary taxable income limitation. Moreover, high-income taxpayers tend to take their deductions against a higher marginal tax rate.

While pass-through income is concentrated at the top of the income distribution, pass-through owners are not. Just over half of all taxpayers with positive pass-through business income are in the bottom six deciles of AGI. Moreover, 76 percent of taxpayers receiving a benefit from the pass-through deduction are outside of the top decile of AGI, and 60 percent are in the bottom four quintiles. Overall, we estimate that around 17.7 million taxpayers would have benefited from the deduction had it been available in 2016. For comparison, the Joint Committee on Taxation estimates that in 2019, 26.8 million taxpayers will claim the deduction (Joint Committee on Taxation, 2019). We cannot determine what drives the discrepancy between our estimate and theirs, as their estimate provides no modeling details. The underlying data, however, appear to be consistent: we estimate that, in 2016, roughly 37 million taxpayers report pass-through income, while the Joint Committee estimates 39.2 million taxpayers with

---

[24]These quantiles are calculated using the 2016 weighted SOI individual cross-section, after eliminating dependent filers and tax units with non-positive AGI. They are adjusted for inflation to 2018 dollars.

[25]Column 5 of the table includes all taxpayers with at least one pass-through business with positive net income, but taxpayers could have negative pass-through income overall. We include such taxpayers because they could potentially receive tax savings if they are high-income and the loss-generating businesses are SSTBs and therefore do not generate QBI.

Table 4: Hypothetical 2016 tax savings, with and without guardrails, by income bins

Income (AGI)	Total business income (bil)	Tax savings			Number with business income (mil)	Percent with tax savings
		Without guardrails (bil)	With guardrails (bil)	Median nonzero savings		
	(1)	(2)	(3)	(4)	(5)	(6)
Negative AGI	56.175	0.000	0.000	.	0.792	0.0%
Decile 1: 0-10,500	24.984	0.000	0.000	.	3.411	0.0%
Decile 2: 10,500-17,300	44.783	0.075	0.075	100	3.221	24.3%
Decile 3: 17,300-24,600	30.859	0.139	0.139	100	1.979	52.2%
Decile 4: 24,600-32,800	31.281	0.260	0.260	100	1.693	84.2%
Decile 5: 32,800-42,700	30.664	0.312	0.312	100	1.704	84.3%
Decile 6: 42,700-55,800	36.869	0.477	0.477	200	1.919	84.6%
Decile 7: 55,800-73,800	47.918	0.866	0.866	200	2.317	84.3%
Decile 8: 73,800-100,000	68.199	1.290	1.289	300	2.806	83.5%
Decile 9: 100,000-147,400	103.380	3.019	3.018	500	3.387	84.9%
90th-95th: 147,400-208,500	95.025	3.397	3.350	800	2.113	86.2%
95th-99th: 208,500-507,500	244.972	10.958	8.373	2,100	2.460	80.5%
99th-99.9th: 507,500-2,248,000	334.157	18.939	8.364	10,200	0.844	47.5%
Above 99.9th: 2,248,000-	288.696	17.646	7.975	71,300	0.118	50.4%
Totals:	1437.962	57.377	34.498	300	28.764	61.7%

Notes: Income (AGI) quantiles are measured using the 2016 Statistics of Income individual cross-section, and are representative of tax units that file a tax return. Quantiles are computed omitted dependent filers and filers with negative AGI. Quantile breaks are rounded for taxpayer privacy. Total business income does not include entities with net losses. Similarly, the counts of those with business income do not include those with only losses. In the table, decile 1 excludes those with negative AGI. All dollar values are adjusted to 2018 dollars, and all figures are weighted to represent the full U.S. population. This table was created by the authors using data drawn from the population of tax and information returns.

Table 5: Hypothetical 2016 tax savings, with and without guardrails, by entity type

Type of business	Total business income (bil) (1)	Tax savings			Number with business income (mil) (5)	Percent with tax savings (6)
		Without guardrails (bil) (2)	With guardrails (bil) (3)	Median nonzero savings (4)		
S Corp	485.742	25.115	17.862	1,000	3.511	83.5 %
Partnership	339.890	13.780	4.316	100	3.812	68.7 %
Schedule C business	421.640	12.532	8.159	200	18.905	64.5 %
Schedule E rental	76.647	2.717	2.197	200	4.480	77.5 %
Schedule E royalties	28.368	0.962	0.222	0	1.730	62.2 %
Schedule F farming	11.662	0.328	0.330	200	0.472	72.3 %
Undetermined S Corp / part.	47.014	1.944	1.412	100	1.069	66.8 %

Notes: Total business income does not include taxpayers with a net business loss in the given entity type. Similarly, the counts of those with business income of a given entity type do not include those with a net business loss in that type. The categories for counts are not mutually exclusive. The category "Undetermined S Corp / part." signifies entities that were not among the top two highest-QBI partnerships or S corporations for the taxpayer. See the text for details about the tax savings calculations. All dollar values are adjusted to 2018 dollars, and all figures are weighted to represent the full U.S. population. This table was created by the authors using data drawn from the population of tax and information returns.

U.S. Department of the Treasury
Office of Tax Analysis
May 2019

Table 6: Hypothetical 2016 tax savings, with and without guardrails, by industry

Industry	Total business income (bil) (1)	Tax savings			Number with business income (mil) (5)	Percent with tax savings (6)
		Without guardrails (bil) (2)	With guardrails (bil) (3)	Median nonzero savings (4)		
Prof. Services	260.337	11.512	5.245[a]	400	3.373[b]	73.2%
Real Estate	225.716	7.481	4.666	200	7.477	68.7%
Finance/Insurance	116.706	5.001	1.908	400	1.473	45.3%
Construction	114.273	4.842	3.934	300	2.377	66.0%
Health	113.417	5.244	1.675	400	1.930	58.5%
Retail Trade	70.075	3.312	2.997	300	1.552	64.8%
Manufacturing	62.378	3.241	2.784	500	0.475	71.3%
Other Services	55.544	1.398	1.227	200	3.158	55.4%
Wholesale Trade	51.865	2.419	1.971	600	0.460	71.4%
Arts/Entertainment	35.693	1.446	0.341	100	0.985	62.0%
Admin./Support	34.857	1.187	0.995	200	1.481	57.3%
Transportation	32.191	0.875	0.763	100	1.462	54.5%
Accomodation/Food	28.201	1.172	1.094	400	0.611	67.6%
Agriculture	28.049	0.888	0.723	200	0.935	64.1%
Holding Companies	19.161	0.840	0.325	300	0.131	49.0%
Information	12.578	0.571	0.403	300	0.297	68.9%
Mining, Oil/Gas	8.605	0.297	0.170	100	0.299	43.6%
Education	7.010	0.266	0.234	100	0.491	72.6%
Utilities	1.589	0.044	0.036	200	0.022	58.8%

Notes: Observations are at the owner-by-business level, restricted to those businesses for which we observe a valid industry. Tax savings are calculated using the largest K1 first, followed by the second largest K1, followed by all other K1s, followed by the largest Schedule C, followed by the second largest Schedule C. An tax unit can be included in multiple rows of this table if he or she owns businesses in different industries. Industries are at the two-digit NAICS level. All dollar values are adjusted to 2018 dollars, and all figures are weighted to represent the full U.S. population. This table was created by the authors using data drawn from the population of tax and information returns.

[a]Within this industry (NAICS 54), 65.1% of the savings accrue to those below the top of the income phaseout.
[b]Within this industry (NAICS 54), 90.7% of those with savings are below the top of the income phaseout.

pass-through income for 2019 (Joint Committee on Taxation, 2019).

In Table 5 we break out the tax savings for owners of different types of entities. A given individual's tax savings could contribute to multiple rows of this table if he or she owned multiple entity types. The vast majority of positive pass-through business income comes from S corporations (at least $486 billion), Schedule C businesses ($422 billion), and partnerships (at least $340 billion). We estimate there are roughly 18.9 million taxpayers with positive Schedule C income, and at least 3.5 million taxpayers with positive S corporation income and 3.8 million with positive partnership income, though some taxpayers are included in multiple categories. In aggregate, taxpayers are expected to receive $8.2 billion in tax savings from their Schedule C businesses.[26] If we portion out the undetermined S corporation and partnerships tax savings according to their share of identifiable business income, then taxpayers are expected to receive $18.7 billion and $4.9 billion, respectively, from their S corporations and partnerships. Median tax savings (among those with a positive savings) across all business types are quite low, with the exception of S corporation owners, whose median savings is $1,000.

Table 5 also shows that some entity types are more affected by the 199A guardrails than others. Tax savings provided by partnerships fall by 69 percent due to the guardrails, while savings provided by S corporations and Schedule C businesses are only reduced by 29 and 35 percent, respectively. Relative to other entity types, partnerships are more affected by both the SSTB guardrail and the wage and capital guardrail.

Finally, in Table 6 we examine how the estimated savings are distributed across different industries. As in the previous table, a given individual can be included in multiple rows of this table if they owned multiple businesses. For sole proprietorships, we use the NAICS codes reported on Schedule C. For Schedules K-1, we link the K-1 to the corresponding Form 1065 or 1120S which contains the NAICS code for the business. We report the same columns as in the previous two tables.[27]

The top five industries, in descending order of pass-through business income, are professional services (e.g., legal services, accounting services, and consulting), real estate, finance/insurance, construction, and healthcare. The effects of the guardrails are quite heterogeneous by industry. In particular, the guardrails reduce the tax savings by 59 percent in the professional services, finance/insurance, and healthcare industries. This accounts for over half of the guardrails' total reduction in tax savings.

The guardrails' effects are heterogeneous for three reasons. First, and most obviously, the likelihood of being classifed as an SSTB varies by industry. Second, different industries have different wage and capital mixes. Third, the income distributions of owners also vary by industry. For example, the guardrails reduce the tax savings for the healthcare industry by about 70 percent, while they reduce the tax savings for construction by only about 20 percent. This largely reflects the fact that most healthcare businesses are classified in our algorithm as SSTBs. Nevertheless, industries that contain many SSTBs such as professional services and healthcare still see significant savings. This is in part because some sub-industries are not SSTBs (e.g., testing facilities within the broader healthcare industry) and because many taxpayers with SSTBs fall below the income phaseout threshold. Of note, the share of individuals with positive tax savings is fairly constant across industries, reflecting the fact that most beneficiaries of 199A are below the income thresholds, even if these individuals do not receive the bulk of income

---

[26]Because tax rates are not constant, this calculation requires a "stacking" assumption. In particular, we calculate tax savings for the top two highest-QBI S corporations and partnerships first. Then we calculate tax savings for the "all other K1s" category, reported in the table as "Undetermined S Corp / part", against the lower remaining income. We continue this process for Schedule C businesses, Schedule E rental, Schedule E royalties, and Schedule F farming, in that order.

[27]Like Table 5, this table requires a stacking assumption. We follow the same order as in Table 5. Within S corporations/partnerships and Schedule C businesses, we use the largest of that type, followed by the second largest, followed by the residual.

affected by 199A.

IV Conclusion

This paper presents preliminary evidence on the pass-through deduction created by the Tax Cuts and Jobs Act. In 2016, roughly 37 million tax units reported nonzero pass-through income. Of these, about 29 million had at least one pass-through business with positive income. Our analysis suggests that the majority of the latter group (around 17.8 million) would have been eligible for the pass-through deduction had it applied. After adjusting 2016 taxable income to account for the largest provisions of TCJA and applying 2018 tax rates, we estimate the aggregate tax savings to be \$34.5 billion (measured in 2018 dollars). The tax savings would be nearly twice as large – \$62.9 billion – but for the limitations included in Section 199A, including the guardrails that curtail the deduction for some high-income tax-payers. In the steady state, the no-behavior tax savings would be further reduced, as prior-year negative QBI carryforwards would offset some of current-year QBI. Assuming that half of these carryforwards would ultimately offset future QBI for taxpayers with marginal tax rates of 32 percent, we arrive at a crude estimate of steady-state no-behavior tax savings of \$25.8 billion.

Because pass-through income is relatively concentrated among high-income taxpayers, the tax savings from 199A are also relatively concentrated. Taxpayers at or above the 95th percentile of income earn 60 percent of the business income and are estimated to receive 72 percent of the benefits. The bulk of the savings accrue to taxpayers with S corporation, Schedule C, or partnership income. Estimated tax savings are largest in professional services, real estate, construction, retail and wholesale trade, and manufacturing, and the effects of the guardrails are heterogeneous across industries.

The introduction of the 199A deduction has the potential to increase total pass-through income via a combination of expanding economic activity and shifting economic activity into pass-through form. Real responses could include entry of new pass-through businesses (Gentry and Hubbard, 2000, 2005), more risk-taking in existing businesses due to asymmetric treatment of gains and losses (Cullen and Gordon, 2007), and increased investment. Additionally, the profits of many pass-through businesses are derived in large part from the labor supply of their owners (Smith et al., 2017); thus, Section 199A could affect pass-through income by increasing the labor supply of owners (Keane, 2011). Options for shifting income to take advantage of the pass-through deduction include reclassification of existing employment relationships as independent contracting relationships, and adjustments to the split be-tween wage compensation (guaranteed payments) and business income for active S corporation owners (partners).

The rules governing the deduction create a number of cutoffs and limitations which may enable identification of these behavioral responses. In addition, they create their own incentives for real and shifting responses. For example, high-income business owners may increase wage payments or acquire tangible property in order to avoid limitations on the 199A deduction. In future work, we plan to study these issues as well as the behavior induced by the broader 199A incentives discussed above to gain a deeper understanding of how taxpayers respond to this provision.

References

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.

Cullen, Julie Berry, and Roger H Gordon. 2007. "Taxes and entrepreneurial risk-taking: Theory and evidence for the US." *Journal of Public Economics*, 91(7-8): 1479–1505.

Gentry, William M., and R. Glenn Hubbard. 2000. "Tax policy and entrepreneurial entry." *American Economic Review*, 90(2): 283–287.

Gentry, William M., and R. Glenn Hubbard. 2005. "" Success Taxes," Entrepreneurial Entry, and Innovation." *Innovation Policy and the Economy*, 5: 87–108.

Joint Committee on Taxation. 2017. "Estimated Budget Effects of the Conference Agreement for H.R. 1, The 'Tax Cuts and Jobs Act'." JCX-67-17.

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

Keane, Michael P. 2011. "Labor supply and taxes: A survey." *Journal of Economic Literature*, 49(4): 961–1075.

Larrimore, Jeff, Jacob Mortenson, and David Splinter. 2017. "Household incomes in tax data: Using addresses to move from tax unit to household income distributions." Finance and Economics Discussion Series 2017-002. Washington: Board of Governors of the Federal Reserve System, `https://doi.org/10.17016/FEDS.2017.002`.

Smith, Matthew, Danny Yagan, Owen Zidar, and Eric Zwick. 2017. "Capitalists in the 21st Century." Society for Economic Dynamics.