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Working Paper

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WIDER Working Paper, No. 64/25

Provided in Cooperation with:

United Nations University (UNU), World Institute for Development Economics Research (WIDER)

Suggested Citation: Riedel, Nadine; Sicking, Franziska; Zinke, Ida (2025) : Tax code complexity, tax adviser services, and firm outcomes: Evidence from South Africa, WIDER Working Paper, No. 64/25, ISBN 978-92-9267-623-0, The United Nations University World Institute for Development Economics Research (UNU-WIDER), Helsinki,
<https://doi.org/10.35188/UNU-WIDER/2025/623-0>

This Version is available at:

<https://hdl.handle.net/10419/331469>

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Tax code complexity, tax adviser services, and firm outcomes

Evidence from South Africa

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September 2025

Abstract: We study the impact of tax preparers on corporate tax optimization in South Africa. The analysis draws on the population of corporate income tax returns linked to data on tax preparer use. Consistent with tax code complexity and frictions in the take-up of tax advantages, we document that firms' reported taxable income and tax payments decline significantly when they start utilizing tax preparer services. Additional analyses provide direct evidence that the use of a tax preparer increases the take-up of legal tax benefits: eligible firms become more likely to seek access to a regime with special low tax rates; they are more likely to claim an employment tax incentive (ETI) for young workers and to run losses (which can be offset against future profits). Our findings, on the one hand, imply that tax adviser services are instrumental in reducing frictions in corporate income taxation. In the context of the ETI, they increase the effectiveness of the tax incentive in stimulating the employment of young workers. On the other hand, tax preparers are shown to drive a wedge between the tax costs of firms that do and do not rely on their services, which may be a source of inefficiency and inequities.

Key words: taxation, frictions, tax adviser services

JEL classification: H24, H31, H83

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This study has been prepared within the UNU-WIDER project **Southern Africa—Towards Inclusive Economic Development (SA-TIED)**.

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ISSN 1798-7237 ISBN 978-92-9267-623-0

<https://doi.org/10.35188/UNU-WIDER/2025/623-0>

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The Institute is funded through income from an endowment fund with additional contributions to its work programme from Finland and Sweden, as well as earmarked contributions for specific projects from a variety of donors.

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The views expressed in this paper are those of the author(s), and do not necessarily reflect the views of the Institute or the United Nations University, nor the programme/project donors.

1 Introduction

It is a standard assumption in public economics that the economic and distributional impact of taxes is as designed by legislators in tax law. Implicitly, this presumes universal take-up of tax deductions, credits, and special tax schemes by eligible taxpayers. This may not be a valid description of real-world settings, in particular if tax legislation is characterized by a considerable degree of complexity. Information frictions and filing costs may hamper the application of tax rules. Taxpayers might lack familiarity with the tax code and reliable information on tax rules, exemptions, and deductions. Or they may need to exert time and monetary costs to deal with the paperwork to obtain access to certain tax benefits, which may disincentivize take-up. Understanding frictions in the application of tax regulations is highly important from a policy perspective, as they divert the level and distribution of tax burdens from legislatively intended ones and can reduce the effectiveness of tax incentives in steering taxpayer behaviour.

Tax preparers act as intermediaries between taxpayers and the government sphere in this context. They provide expert knowledge on tax legislation and offer tax reporting services. Through specialization advantages, they can help keep information frictions in complex tax systems at bay and diminish filing and documentation costs. But their effect on fiscal and economic outcomes hinges on their effectiveness in dealing with tax frictions. If tax preparer markets are not tightly regulated and tax preparer quality is less than perfect, tax advisers may add relatively little to overcome tax rule complexity. What is more, they may drive a wedge between the effective tax costs of firms with and without tax preparers—which may be a source of inefficiencies and inequities, undermining uniform taxation and distorting product market outcomes.¹

In this paper, we study frictions in corporate taxation and the role of tax preparers in shaping firm outcomes in South Africa. Our empirical analysis relies on the universe of corporate tax returns in South Africa linked to information on firms' use of tax preparer services. We show that relying on a tax preparer is associated with significant tax cost reductions and we provide direct evidence that the take-up of tax preparers enhances the use of tax benefits and tax incentive programmes. Tax preparers are also documented to enhance the effectiveness of tax incentives in steering socially desirable behaviour. As indicated above, tax service intermediation hence reduces information and filing frictions in the tax domain, but does so non-homogeneously as not all firms rely on tax preparer services.²

¹ In monopolistic competition models, lower effective tax costs of firms with tax preparers translate into lower output prices and higher market shares, at the expense of firms without a preparer.

² Our findings render it unlikely that tax frictions are absent for firms without tax preparer use—this is, at elevated rates, smaller entities, which show large responses to tax preparer take-up.

Methodologically, the analysis draws on a difference-in-differences design, which compares outcome trends across treated firms, which start using a tax preparer at a given point in time, and control firms, which refrain from tax preparer use. Our granular data allows us to corroborate the common trend assumption underlying our empirical identification strategy and thoroughly address identification concerns related to the endogeneity of firms' decisions to make use of tax adviser services. Among others, we flexibly control for changes in firm size, which may—as tax preparer costs are plausibly partly fixed in nature—shape tax preparer take-up and may simultaneously impact firms' tax outcomes. We also non-parametrically absorb differences in outcome trends across firms in different granular industries, municipalities, and firm-size classes to filter out potential confounders. In complementary model specifications, we rely on matching strategies to balance treatment and control groups in observed characteristics. We also estimate dynamic difference-in-differences models, which corroborate that outcomes of treated and control firms emerged in parallel prior to treatment—thus, for example, dampening concerns that firms might start drawing on tax preparer services in response to corporate tax payment hikes. Since we draw on a staggered treatment design, the analysis further documents that our estimates are robust to relying on estimators, which are robust to dynamic and heterogeneous treatment effects (see, for example, Roth et al. 2023 for a discussion).

We derive three key findings. First, we show that using a tax preparer significantly lowers firms' reported taxable incomes and tax payments. The estimated effect is quantitatively sizeable: using a professional tax preparer reduces reported taxable income normalized by assets by 10% of a standard deviation.

In a second set of results, we document imperfect take-up of corporate income tax benefits in South Africa and provide direct evidence that relying on a professional tax adviser increases the propensity of corporate taxpayers to make use of favourable tax rules, which lower their effective tax burden. We account for tax provisions in three domains:

- First, the so-called small business corporation tax scheme, which grants South African firms with revenue below ZAR20 million—subject to a number of further criteria—access to marginal income tax rates below the country's headline corporate tax of 28%, in an attempt to encourage entrepreneurship and business formation and to foster firms' transition from the informal to the formal economy.
- Second, the employment tax incentive (ETI), which grants subsidies to firms employing young workers aged 18–29 years, in an attempt to incentivize firms to hire young South Africans and to counter the high youth unemployment in the country.
- Third, loss carry-forward provisions, which allow companies to offset losses against future profits, in an attempt to design a neutral corporate income tax system—among others avoiding tax discrimination against firms and projects with variable payout paths

(e.g. business projects that run losses in investment phases and only earn profits in later years).

We document that relying on the services of a tax preparer increases the propensity of corporate taxpayers to make use of the sketched tax provisions. The propensity to be taxed under the SBC scheme increases by around 8%, with even larger effect sizes if the sample is restricted to smaller entities. The propensity to file ETI claims increases by around 7% and the propensity to file a loss by around 23%. The latter finding is consistent with Zwick (2021), who documents frictions in the use of tax loss-offset provisions in the US. If firms without professional tax support are unaware of the possibility to carry forward losses and if lowering reported taxable income involves costs (e.g. related to filing and documenting tax deductions), businesses may refrain from minimizing their reported taxable income beyond zero at higher rates if they do not draw on tax preparers.

These findings suggest that tax preparers help their clients navigate the complexity of the corporate income tax system and to make use of legal provisions that allow them to lower their corporate tax burdens. By their intermediation, tax law is more effectively transmitted to real-world settings: effective tax costs get closer to the legally intended rates.³ Tax practitioners may also foster the effectiveness of tax incentives: we show that the use of a tax preparer does not only increase the propensity that firms claim tax credits for ETI-eligible workers, it also increases firms' propensity to *hire* eligible workers. Tax preparers, moreover, foster the workings of loss-offset provisions, which serve an important role in the tax system—among others, dampening adverse tax effects on company investment, such as during phases of recovery from economic recession.

On the downside, however, our findings also highlight that tax intermediation leads to a divergence of the effective tax costs for taxpayers who do and do not draw on tax preparer services—which might, in turn, as described above, come with its own inefficiencies and inequities. It follows that businesses face different tax costs, depending on whether they use a tax preparer or not; this may be shaped by supply-side factors (e.g. regional scarcity of tax preparers, which has been a concern in South Africa for some years, with accountants leaving the country for job opportunities abroad—see e.g. BusinessTech 2024⁴) and demand-side factors (e.g. limited incentives of smaller firms to make use of tax preparer services because of their fixed cost nature).

³ This abstracts from the possibility that tax preparers might support their clients to engage in illegal tax evasion. We consider this relatively unlikely as, in South Africa, tax practitioners certified by accounting bodies and SARS are bound by tight ethical standards and regulations. They are also not allowed to operate as a certified tax practitioner if they have engaged in tax evasion or other serious tax offences.

⁴ Tax and accounting has featured on the 'Critical Skills List' of the Department of Home Affairs of South Africa, which aims to attract foreign professionals with locally scarce skills into South Africa to resolve economic bottlenecks resulting from skill shortages.

Our findings emphasize the importance of governments considering policies that help reduce frictions in taxation—from taxpayer information programmes to exploiting new options related to digitization and artificial intelligence, which may help to lower filing costs and information frictions even in the absence of tax preparer use—for example, the pre-filing of tax returns or the development of free and broadly accessible chatbots, which can support taxpayers in their tax affairs.

Our paper contributes to a small literature on tax complexity and the role of tax preparers in supporting taxpayers to deal with complexity-related tax frictions. A number of recent papers have documented complexity in the income tax systems of different countries and their evolution over time (see e.g. Schanz et al. (2025) for corporations and Benzarti and Wallossek (2024) for individuals) and estimated the size and consequence of compliance costs—commonly in specific settings, such as relating to the take-up of certain tax provisions (Chetty and Saez 2013; Harju et al. 2021; Kopczuk and Pop-Eleches 2007) or the submission of tax returns by individual taxpayers (Hauck and Wallossek 2024).⁵ Our paper closely relates to Zwick (2021), who documents low take-up rates of loss carry-backwards provisions among eligible US firms and shows that the use of high-quality tax preparers significantly increases these take-up rates. Our paper, moreover, is connected to Boning et al. (2020) and Battaglini et al. (2020), who provide evidence that tax preparers accumulate information on tax authorities’ tax audit behaviour and use it in their counselling practice.

We add to this scarce literature by providing evidence on tax frictions and tax preparer use based on rich administrative data. One particularity of our study is that we are, to the best of our knowledge, the first paper to study tax complexity and the role of tax preparers in a lesser-developed country context.⁶ This helps to close an important gap in the literature as it is not a priori clear that the scarce insights on corporate tax complexity and tax preparer markets from developed countries carry over to the developing world. Differences in economic development, institutional quality, taxpayer education, digitization of tax services, tax authorities’ enforcement capacity, and the regulation of tax preparer markets may well limit the external validity of prior findings for emerging and developing country settings.

The rest of the paper is organized as follows: Sections 2 and 3 offer institutional background and present the data underlying our empirical work. Section 4 discusses the empirical methodology. Sections 5 and 6 present our findings. Section 7 offers brief further discussion, and Section 8 concludes the paper.

⁵ More broadly, our paper relates to (1) the literature on the salience of taxation (for seminar work, see e.g. Chetty et al. 2009); and (2) the literature on the take-up of public programmes (Currie 2006; Moffitt 2007).

⁶ Lediga et al. (2025) is complementary to our work; these authors document that audit information is absorbed by tax preparers and impacts the tax reporting of their clients.

2 Institutional background

South Africa is an upper-middle-income country with a GDP per capita of US\$6,253 in 2023 (World Bank 2024). South Africa featured a tax-to-GDP ratio of around 25% in 2023, with corporate income taxation (CIT) contributing 20.43% to total tax revenue in tax year 2023 (National Treasury, Republic of South Africa 2024). Corporations are taxed at a headline CIT rate of 28%. Smaller entities that qualify as ‘small business corporations’ (SBCs) are subject to a progressive tax system with lower rates (see below for further details). Corporate taxable income includes all income generated within the considered tax year. Deductions and various tax credits apply—comparable to other countries—such as allowing companies to tax-deduct investment costs and interest payments from the tax base. Moreover, tax incentives apply (e.g. for R&D and investment in renewable energy). South African tax law permits companies to carry forward tax losses indefinitely, enabling them to offset these losses against future taxable income (while carry-backwards is not allowed—see e.g. Wier 2020).⁷

Companies are required to submit comprehensive tax returns to the South African Revenue Service (SARS), in which they detail all assessable income and deductions. SARS requires companies to submit returns within 12 months of the end of the tax year.⁸

Corporate taxpayers in South Africa can draw on tax practitioners to help them meet their tax obligations. Under the Tax Administration Act 28 of 2011 (Government of South Africa 2011), the term ‘tax practitioner’ encompasses a broad range of professionals who provide tax-related services, including accountants, tax advisers, and legal practitioners specializing in tax law. Section 240 of the Act defines tax practitioners as individuals who offer advice on the application of tax laws or assist in completing tax returns on behalf of others. The Act mandates rigorous qualifications and continuous professional education requirements for tax practitioners. In South Africa, all tax practitioners must register with SARS within 30 days of providing tax-related services. Further, since July 2013, tax practitioners must also register with a ‘Recognized Controlling Body’ (RCB) (South African Revenue Service 2024a). For registration, all tax practitioners must complete the SARS Tax Practitioner Readiness Programme, meet specific educational thresholds, and accumulate relevant work experience. Additionally, they are required to maintain tax compliance and adhere to the codes of ethics prescribed by their controlling bodies, ensuring that they uphold high professional standards.⁹

⁷ An assessed loss restriction was introduced for years of assessment commencing on/after 1 April 2022.

⁸ In South Africa, the tax year runs from the beginning of March to the end of February in the following year. For example, tax year 2018 started on 1 March 2017 and ended on 28 February 2018.

⁹ These measures were introduced to address issues of non-compliance and misconduct within the profession, as well as to protect taxpayers from unscrupulous practices (Akinboade et al. 2015; Ndlovu and Schutte 2024).

3 Data

The empirical analysis draws on tax administrative panel data from South Africa, which comprises the universe of corporate tax returns submitted by South African firms, linked to information on firms' tax practitioner use. The data is provided by the SA-TIED programme through a cooperation between the United Nations University World Institute for Development Economics Research (UNU-WIDER), SARS, and National Treasury (National Treasury and UNU-WIDER 2025).

The corporate income returns comprise information on firms' taxable income, tax payable, and use of tax deductions and credits. We draw on information for the tax years 2010–20, for which both the CIT return information and data on tax practitioner use is available.¹⁰ Information on tax practitioner use stems from the CIT returns, where firms are required to provide the unique tax registration identification number of their tax practitioner, of which we can access an anonymized version. We apply the standard cleaning steps. Most importantly, we drop dormant firms from the data and exclude a small set of observations where firms report a positive taxable income that is smaller than their tax liability (0.01% of the data).

Our dataset comprises 500,000–600,000 firms per year, with the number of firms increasing over time. The number of tax practitioners shows a declining trend over time. While there were around 23,000 tax practitioners in 2012, there were only 15,000 in 2018 (see Table 1). Analogously, there is a decline of firms that rely on a tax practitioner, from around 65% in 2012 to around 53% in 2018. There are different potential reasons for this decline: corporate tax forms were simplified for smaller entities in 2014, potentially facilitating tax filing; moreover, SARS tightened requirements for tax preparer qualifications, requiring tax practitioners to be members of a registered controlling body (e.g. the South African Institute for Taxation); other potential reasons include that the advancing digitization during our sample frame offers firms new options to reduce tax filing costs, as does the emergence of web-based services that offer options for firm owners to inform themselves about legal tax regulations. This implies that—when studying the impact of tax practitioner take-up on firm behaviour—this effect may vary over time. If tax preparer quality improved over time, for example, we would expect that the effect of tax preparers on the tax reporting of their clients increased over time, too (in absolute terms). The same would hold true if firms with less benefit from tax preparer services dropped out of tax preparer use over time. We will assess this possibility in our empirical analysis. See Table 1 for our descriptive statistics. The analysis to come draws on variation related to tax practitioner take-up, and the last column of Table 1 depicts the fraction of firms, by tax year, that start using a tax practitioner for the first time during our data frame (this fraction is therefore smaller than the total fraction of firms that rely on tax preparer services).

¹⁰ Due to COVID-19 and lack of data, we exclude tax years after 2020.

Table 1: Descriptives

Tax year	Number of firms	Number of tax practitioners	Share of firms with tax practitioner (%)	Share of firms starting to use a tax practitioner (%)
2010	552,289	21,811	69.46	—
2011	530,200	22,348	68.81	7.97
2012	526,940	23,269	65.42	7.40
2013	519,875	22,203	63.71	6.46
2014	519,248	18,038	62.71	5.57
2015	526,062	15,726	61.06	5.47
2016	578,083	16,037	58.04	6.71
2017	606,034	15,827	55.81	5.86
2018	631,097	15,430	52.89	5.68
2019	660,212	14,764	45.82	4.79
2020	651,489	13,008	40.34	3.85

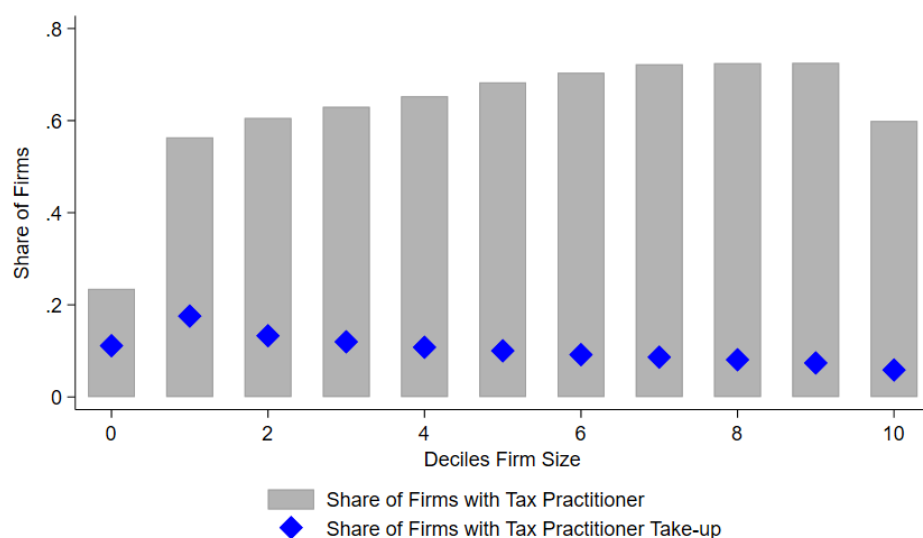
Note: the table depicts the number of firms and the number of tax practitioners per tax year, as well as the share of firms per year that start using a tax preparer for the first time.

Source: authors' compilation.

Figure 1 depicts tax preparer use by firm size, measured by deciles of the asset distribution, where 0 marks firms that report zero assets. The figure shows that tax preparer use increases with firm size, consistent with the notion that the costs for tax preparer services include a fixed cost component. At the very top of the income distribution, the fraction of firms with a professional tax preparer shrinks again, likely reflecting that some large firms rely on in-house tax services. In the analysis to come, we will therefore drop the largest firms from the data (see further below for details), which is not decisive for our qualitative results—our quantitative estimates are shown to become larger when the sample is restricted to smaller firms, consistent with the notion that smaller businesses are more strongly affected by information and filing frictions than their larger counterparts, with more scope for in-house specialization and assignment of personnel to tax-related tasks.

As our empirical strategy relies on variation stemming from the take-up of tax practitioner services, Figure 1 also shows the fraction of firms that do not rely on tax practitioner services at the outset of the sample frame or in the year in which they enter the data, but take up a tax practitioner within our sample period. Intuitively, the fraction is somewhat larger at the lower end of the firm size distribution, but even in the middle and upper end, our data includes firms that newly start relying on tax practitioner services. In the Appendix we show the variation of tax practitioner reliance across industries (Figure A2) and municipalities (Figure A3).

Figure 1: Tax practitioner use and take-up by deciles of assets in 2012



Note: the grey bars depict the fraction of firms in a given asset size group (zero and asset deciles, conditional on assets > 0, respectively) that rely on professional tax preparer services. The blue diamonds indicate the fraction of firms in the size group that start using tax preparer services for the first time during our data frame (treated group).

Source: authors' compilation.

Table 2 presents descriptive statistics for our main data, comparing treated firms—which newly take up a tax practitioner during our data frame—to control entities without tax preparer use. While the broad descriptive patterns are comparable across the two sets of entities, there are a number of marked differences (e.g. related to firm size, the location of businesses, and industry affiliation). We will take care in the empirical analysis to come to filter out potential differences in trends of tax outcomes across industries, regions, and firm size, which might otherwise act as confounders in the empirical analysis.

Table 2: Summary statistics

	Treatment group	Control group
Total firms	81,185	550,739
Size indicators	Mean	
Firm age	5.4468	3.1127
Assets	6,881,831	3,292,257.3
Sales	5,075,509.5	1,520,183.9
Taxable income	-268,522.6	-115,604.6
Tax payment	213,527.59	250,052.28
Number of employees	47.5063	92.7198
Company type	Share	
Share block company or body corporate	0.0234	0.0736
Micro business	0.8211	0.8376
Small business	0.0681	0.0494
Medium to large business	0.0259	0.0166
Province	Share	
Western Cape	0.0724	0.0587
Eastern Cape	0.0282	0.0646
Northern Cape	0.0094	0.0136
Free State	0.0172	0.0214
KwaZulu-Natal	0.0704	0.1352
North West	0.0180	0.0341
Gauteng	0.2131	0.3389
Mpumalanga	0.0236	0.0476
Limpopo	0.0211	0.0555
Industries (One-digit code)	Share	
(0) Private households, extraterritorial organizations, representatives of foreign governments, and other activities	0.0056	0.0126
(1) Agriculture, hunting, forestry, and fishing	0.0344	0.0492
(2) Mining and quarrying	0.0101	0.0095
(3) Manufacturing	0.0601	0.0403
(4) Electricity, gas, and water supply	0.0092	0.0090
(5) Construction	0.1439	0.2305
(6) Wholesale and retail trade; repair of motor vehicles, motorcycles, and personal and household goods; catering and accommodation	0.1736	0.1359
(7) Transport, storage, and communication	0.0433	0.0374
(8) Financial intermediation, insurance, real estate, and business services	0.2813	0.1494
(9) Community, social, and personal services	0.2013	0.2106

Note: the table shows descriptive statistics for our main sample of firms. The treatment group is firms that newly take up a tax practitioner during our sample frame; control firms are entities without a tax preparer throughout our sample frame.

Source: authors' compilation.

4 Methodology

The aim of the analysis is to study the impact of tax practitioners on firm outcomes in South Africa. In the base analysis, we assess their impact on firms' tax reporting. In later analyses, we zoom in and study the impact of tax practitioners on the take-up of particular tax benefits

in the South African tax system. Methodologically, we rely on a difference-in-differences (DiD) design and—as already sketched above—compare the evolution of tax reporting outcomes of treated firms, which start using a tax preparer at a given point in time, to control firms, which refrain from relying on tax adviser services. As described above, we drop firms that rely on tax preparer services throughout the whole data frame from the analysis. Formally, our estimation model reads

$$Y_{it} = \alpha + \beta \cdot \text{Treat}_{it} + \gamma X_{it} + \lambda_i + \rho_t + \varepsilon_{it} \quad (1)$$

where Y_{it} is the tax outcome of firm i in tax year t . We rely on firms' taxable income and tax payable, normalized by assets, as well as the inverse hyperbolic sine-transformed level of tax payments.¹¹ Estimates from regressions with inverse hyperbolic sine-transformed dependent variable have been shown, however, to be unit-sensitive, preventing a straightforward quantitative interpretation (Chen and Roth 2024; Mullahy and Norton 2024). The reliance on asset normalized outcomes in the base model follows recommendations to deal with this challenge (see Chen and Roth 2024). Treat_{it} is a dummy variable indicating tax practitioner use of firm i in tax year t . λ_i is a full set of firm fixed effects, ρ_t captures time fixed effects and X_{it} a set of control variables (to be specified in detail further below). ε_{it} depicts the error term.

The parameter of interest is β , which captures the impact of tax preparer take-up on firms' tax reporting. Retrieving a causal estimate for β hinges on the standard common trend assumption of the DiD design: it is assumed that tax outcomes of treated and control firms would have emerged in parallel in the absence of treatment. As tax preparer take-up is not necessarily random but may correlate with firm characteristics, we take great care to absorb potential underlying differences across treated and control firms. If tax advisory service costs are characterized by fixed costs, it may, for example, pay for firms to start using tax advisory services when they grow and their operations become more complex. To the extent that firm size also impacts tax outcomes, this may act as a confounder in the analysis (at least in specifications where income reporting and taxes payable are not normalized by assets).¹² We therefore control for firm size-related effects by several means in the estimation model (in the X_{it} vector): we include the log of firms' assets as a size control; in alternative specifications, we model firm size deciles, allowing for potential non-linear effects on tax outcomes; and firm size growth, which absorbs potential confounders—for example, related to changes in asset size and tax depreciation.

¹¹ Inverse hyperbolic sine transformation comes with the benefit that observations with zero realizations are not dropped from the analysis.

¹² Note, however, that headline corporate taxation is proportional, therefore implying that there is no mechanical link between firm size and effective tax costs.

Following the argumentation in the prior section, we, moreover, levy our rich data and granularly absorb differences in outcome trends across firms' four-digit industries, South African municipalities, and firm size deciles.

In complementary specifications, we rely on matching strategies: coarsened exact matching and nearest-neighbour propensity score matching (with a calliper of 0.2). Coarsened exact matching precisely matches on municipality–two-digit industry and firm size decile cells, thus comparing highly similar firms that do and do not take up a tax practitioner at a specific point in time. In some specifications, we also restrict the set of firms to entities that start using a tax preparer during our sample frame, thus identifying the effect of interest by comparing firms that already use a tax preparer to those that take up a tax practitioner at a later time.

One additional concern one may have is that firms may hire tax preparers in response to changes in tax trends: if their tax obligations are on an upward trajectory, they might, for example, on average at higher rates decide to take a tax practitioner on board to keep tax obligations at bay. To assess the relevance of the latter possibility, we estimate dynamic model specifications, which allow us to track tax outcome trends prior to treatment and also to study post-treatment dynamics:

$$\ln(Y_{it}) = \alpha + \sum_{\substack{k=-4 \\ k \neq -1}}^4 \beta^k D_{it}^k + \gamma X_{it} + \lambda_i + \varepsilon_{it} \quad (2)$$

In the base specifications, the event window spans four years prior to take-up and four years following take-up; the period before take-up is normalized to 0. D_{it}^k denotes indicators that equal 1 if the observation for firm i at time t is k periods before ($k < 0$) or after ($k > 0$) the firm starts relying on tax preparer services.

Finally, note that treatment adoption in our context is staggered. Recent literature has shown that standard regression estimates might be biased in this context in the presence of heterogeneous and dynamic treatment effects (see Roth et al. 2023). Several authors have put forward estimators to address this problem—all relying on comparing the evolution of the outcome of treated units to the outcome of never-treated or not-yet-treated units. In the analysis to come, we will present estimates relying on the estimator by De Chaisemartin and d'Haultfoeuille (2024) (where other estimators yield similar estimates, however).

5 Baseline estimation results

This section presents our estimation results. We start by quantifying the impact of tax preparer take-up on reported taxable income and tax payable, capturing the aggregate impact of tax preparer use on clients' tax liability. We then move on to assessing more specifically the take-up of tax benefits and how they emerge when firms start using tax practitioner services.

Table 3 presents baseline estimates for the estimation model in Equation (1). The table presents coefficient estimates and standard errors, which account for clustering at the firm level. The dependent variable is firms' reported taxable income normalized on assets (and winsorized at -1 and 1). Specification (1) controls for full sets of firm and year fixed effects. The estimates for tax practitioner take-up are negative and statistically significant at conventional significance levels. Specifications (2)–(6) show that this baseline finding is robust to absorbing changes in firm size (by adding the log of firms' asset to the set of control variables) and differences in income reporting trends across company types (micro businesses vs small businesses vs medium/large businesses), South African provinces, and three-digit industries.

Table 3: Baseline results: effect of tax practitioner take-up on reported taxable income

Dep. variable: taxable income/assets	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A: Full sample</i>						
Take-up	−0.0227***	−0.0376***	−0.0476***	−0.0378***	−0.0359***	−0.0402***
SE	(0.0027)	(0.0026)	(0.0026)	(0.0026)	(0.0026)	(0.0026)
SD	0.4825	0.4825	0.4825	0.4824	0.4821	0.4820
R ²	0.6838	0.6928	0.6959	0.6932	0.6962	0.6994
Observations	766,122	766,122	766,122	764,293	762,614	760,799
<i>Panel B: Exclude top 20%</i>						
Take-up	−0.0305***	−0.0466***	−0.0506***	−0.0474***	−0.0447***	−0.0508***
SE	(0.0034)	(0.0033)	(0.0033)	(0.0033)	(0.0033)	(0.0033)
SD	0.5178	0.5178	0.5178	0.5176	0.5175	0.5173
R ²	0.6870	0.6977	0.7008	0.6981	0.7011	0.7043
Observations	590,383	590,383	590,383	589,541	587,226	586,396
Asset control		x	x	x	x	x
FE:						
Firm	x	x	x	x	x	x
Year	x	x				
Company type * year			x			x
Province * year				x		x
Industry (3-digit) * year					x	x

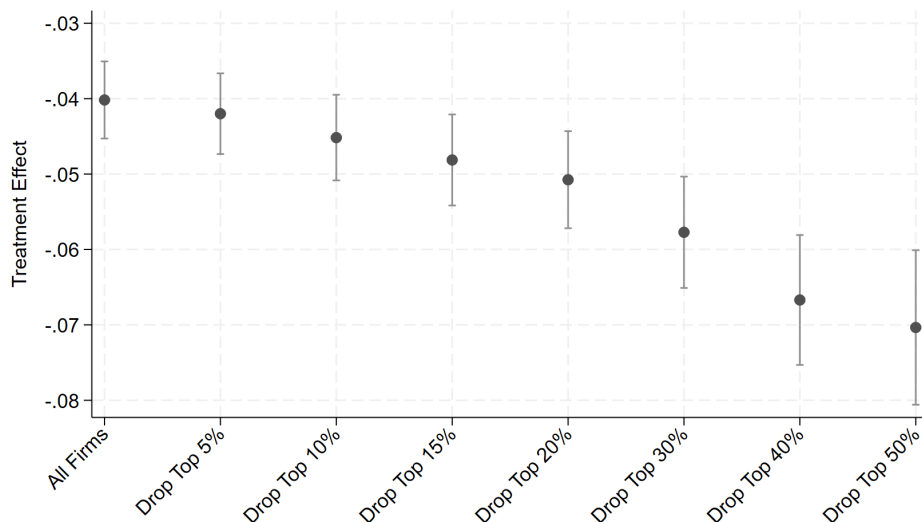
Note: the dependent variable is taxable income/assets, winsorized for values less than -1 and great than 1 . In Panel A, the data comprises all firms; in Panel B, the 20% largest firms in terms of total assets per year are disregarded. Standard errors are clustered at the firm level. ***, **, and * indicate significance at the 1, 5, and 10% level. SE indicates the standard error of the estimate; SD is the standard deviation of the dependent variable in the considered sample. The estimates include different sets of control variables: the log of firms assets ('Asset control'), firm fixed effects, year fixed effects, and interactions of year fixed effects with the type of the company, the South African province, and the three-digit industry.

Source: authors' compilation.

Note that all specifications in Table 3 present two sets of specifications: in Panel A, we account for the full set of firms; in Panel B, we disregard firms in the upper two deciles of the firm size distribution—which acknowledges that large firms may, at higher rates, rely on in-house tax services to deal with tax frictions (hence hampering the scope to identify tax frictions through variation in tax preparer take-up as intended in our analysis). Intuitively, point estimates tend to be larger in the latter set of specifications. Figure 2 presents estimates of the base model (Specification (2) of Table 3) for the full set of firms and specifications, where we use different size thresholds to drop larger businesses from the estimation data. Consistent with intu-

ition, we find that the effect size grows with the strictness with which larger firms are excluded from the data, consistent with our above considerations. Note that our preferred specification in Table 3 suggests that the taxable income reporting per assets drops by around 5 percentage points after firms start using a tax practitioner, corresponding to around 9% of a standard deviation (cf. Specification (2) of Panel B).

Figure 2: Baseline results: exclude large firms



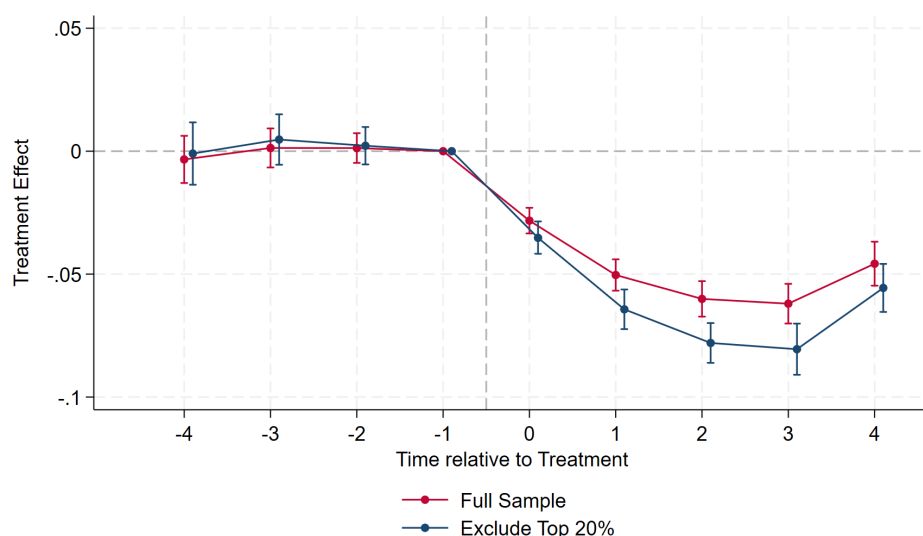
Note: the figure depicts the baseline estimates for different samples of firms, excluding the largest firms from the data (the horizontal axis depicts the fraction of top firms excluded).

Source: authors' compilation.

Figure 3 presents estimates from dynamic DiD models, which yield two insights: first, taxable income reporting over assets emerges in parallel between treated and control firms prior to treatment. After treatment (i.e. the take-up of a tax practitioner), reported taxable income drops over the first two post-treatment years before stabilizing at a lower level (consistent with adjustment frictions, such as firms adjusting operations to fully exploit certain tax benefits).

This finding prevails when we use different outcome variables: the inverse hyperbolic sine of firms' tax payments in Specifications (1) and (2) of Table 4 or tax payments over assets (winsorized at -1 and $+1$) in Specifications (3) and (4), as well as taxable income over employees and tax payable over employees in Specifications (5)–(10). The specifications account for winsorizing at different levels (1% vs. 5%) and for the full data of firms vs data where the top 20% of firms by size are disregarded. Across all specifications, the estimates turn out negative and statistically significant.

Figure 3: Dynamic DiD model for taxable income/assets



Note: the figure depicts estimates from a dynamic DiD model, including firm, company type–year, province–year, and industry–year fixed effects. Standard errors account for clustering at the firm level. For the red curve, firms in the upper two deciles of the asset size distribution are ignored in the analysis.

Source: authors' compilation.

Specification (2) of Table 5 complements these findings by re-estimating the baseline model with a restricted set of firms that newly take up a tax preparer during our sample frame. Empirical identification in this specification relies on differences in the timing of tax practitioner take-up: firms that take up a tax practitioner at a later point in time serve as the control group for identifying the impact of earlier take-ups. In a set of further robustness checks, we additionally show that our findings remain qualitatively and quantitatively unchanged when we control for balance sheet information on consulting fees, which—albeit not exclusively—include costs for tax preparer services (cf. Specifications (3) and (4) of Table 5). Complementarily, we show in Specification (1) of Table 5 that tax preparer use increases the after-tax income of firms in South Africa as measured by firms' sales minus costs of sales and tax payments (suggesting that tax cost reductions outweigh tax preparer costs).

Table 4: Alternative outcome variables

Dependent variable:	(1) IHS tax payments	(2) Drop top 20%	(3) Tax payments/assets	(4) Drop top 20%	(5)	(6) Taxable income/employees	(7)	(8)	(9) Tax payments/employees	(10) Drop top 20%
Sample:	Full	Drop top 20%	Full	Drop top 20%	Full	Drop top 20%	Full	Drop top 20%	Full	Drop top 20%
Winsorize:	1%	1%	<-1/>1	<-1/>1	1%	1%	5%	5%	1%	1%
Take-up	-0.0193	-0.0522**	-0.0014***	-0.0024***	-15,132.86***	-11,547.2***	-8,103.055***	-7,608.49***	-822.9258*	-534.0512
SE	(0.0221)	(0.0218)	(0.0005)	(0.0006)	(3,931.115)	(3,194.946)	(1,606.807)	(1,619.623)	(445.9531)	(330.7545)
SD	4.5083	3.0519	0.0959	0.0964	505,663.3	353,222.2	193,403.2	166,964.5	57,379.38	31,944.85
R ²	0.7267	0.6503	0.6284	0.6375	0.7661	0.7767	0.7587	0.7632	0.7241	0.6436
Observations	1,292,871	991,088	761,027	586,569	236,592	182,622	236,592	182,622	236,665	182,679
Asset control	x	x	x	x	x	x	x	x	x	x
FE:										
Firm	x	x	x	x	x	x	x	x	x	x
Company type * year	x	x	x	x	x	x	x	x	x	x
Province * year	x	x	x	x	x	x	x	x	x	x
Industry (3-digit) * year	x	x	x	x	x	x	x	x	x	x

Note: the dependent variables are taxable income/assets, inverse hyperbolic sine-transformed tax payments, tax payments/assets, taxable income/employees, tax payment/employees, winsorized at the 1% level, 5% level, and $-1/+1$ as given in the table. 'Take-up' indicates take-up of a tax preparer. SE is the standard error of the estimate, accounting for clustering at the firm level. Fixed effects are as indicated in Table 3. Uneven specifications are run with the full set of firms; even specifications disregard firms in the top two deciles of the firm size distribution.

Source: authors' compilation.

Table 5: Robustness analysis

Dependent variable:	(1) (Gross income – cost of sales – tax)/assets	(2)	(3)	(4)	(5)	(6)
	Taxable income/assets					
Sample	Full	Exclude never-treated	Full	Restrict treated firms to consulting fees >0	Full	Full
<i>Panel A: Full sample</i>						
Take-up	10.9360***	–0.0476***	–0.0401***	–0.0199***	–0.0413***	–0.0260***
SE	(1.8713)	(0.0028)	(0.0026)	(0.0043)	(0.0026)	(0.0029)
SD	332.8951	0.4697	0.4820	0.4788	0.4820	0.4697
R ²	0.6333	0.6837	0.6994	0.7102	0.6999	0.7372
Observations	551,273	243,824	760,799	596,747	760,799	609,940
<i>Panel B: Drop top 20%</i>						
Take-up	11.5991***	–0.0590***	–0.0506***	–0.0260***	–0.0516***	–0.0339***
SE	(1.5411)	(0.0035)	(0.0033)	(0.0074)	(0.0033)	(0.0038)
SD	301.5139	0.5104	0.5173	0.5172	0.5173	0.5045
R ²	0.6082	0.6868	0.7043	0.7151	0.7042	0.7403
Observations	716,116	180,789	586,396	444,573	586,396	457,649
Controls:						
ln(assets+1)	x	x	x	x		
ln(consulting fees+1)			x	x		
Asset deciles					x	
Asset growth						x
FE:						
Firm	x	x	x	x	x	x
Company type * year	x	x	x	x	x	x
Province * year	x	x	x	x	x	x
Industry (3-digit) * year	x	x	x	x	x	x

Note: in Specification (1) the dependent variable is firms' after-tax profit/assets, calculated as gross income less of costs of sales and tax payments; in Specifications (2)–(6) the dependent variable is firms' taxable income/assets. In Specification (2), the sample is restricted to treated firms, in Specification (4) to firms with a non-zero entry for balance sheet accounting fees. 'Take-up' indicates take-up of a tax preparer. SE is the standard error of the estimate, accounting for clustering at the firm level. SD is the standard deviation of the dependent variable in the estimation sample. Fixed effects are as indicated in Table 3. In all specifications, we disregard firms in the top two deciles of the firm size distribution.

Source: authors' compilation.

Note that it is not the aim of our study to run a cost–benefit analysis of tax preparer use from the perspective of the individual taxpayer. Rather, we are interested in identifying the impact of tax preparers on firms’ tax reporting, which offers insights on tax frictions and to what extent they are overcome by tax intermediation. Back-of-the-envelope calculations, consistent with Specification (1) of Table 5, however, suggest that the net impact of preparers on firms’ after-tax profits is positive and quantitatively significant: corporate tax compliance costs surveys for South Africa—and also more broadly for other countries—are scarce. Existing surveys and pricing tables suggest that the costs of filling in a corporate tax return in South Africa is rather low for small and medium-sized firms, around ZAR1,000. Costs more broadly related to taxation services are higher. Surveys point to average costs of around ZAR25,000, but these also include other forms of tax obligations, such as payroll or VAT compliance. For this reason, they serve as a very high upper bound at best in the context of our analysis, which focuses on CIT only.¹³ More narrowly, the Doing Business Survey of the World Bank indicates that it took South African businesses around 61 hours per year during our data frame to comply with profit taxes (see Business Tech (2017) and the Doing Business Survey of the World Bank). Evidence suggests that the largest fraction of these costs relate to data collection and documentation of expenses (see e.g. European Commission 2018; Slemrod and Bakija 2008), which largely falls in the realm of the taxpayer. Assuming that firms outsource around half of their tax efforts to tax preparers puts the costs for tax preparer services at around ZAR15,000 per annum, compared to an average tax reduction by tax preparer services as estimated by our analysis of around ZAR39,000.¹⁴

We ran a number of additional robustness checks. Specifications (5) and (6) of Table 5 show that our findings prevail when we more granularly control for changes in firm size on businesses’ tax outcomes: Specification (5) controls for asset deciles (and thus allows for a non-linear impact of firm size on tax reporting) and Specification (6) accounts for lagged asset growth (which might impact the claiming of tax deductions). In both specifications, the impact of tax preparer take-up is negative and of broadly comparable size to our baseline estimates. Figure 4 shows that our findings are robust to granularly controlling for industry trends (by including industry–year fixed effects up to the five-digit level) for absorbing potential spatial differences in tax reporting trends up to the local municipality or even ward level.

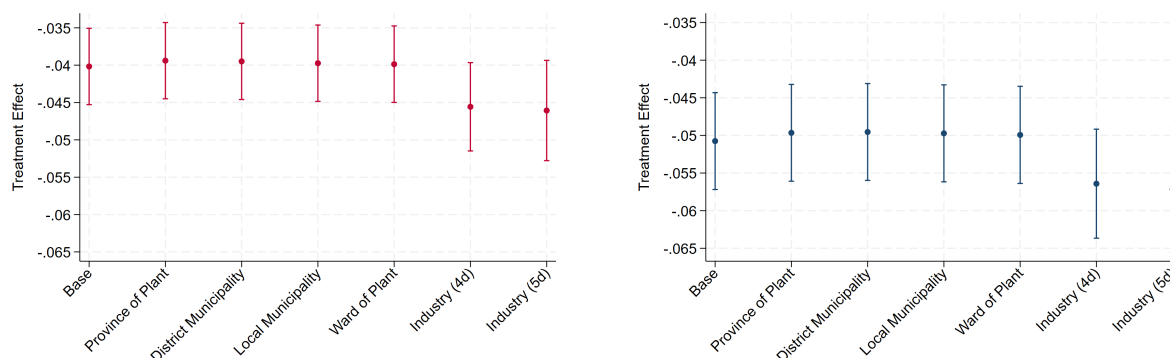
¹³ Most surveys for tax compliance costs for other countries also capture overall compliance cost burdens only—see, for example, Guyton et al. (2003) and Contos et al. (2013) for the US and European Commission (2018, 2022) for Europe.

¹⁴ Web searches for tax preparer services suggest hourly wages of around ZAR500 during our sample frame; applied to 30 hours, this translates into costs of ZAR15,000. Specification (9) of Table 4 suggests that tax preparers, on average, save their clients tax costs of around ZAR39,000 ($= 823 \cdot 47.5$), where 47.5 is the number of employees by treated firms—cf. Table 2.

Figure 4: Finer grid fixed effects: effect of tax practitioner take-up on reported taxable income

(a) Full sample

(b) Drop top 20%



Note: the figure depicts static DiD estimates, including firm, company type–year, province–year, and industry–year fixed effects for the ‘base’ specification. For the next four specifications, we replace the province–year fixed effect to province of plant–year, district municipality–year, local municipality–year, and ward of plant–year fixed effects, respectively, leaving all other fixed effects unchanged. For industry (four-digit) and industry (five-digit) we change the industry–year fixed effects to the respective level, keeping everything else unchanged. Standard errors account for clustering at the firm level. In part (a) we account for the full data of firms; in part (b) we disregard firms in the upper two deciles of the asset size distribution.

Source: authors’ compilation.

Table 6 presents the results from matching strategies. The first column applies coarsened exact matching and exactly matches firms across firm size–industry–region–firm age cells, where firm size is measured by deciles of the asset distribution, industry is measured by two-digit industries, region is measured by firms’ host provinces, and firm age is measured by the year in which firms are first observed in the data. Specification (2) presents analogous results for propensity score nearest-neighbour matching. Both specifications confirm our baseline findings. Specifications (3) and (4) show that similar results emerge when we account for a more granular industry affiliation (five-digit) and a more granular regional affiliation (district municipality). Figure 5 shows that our findings prevail when we employ estimators that are robust to heterogeneous and dynamic treatment effects in settings with a staggered treatment design (the figure presents estimates from specifications that rely on De Chaisemartin and d’Haultfoeuille (2024); relying on other estimators that are robust to heterogeneous and dynamic treatment effects yields similar findings).

As sketched in the data section, the number of tax preparers and tax preparer use saw a declining trend across our data frame. This pattern might relate to changes in tax filing, changes in tax preparer quality, advancing digitization, and web-based tax-related information provision (which may lower tax frictions). This could change the impact of tax preparers across time. This possibility is assessed in Figure B4 in the Appendix, which presents our baseline estimates when restricting the sample frame by taking out later tax years. A negative and significant effect prevails across all specifications, with the effect size becoming smaller when the data frame is restricted to the earliest sample years. This might relate to improvements in tax

preparer quality; alternatively, the findings are consistent with the (smaller) set of firms that take up a tax practitioner in later years being entities that on average benefit more from tax preparer services. See Appendix B for a number of robustness analyses.

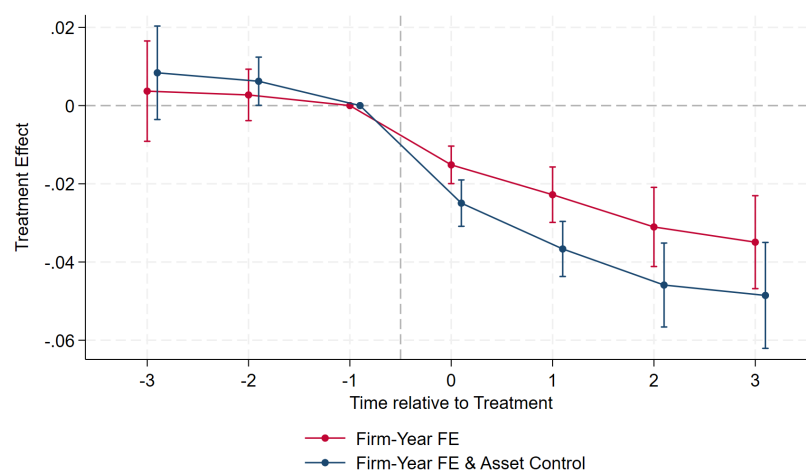
Table 6: Matching: tax practitioner effect on reported taxable income

Dependent variable: taxable income/assets				
	(1)	(2)	(3)	(4)
	CEM	PSM	CEM	PSM
<i>Panel A: Full sample</i>				
Take-up	−0.0452***	−0.0502***	−0.0407***	−0.0529***
SE	(0.0053)	(0.0045)	(0.0057)	(0.0053)
SD	0.5115	0.4976	0.5093	0.5145
R ²	0.6478	0.6405	0.6550	0.6372
Observations	197,379	121,271	171,756	93,898
<i>Panel B: Drop top 20%</i>				
Take-up	−0.0504***	−0.0586***	−0.0452***	−0.0582***
SE	(0.0062)	(0.0053)	(0.0066)	(0.0061)
SD	0.5406	0.5303	0.5402	0.5443
R ²	0.6554	0.6435	0.6631	0.6455
Observations	166,799	97,627	145,650	77,448
Matching variables:				
First year	x	x	x	x
Deciles of assets	x	x	x	x
Industry (two-digit)	x	x		
Industry (five-digit)			x	x
Province	x	x		
District municipality			x	x

Note: the table presents estimates with coarsened exact matching (CEM) using the indicated matching variables and propensity score nearest- neighbour matching (PSM). The dependent variable is the taxable income/assets. SE depicts the standard error, accounting for clustering at the firm level; SD is the standard deviation of the dependent variable in the sample. All specifications include firm and year fixed effects and control for $\ln(\text{Assets} + 1)$.

Source: authors' compilation.

Figure 5: De Chaisemartin and d'Haultfoeuille (2024) baseline: taxable income/assets



Note: the figure depicts dynamic DiD estimates relying on the estimator of De Chaisemartin and d'Haultfoeuille (2024). The dependent variable is taxable income/assets. We present estimates using only firm and year fixed effects and adding the asset control variable.

Source: authors' compilation.

6 Take-up of specific tax benefits

In this section, we zoom in and test whether the take-up of a tax preparer increases firms' propensity to make use of specific tax benefits in South African tax law—consistent with tax information and filing frictions, which are addressed by tax preparer services. We account for three types of benefits: the use of the SBC tax scheme with lower marginal taxes than the headline rate (Section 6.1), the claiming of the ETI, designed to foster employment of the young (Section 6.2), and the use of loss carry-forward provisions (Section 6.3).

6.1 SBC tax scheme

In South Africa, small firms can qualify as an SBC and benefit from special tax incentives, as well as access to special tax rates below the headline rate of 28% during our sample frame (in tax year 2020, SBC income below ZAR79,000 was exempt from taxation, taxable income of ZAR79,001–365,000 was taxed at 7%, taxable income of ZAR365,001–550,000 was taxed at 21%, and income above ZAR550,001 was taxed at the headline corporate tax rate of 28%) (South African Revenue Service 2024b). To qualify, firms must have a maximum gross income of less than ZAR20 million from tax year 2014 onward (ZAR14 million before this time). A number of further criteria need to be fulfilled: firms must be private companies and all shareholders must be natural persons; the firm must not engage in certain types of activities such as financial trading or passive investment vehicles and personal services. Firms must declare SBC status to SARS and provide documentation proving they fulfil the eligibility criteria.

Figure 6 presents evidence on SBC take-up. The eligibility for SBC is evaluated according to firms' turnover.¹⁵ In robustness checks, we also exclude broad industry categories (one-digit level) from the estimation data, which may comprise financial and personal service firms. Relative to our SBC-eligibility definition by firm turnover, the fraction of firms that make use of SBC taxation is rather small, ranging between 30% and 45% across our data years, with an increasing take-up over time (Figure 6(a)).¹⁶ Figure 6(b) presents the fraction of SBC use among eligible firms by firm size class (measured by firm assets), suggesting a hump-shaped pattern. Take-up increases with firm size for smaller entities, consistent with information and filing frictions negatively correlating with firm size. The fraction of eligible firms among larger entities is again naturally lower; the fact that larger entities (as measured by assets) are eligible for SBC

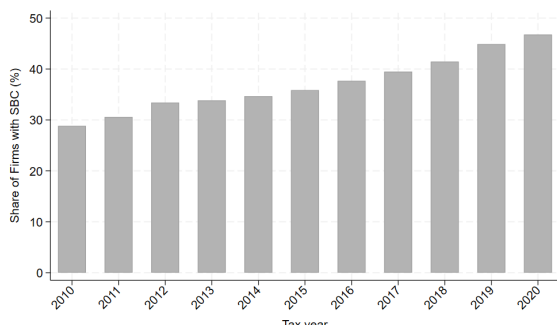
¹⁵ We do not observe information on shareholding structures and particularities of the business scheme, implying that the set of eligible firms is an upper bound to the true set of eligible firms. However, we also present estimates for further excluding MNEs—see Table C3.

¹⁶ We find a fall in the share of firms claiming SBC status in 2019 and 2020, when we assume missing data information means no SBC claim. We cannot explain this pattern. However, we rerun our baseline analyses and exclude tax years 2019 and 2020, and the results are similar to the findings from the full sample.

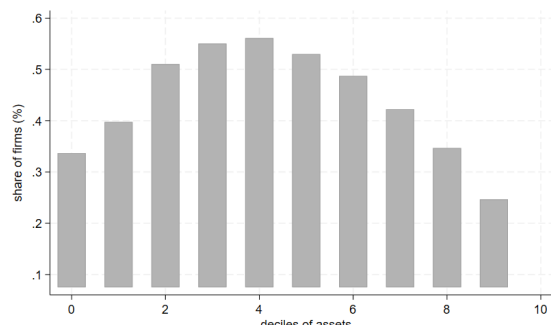
may relate to sales rates and dips in particular years, which may not induce firms to opt into the SBC scheme.¹⁷

Figure 6: SBC: descriptives

(a) Share of firms with SBC



(b) Share of firms with SBC by deciles of assets



Note: the figure depicts the share of SBC-eligible firms (as defined by the turnover criterion) by tax years (a) and by firm size (b). ‘Decile 0’ comprises firms with zero assets.

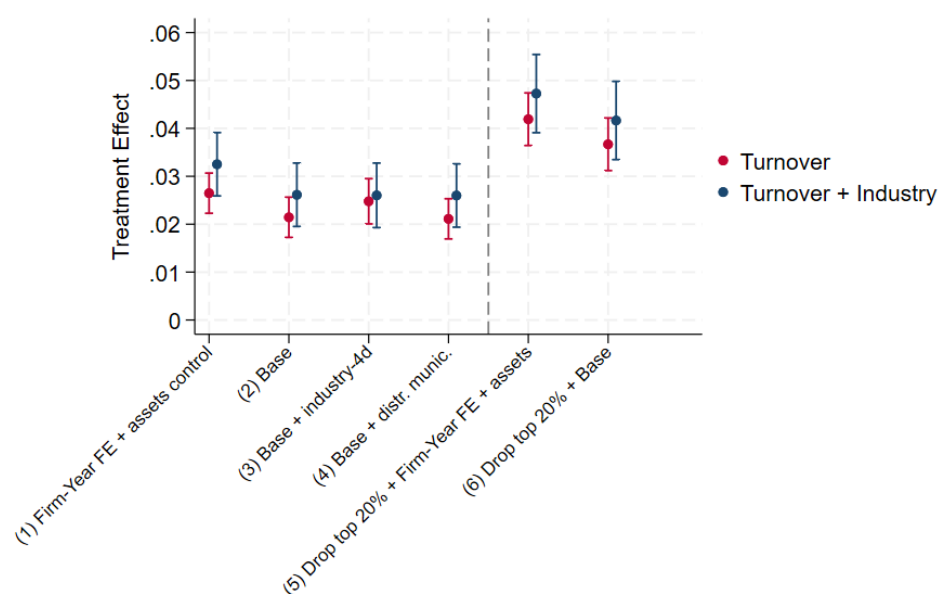
Source: authors’ compilation.

In Figure 7 we present estimates from models where we assess whether tax practitioner take-up increases firms’ propensity to use the SBC scheme. The data is restricted to SBC-eligible firms, as defined above; the dependent variable is a dummy indicating taxation under the SBC scheme. Otherwise the empirical specification follows the previous model specification. All specifications include full sets of firm fixed effects. Further control variables are included as indicated in the figure. Coefficient estimates are also depicted in Tables C1, C2, and C3 in the Appendix. Quantitatively, the findings suggest that tax preparer use increases firms’ propensity to claim the SBC tax incentive by around 4.2 percentage points, or around 8.8% evaluated at the average take-up rate in the data (cf. Specification (2) of Panel B in Table C1). Figure 8 shows that effect size increases if the sample is restricted to smaller entities, which is consistent with the notion that they are more exposed to tax frictions and less well equipped to deal with them without professional tax adviser support. Re-estimating the model disregarding firms in financial and personal service industries yields larger estimates (4.7% relative to 4.2% in the base model in Specification (2)).

We again show that our findings are robust to using matching strategies (CEM and propensity score nearest-neighbour matching)—cf. Table 7. We estimate a dynamic DiD model relying on the estimator by De Chaisemartin and d’Haultfoeuille (2024) in Figure 9. The figure corroborates the common trend assumption: prior to the take-up of a tax preparer, the propensity of treated firms (which start using a tax preparer) and control firms (which do not rely on tax preparer services) emerge in parallel; after tax practitioner take-up, SBC take-up rates of treated firms increase over the first two post-treatment years (remaining relatively constant thereafter).

¹⁷ Firm size is measured by assets, which explains why there are some eligible firms even in large asset classes (businesses with high assets but low sales).

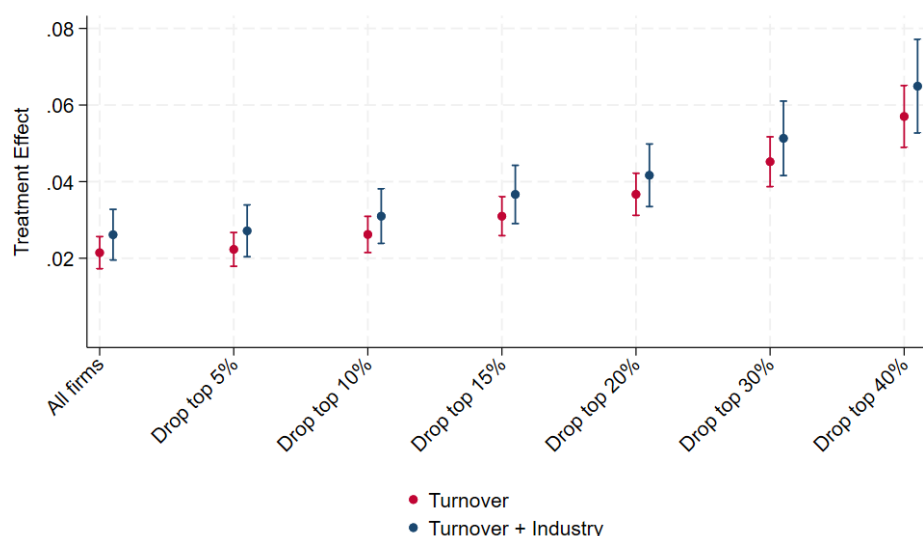
Figure 7: Effect of tax practitioner take-up on SBC claim: different fixed effects



Note: the figure depicts the baseline estimates according to Tables C1 and Table C2. 'Turnover' refers to the sample of firms eligible by their gross income, while 'Turnover + Industry' defines eligible firms by their gross income and industry. Specifications (1)–(4) present estimates based on the full sample, while Specifications (5) and (6) present analogous estimates for excluding the top 20% of firms by assets. Our 'base' includes the assets control and the following fixed effects: firm, company type, industry code (three-digit), and company's province.

Source: authors' compilation.

Figure 8: Effect of tax practitioner take-up on SBC claim: drop large firms



Note: the figure depicts the baseline estimates in our specifications, where larger firms are dropped from the sample based on different levels of strictness. 'Turnover' refers to the sample of firms eligible by their gross income, while 'Turnover + Industry' defines eligible firms by their gross income and industry.

Source: authors' compilation.

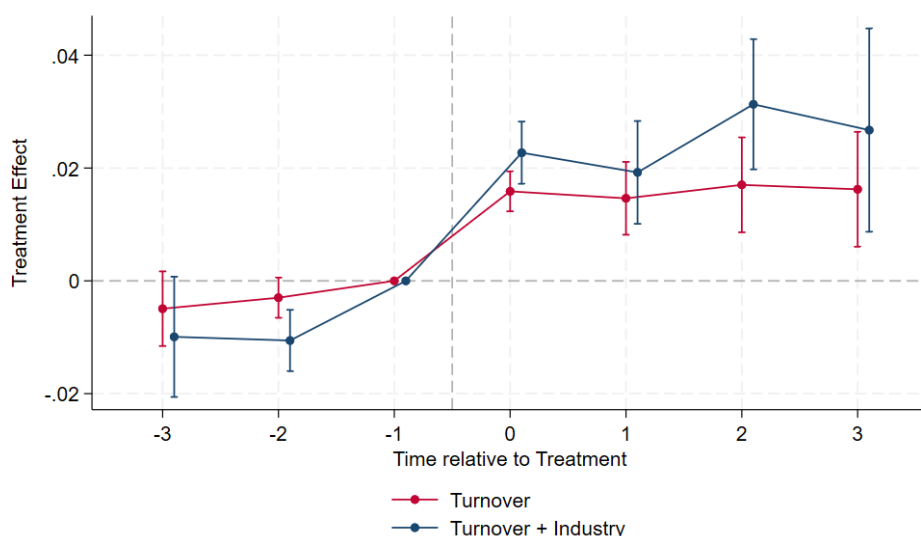
Table 7: Results after matching: effect of tax practitioner take-up on SBC claim

	Turnover		Turnover + industry	
	CEM	PSM	CEM	PSM
Take-up	0.0246***	0.0188***	0.0324***	0.0268***
SE	(0.0031)	(0.0028)	(0.0050)	(0.0044)
SD	0.4884	0.4865	0.4953	0.4982
R ²	0.8152	0.7813	0.8238	0.7872
Observations	713,679	265,387	342,389	116,070
<i>Matching variables:</i>				
First year	x	x	x	x
Deciles of assets	x	x	x	x
Industry (2-digit)	x	x	x	x
Province	x	x	x	x
Company type	x	x	x	x
<i>Controls & fixed effects:</i>				
Log(assets) control	x	x	x	x
Firm	x	x	x	x
Year	x	x	x	x

Note: the table presents estimates from our specifications, where we re-estimate our baseline model but rely on coarsened exact matching and propensity score nearest-neighbour matching to limit the observed differences across treated and control firms. We rely on the matching variables as indicated in the table. SE indicates the standard error, SD the standard deviation of the dependent variable in the sample. ***, **, and * indicate significance at the 1, 5, and 10% level.

Source: authors' compilation.

Figure 9: De Chaisemartin and d'Haultfoeuille (2024) SBC take-up



Note: the figure presents estimates relying on the estimator by De Chaisemartin and d'Haultfoeuille (2024). 'Turnover' refers to the sample of firms eligible by their gross income, while 'Turnover + Industry' defines eligible firms by their gross income and industry. We include firm and year fixed effects and control for the natural logarithm of assets.

Source: authors' compilation.

6.2 Employment tax incentive

A second prominent tax benefit in South Africa is the ETI, which was introduced in 2014 with the aim of reducing the country's persistently high youth unemployment rate. The tax incentive works as a wage subsidy and targets young workers aged 18–29 years who earn less than a specified threshold (initially ZAR6,000 per month). By providing a tax credit to employers, the ETI seeks to reduce financial costs associated with employing young, low-wage workers in order to stimulate job creation in the formal sector. The policy was initially designed as a short-term intervention, but has been extended multiple times since its introduction.

Our data lends itself well to the study of firms' use of the ETI scheme. Specifically, we link our corporate tax return information to pay-as-you-earn (PAYE) data, which provides information on the universe of workers employed by a given firm, including data on the wages earned and the dates of birth of workers. See Table D1 in the Appendix for a detailed overview on data cleaning.¹⁸ Table 8 depicts the fraction of firms in South Africa that employ low-wage workers

¹⁸ In our sample, we (1) exclude the top 20% of firms in terms of assets—as in our baseline analysis—and (2) restrict on eligible firms, which means firms that have at least one employee eligible for the ETI. This drastically reduces our sample, as eligibility for the ETI is highly concentrated in larger firms with more assets.

aged 18–29 and which are thus eligible for ETI claims (less than 10% of firms). The table indicates that only around one-third of all eligible firms claim the ETI.¹⁹

Table 8: The ETI: keep also CIT if not matched to IRP5

Tax year	Share of eligible firms (%)	Share of eligible firms claiming ETI (%)
2014	4.75	25.98
2015	10.50	28.87
2016	9.21	27.90
2017	8.22	28.96
2018	7.54	31.61
2019	7.00	29.16
2020	6.60	31.07
Total	7.64	29.32

Note: the table depicts the fraction of firms among all firms that are eligible for the ETI in the sense that they employ at least one eligible worker. The table reports the fraction of eligible firms that actually claim the ETI.

Source: authors' compilation.

We restrict our analysis to firm-years in which entities are eligible for the ETI, and again rely on our DiD strategy to assess whether the propensity of firms to claim the ETI diverges when firms start using a tax preparer, relative to businesses that do not rely on tax preparer services.²⁰

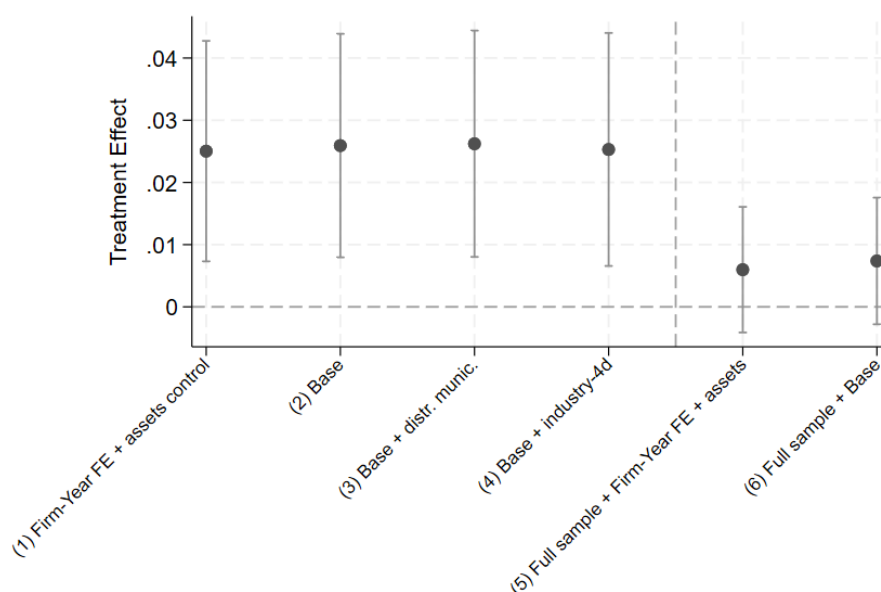
The results are presented in Figure 10. Static estimates corresponding to the figure can be found in Table D2. The organization of the figure and table again follows the previous section and assesses the robustness of the findings to absorbing industry, region, and firm-size specific time trends in the claiming of the ETI, as proxied by up to four-digit industries, local municipalities, and asset ventiles. The estimates suggest that tax preparer take-up increases the propensity to claim the ETI by around 2.6 percentage points. This finding again turns out to be robust against using matching strategies—cf. Table 9.

We also estimated dynamic model versions. Figure D1 presents dynamic estimates on the full sample, while Figure 11 presents estimates drawing on the estimator of De Chaisemartin and d'Haultfoeuille (2024). Both figures corroborate the common trend assumption. Claiming the ETI emerges in parallel across treated and control groups prior to treatment, and diverges thereafter. Consistent with tax frictions, the use of a tax preparer raises the propensity for claiming the ETI.

¹⁹ This fraction is somewhat lower than the share of eligible *workers* for which the ETI is claimed as reported in Ebrahim and Pirttilä (2025) (reflecting that larger firms are, on average, more likely to be eligible for the ETI).

²⁰ We again drop the top 20% of firms by their assets. However, findings are robust also when including top firms by assets—see Figure D1.

Figure 10: Effect of tax practitioner take-up on ETI claims: different fixed effects



Note: the figure depicts the baseline estimates according to Table D2. Specifications (1)–(4) present estimates for excluding the top 20% of firms by assets, while Specifications (5) and (6) present estimates for the full sample. Our 'base' includes the assets control and the following fixed effects: firm, company type, industry code (three-digit), and company's province.

Source: authors' compilation.

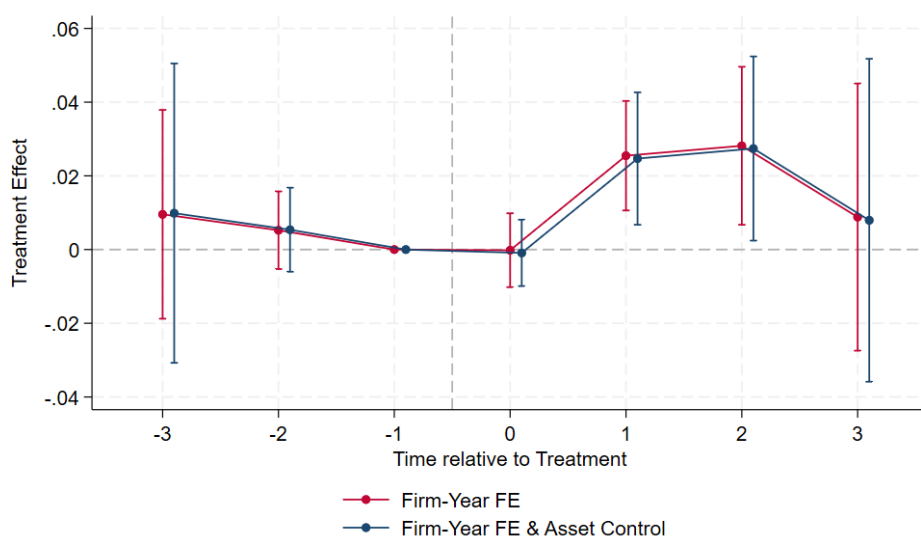
Table 9: Results after matching: effect of tax practitioner take-up on ETI claims

	(1) CEM	(2) PSM
Take-up	0.0326*	0.0321**
SE	(0.0179)	(0.0139)
SD	0.4351	0.4262
R ²	0.7096	0.6918
Observations	6,757	8,077
<i>Matching variables</i>		
First year	x	x
Deciles of assets	x	x
Industry (2-digit)	x	x
Province	x	x
Company type	x	x
<i>Fixed effects</i>		
Firm	x	x
Year	x	x

Note: the table presents specifications where we re-estimate the baseline model, identifying control firms based on a matching strategy (coarsened exact matching in Specification (1) and propensity score nearest-neighbour matching in Specification (2)). We exclude the top 20% of firms by assets.

Source: authors' compilation.

Figure 11: De Chaisemartin and d'Haultfoeuille (2024) ETI take-up



Note: the figure depicts estimates relying on the estimator by De Chaisemartin and d'Haultfoeuille (2024).

Source: authors' compilation.

6.3 Loss-offset provisions

Prior research for the US documents that tax system complexity may also hamper the application of loss-offset provisions (see Zwick 2021). Similar to other countries, taxpayers in South Africa are allowed to carry forward losses indefinitely and offset them with future profits. Carry backwards of losses is not allowed. If taxpayers lack awareness of the carry-forward option, they may fail to minimize their reported taxable income in loss-making regions as current-period tax obligations are unaffected (in particular if tax minimization involves costs, such as documentation and reporting of specific tax deductions).

We assess the role of losses in our setting along multiple lines: Specifications (1) and (2) of Table 10 re-estimate our baseline model in the full data (cf. Specification (1)) and restricted to firm-years where taxable income is positive (cf. Specification (2)). While the findings turn out negative and statistically significant in both models, the estimates are quantitatively significantly smaller in these models relative to our base specification (cf. column (6) of Table 3), suggesting that loss reporting contributes to our findings. This is corroborated in Specifications (3) and (4), which show that the propensity for loss reporting increases significantly with the take-up of a tax practitioner, by around 6.2 percentage points (evaluated at the sample mean, this corresponds to a relative increase by 23%—cf. Specification (4)). Specifications (5)–(8) suggest that (close-to-)zero taxable income reporting becomes less likely after the take-up of a tax practitioner.

Table 10: Reporting of losses

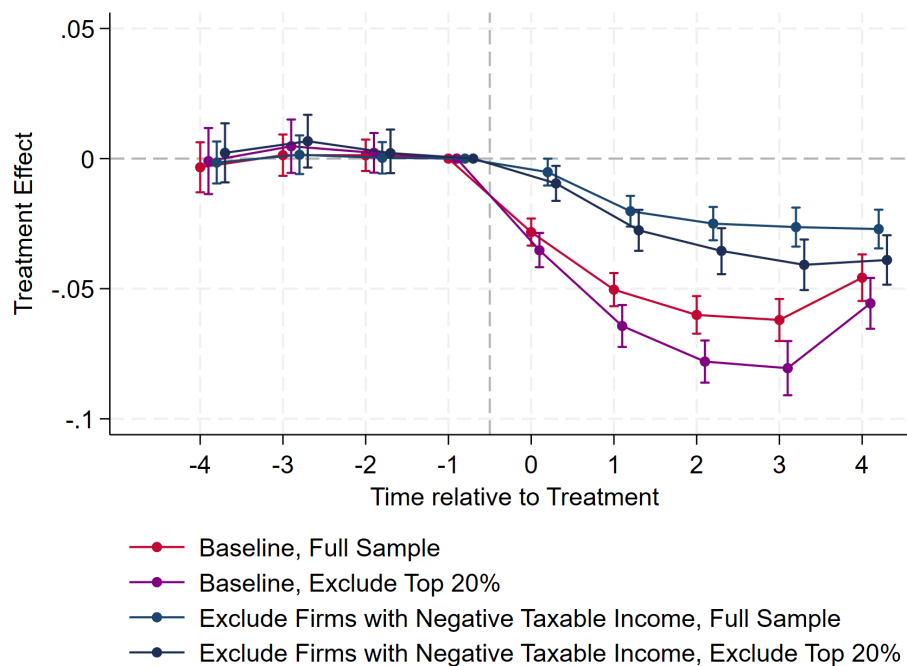
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:	Taxable income/assets		Loss dummy		Dummy for taxable income/assets = 0		Dummy for taxable income/assets ∈ (−0.001, 0.001)	Dummy for taxable income/assets ∈ (−0.01, 0.01)
Sample:	Firms with taxable income > 0		Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
Sample restriction:	-	Drop top 20%	-	Drop top 20%	-	Drop top 20%	-	-
Take-up	−0.0120***	−0.0180***	0.0449***	0.0632***	−0.0038***	−0.0051***	−0.0058***	−0.0088***
SE	(0.0023)	(0.0030)	(0.0023)	(0.0028)	(0.0011)	(0.0016)	(0.0013)	(0.0019)
SD	0.2882	0.3015	0.4634	0.4424	0.2772	0.3059	0.3039	0.3716
R ²	0.7435	0.7360	0.7285	0.7582	0.8365	0.8709	0.7778	0.6764
Observations	314,934	228,682	1,292,540	966,380	760,799	437,147	760,799	760,799
Asset control	x	x	x	x	x	x	x	x
FE:								
Firm	x	x	x	x	x	x	x	x
Company type * year	x	x	x	x	x	x	x	x
Province * year	x	x	x	x	x	x	x	x
Industry (3-digit) * year	x	x	x	x	x	x	x	x

Note: taxable income/assets is winsorized for values less than −1 and greater than 1. The loss dummy equals 1 for firms with negative taxable income and 0 for firms with positive or zero taxable income. We drop the biggest 20% of firms in terms of total assets within each year.

Source: authors' compilation based on National Treasury and UNU-WIDER (2025).

Figures 12 and 13 present estimates from dynamic DiD models, corresponding to Specifications (1)–(3) in Table 10. In Figure 12, we present estimates from the main model specifications as well as from specifications where the data is restricted to firm-years where businesses earn positive income. Prior to treatment, taxable income reporting emerges in parallel across treatment and control groups, while it drops after the take-up of a tax practitioner, but the effect is quantitatively less pronounced in the restricted set of firms, consistent with our prior interpretation that increased loss reporting contributes to our findings.

Figure 12: Reporting of losses

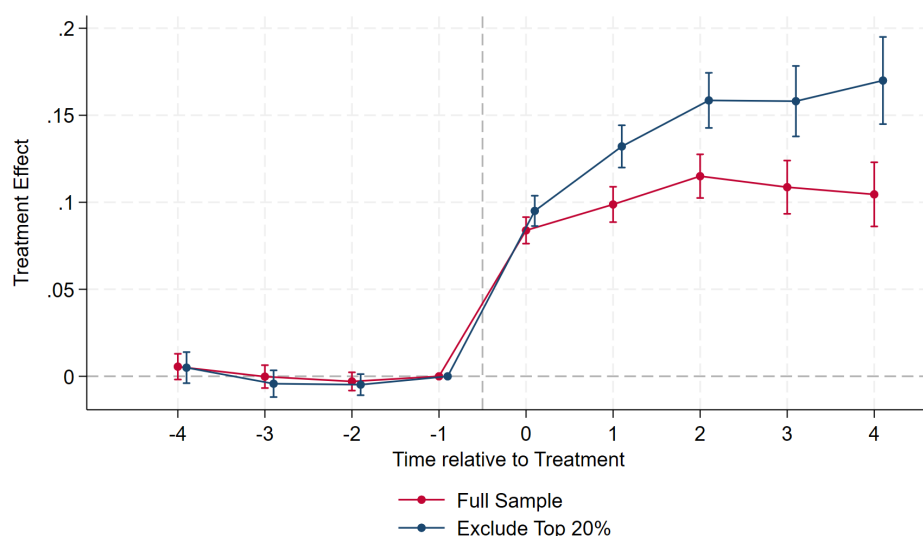


Note: the figure presents a dynamic DiD model for the base analysis (the same as in Figure 3) and in a restricted sample of firm-year observations, where the taxable income/assets is strictly positive.

Source: authors' compilation.

In Figure 13 we test for the take-up of losses by restricting the treatment group to those firms that did not feature any losses prior to the take-up of a tax practitioner. These treated entities are—based on nearest-neighbour matching—matched to a control group of firms without tax practitioners (during the full sample frame), which equally did not feature any loss in the years prior to treatment of the matched treated firm (while, after treatment, both the treated and the control firms are allowed to feature losses). The estimates show that the propensity of treated firms to report losses increases significantly in the years after treatment relative to control entities, consistent with the notion that filing losses becomes more prevalent after the take-up of a tax practitioner. Figure 14 shows that these estimates are robust to relying on the estimator by De Chaisemartin and d'Haultfoeuille (2024).

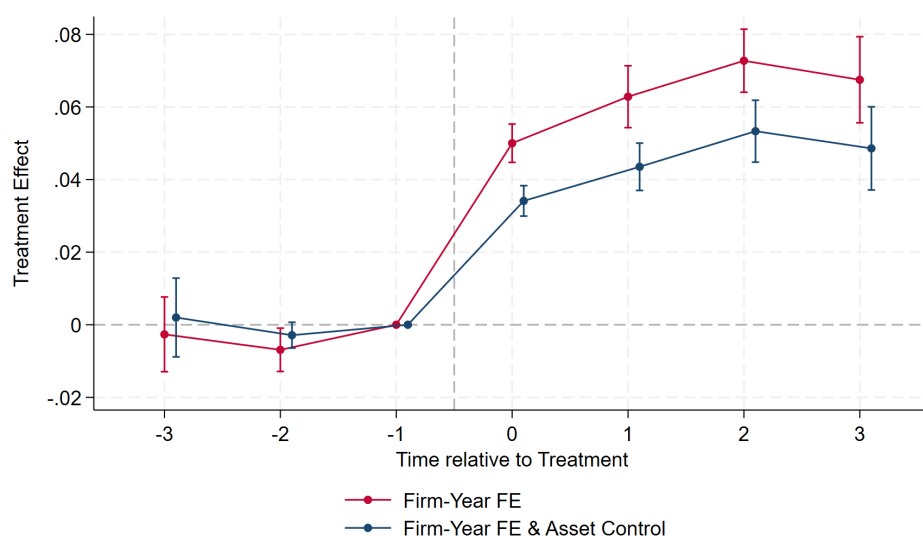
Figure 13: Matching based on cohorts without losses—dependent variable: loss dummy



Note: the figure depicts dynamic DiD estimates from models where we restrict the treated group to firms without losses prior to tax preparer take-up. These treated firms are—by nearest-neighbour matching—matched to control entities without tax preparer use throughout the sample frame, which equally feature no losses before the year of the take-up of the tax practitioner by treated firms, but are allowed to run losses thereafter. We rely on first year, deciles of assets, two-digit industry code, province, and company type for matching variables, control for firms' assets, and include firm and year fixed effects analogous to previous matching strategies.

Source: authors' compilation.

Figure 14: De Chaisemartin and d'Haultfoeuille (2024) loss dummy



Note: the figure depicts dynamic DiD estimates relying on the estimator of De Chaisemartin and d'Haultfoeuille (2024). The dependent variable is a dummy that is equal to 1 for firm-year observations where taxable income is negative. We present estimates using only firm and year fixed effects and for adding the asset control variable.

Source: authors' compilation.

7 Implications

The analysis so far has showed that tax preparers shape the tax payments and the take-up of tax benefits by their clients. This may have important economic and fiscal repercussions. First,

it implies that the actual corporate tax burden and its distribution may diverge from the one that is intended and implied by tax legislation. This has distributional implications as owners of firms are not taxed homogeneously if they are—to a different extent—exposed to tax frictions or have less incentive or ability to address tax frictions by drawing on the services of tax advisers. It may also have implications for product market outcomes: differences in effective tax costs may put firms that do not draw on tax advisory services at a competitive disadvantage.²¹

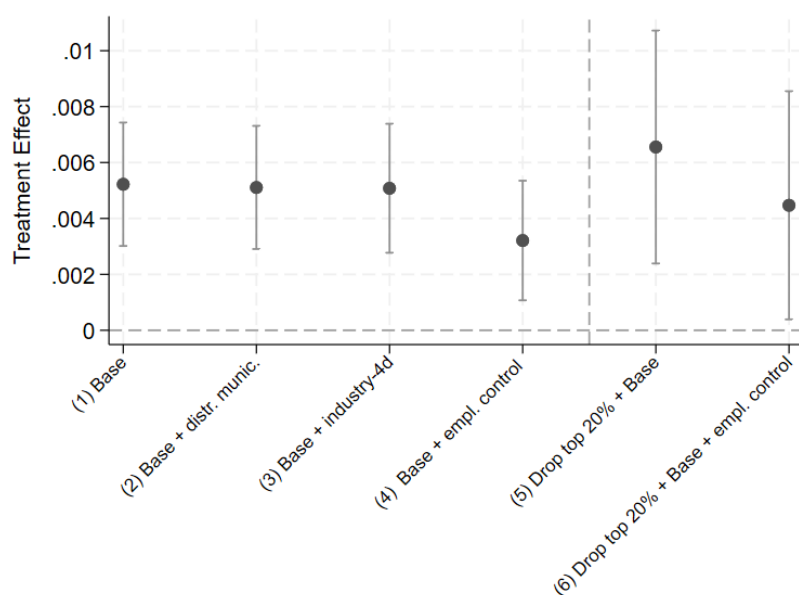
Importantly, it also means that the intended policy effects of tax incentives (e.g. to offer lower tax rates to smaller firms in order to incentivize entrepreneurship and the transition from the shadow economy to the formal sector or to foster youth employment through the ETI) may be diminished by information and compliance frictions. The intermediary role of tax preparers promises to alleviate these frictions.

We empirically test for this possibility in the context of the South African ETI. Specifically, we assess whether tax preparers not only increase the propensity that eligible firms claim the ETI, but also enhance the employment of young, eligible workers. We therefore rerun our base-line estimation model to assess whether the take-up of a tax preparer is associated with an increase in the employment of young workers. The dependent variable is a dummy indicating whether the firm employs at least one young worker eligible for the ETI scheme. The estimates are presented in Figure 15 and Table E1; they suggest that tax preparer take-up increases the propensity to employ young workers eligible for the ETI.²² The effect is robust against controlling for changes in firm size as measured by log assets and log employment (ensuring that what we measure is an effect on the employment structure of firms, not a general shift in the size of employment). It is again robust to granularly absorbing industry, region, and firm-size trends in employment structure (i.e. employment of young workers). Quantitatively, we find that the use of a tax preparer increases the propensity to employ young workers by around 0.3–0.7 percentage points, depending on the specification. Our findings hence support the notion that tax frictions are reduced by tax preparer use. Consistent with prior evidence (see Ebrahim and Pirttilä 2025, who suggest only moderate employment increases in response to the South African ETI), effect size is also moderate in our context. Again, the findings turn out to be robust against turning to matching strategies to balance treated and control firms in observed characteristics (cf. Table 11) and to estimating dynamic DiD models relying on the estimator by De Chaisemartin and d'Haultfoeuille (2024) (cf. Figure 16).

²¹ If there is a shortage of tax preparers in particular regions, some firms may lack access to tax preparer services (see also our discussion in the data section). Some firm owners may also underestimate the benefits they can obtain from relying on tax preparer services; smaller firms may refrain from take-up in the presence of fixed costs of tax preparer use.

²² We do not control for the natural logarithm of firms' assets in this case. However, static results are robust to including log assets as a control variable.

Figure 15: Effect of tax practitioner take-up on employment structure: different fixed effects



Note: the figure depicts the baseline estimates according to Table E1. Specifications (1)–(4) present estimates based on the full sample, while Specifications (5) and (6) present analogous estimates for excluding the top 20% of firms by assets. Our ‘base’ includes the assets control and the following fixed effects: firm, company type, industry code (three-digit), and company’s province.

Source: authors’ compilation.

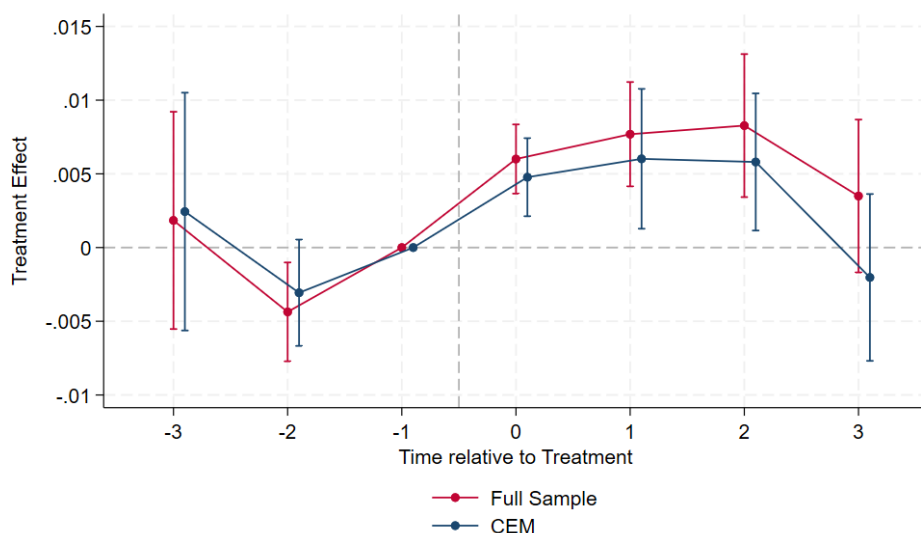
Table 11: Matching: effect of tax practitioner take-up on employment structure

	(1) CEM	(2) PSM
Take-up	0.0045***	0.0055**
SE	(0.0012)	(0.0012)
SD	0.1719	0.1674
R ²	0.6207	0.6314
Observations	273,472	172,100
Matching variables		
First year	x	x
Deciles of assets	x	x
Industry (2-digit)	x	x
Province	x	x
Company type	x	x
Fixed effects:		
Firm	x	x
Year	x	x

Note: the table presents estimates from robustness checks, which re-estimate the baseline model applying matching strategies: coarsened exact matching in Specification (1) and nearest-neighbour propensity score matching in Specification (2). Matching characteristics are as given in the table: first years, deciles of the asset distribution, two-digit industries, province, and company type. Estimates based on full sample.

Source: authors’ compilation.

Figure 16: De Chaisemartin and d'Haultfoeuille (2024): effect of tax practitioner take-up on employment structure



Note: the figure presents estimates from De Chaisemartin and d'Haultfoeuille (2024). Coarsened exact matching characteristics: first year, mean assets deciles, industry code (five-digit), district municipality, and company type in first year.

Source: authors' compilation.

8 Conclusion

In this paper, we study corporate tax system complexity and the role of tax intermediation—tax preparer and tax advisory services—in alleviating frictions from tax complexity. Our testing ground is South Africa. The analysis relies on rich tax administrative data comprising the universe of corporate tax returns in the country, linked to information on firms' tax preparer use. The evidence suggests that the take-up of a tax preparer significantly and persistently lowers the tax reporting of firms. In additional analyses, we show that the take-up of a tax practitioner raises taxpayers' propensity to make use of specific benefits in tax law (e.g. to claim the ETI for young workers and the use of loss-offset provisions).

We discuss implications of our findings. On the one hand, our evidence is consistent with frictions in corporate taxation, which hamper the application of tax law and can drive a wedge between legally intended and actual effective tax burdens (and their distribution across taxpayers). Tax practitioners are shown to alleviate these frictions (e.g. to increase the use of the ETI), but as many firms refrain from using tax preparer services, these frictions are not reduced homogeneously across businesses, which may create its own inefficiencies and inequities.

Tax intermediation therefore is a double-edged sword. The findings emphasize that tax system simplicity is of high value and governments are well advised to avoid overly complex tax regulations. Our findings can also be understood as a call to turn to alternative instruments (other

than tax intermediation), which may allow reducing tax frictions also for those taxpayers who may not be able or willing to rely on tax advisory services. These alternatives include taxpayer information programmes and new options related to digitization and artificial intelligence—for example, chatbots that can provide information on tax regulations or pre-filling of tax returns (tax authorities could, for example, automatically account for the ETI for eligible workers as eligibility is observable from wage and date of birth information, which is available from tax reports).

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Appendix A: Descriptives for datasets

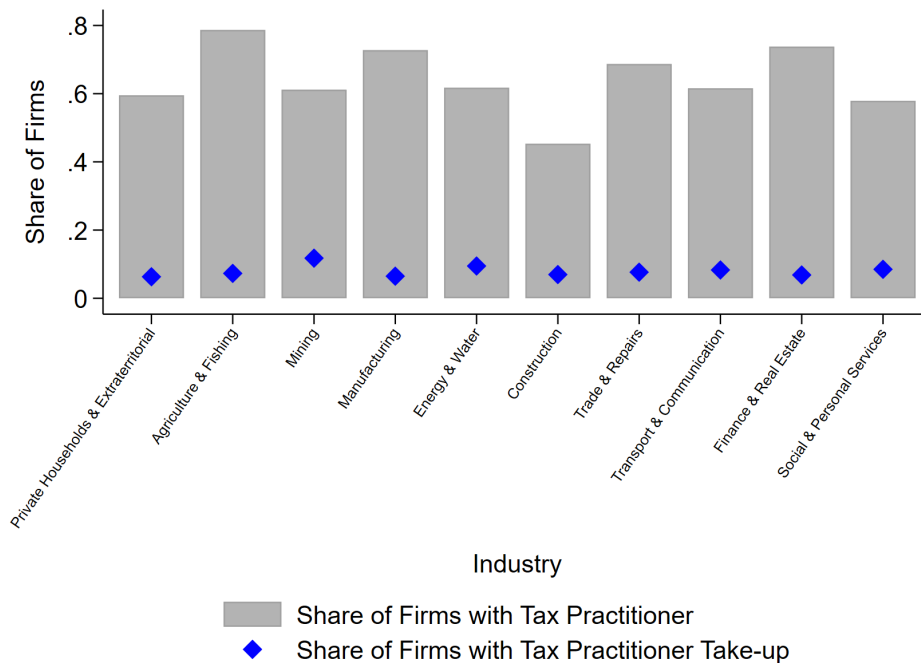
Figure A1: Tax practitioner use and take-up (for the cleaned dataset)



Note: the grey bars depict the fraction of firms in a given asset size group (zero and asset deciles, conditional on assets > 0, respectively) that rely on professional tax preparer services. The blue diamonds indicate the fraction of firms in the size group that start using tax preparer services for the first time during our data frame (the treated group).

Source: authors' compilation.

Figure A2: Tax practitioner use and take-up by industry in 2012



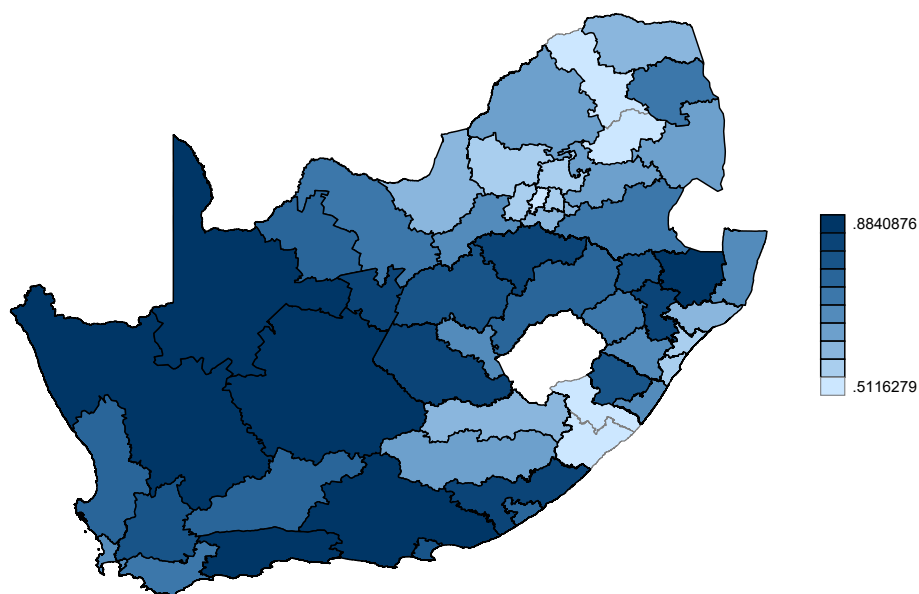
Note: the grey bars depict the fraction of firms in a given industry that rely on professional tax preparer services. The blue diamonds indicate the fraction of firms in the industry that start using tax preparer services for the first time during our data frame (the treated group).

Source: authors' compilation.

Figure A3: Mean tax practitioner by district municipalities

Mean share of TP Use

District municipalities in South Africa



Note: the map indicates the share of firm–year observations with a tax preparer in each district municipality during our data frame.

Source: authors' compilation.

Appendix B: Tax burden effects

This section presents a number of robustness checks for our main findings in the text. Table B1 and Figure B1 present estimates from specifications where we re-estimate the baseline models with four different outcome variables: the inverse hyperbolic sine-transformed tax payment, tax payments over assets, taxable income over the number of employees, and tax payment over the number of employees. Figure B2 presents estimates from dynamic DiD models analogous to the static results in Table 5, where we additionally control for consulting fees (a) and deciles of the asset distribution and asset growth, respectively (b). Table B2 and Figure B3 present estimates from specifications where we split our sample into firms located in municipalities with above and below median tax preparer penetration. All estimates confirm our baseline findings: tax preparer take-up exerts a negative and statistically significant impact on firms' tax reporting.

Finally, Figure B4 re-estimates our baseline models, restricting the data frame to fewer tax years, as indicated on the horizontal axis. The estimates suggest that the effect size becomes somewhat larger in later sample years, consistent with the notion that regulatory changes in the South African tax preparer market improved tax preparer quality and potentially also changed the selection of firms relying on tax preparer services to entities that more strongly benefit from tax preparer take-up and the alleviation of tax frictions.

Table B1: Results for other outcome variables and different firm size restrictions

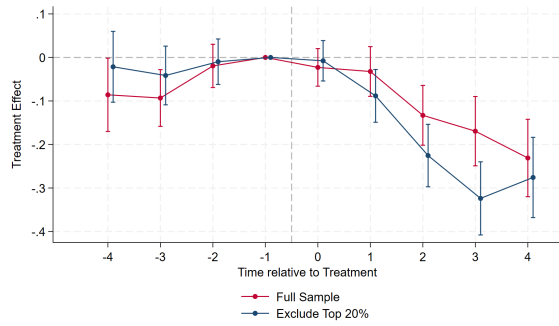
	(1) Full sample	(2) Drop top 5%	(3) Drop top 10%	(4) Drop top 15%	(5) Drop top 20%	(6) Drop top 30%	(7) Drop top 40%	(8) Drop top 50%
<i>Dependent variable: IHS-transformed tax payments</i>								
Take-up	−0.0193	−0.0110	−0.0251	−0.0485**	−0.0523**	−0.0616***	−0.0789***	−0.0608***
SE	(0.0221)	(0.0218)	(0.0218)	(0.0219)	(0.0218)	(0.0215)	(0.0210)	(0.0205)
SD	4.5083	4.0371	3.6812	3.3583	3.0519	2.4695	0.4459	1.6069
R ²	0.7267	0.7056	0.6844	0.6647	0.6503	0.6293	0.6270	0.6564
Observations	1,292,871	1,206,515	1,134,729	1,062,767	991,088	848,650	709,393	580,879
<i>Dependent variable: tax payments/assets</i>								
Take-up	−0.0014***	−0.0016***	−0.0019***	−0.0024***	−0.0024***	−0.0030***	−0.0032***	−0.0027***
SE	(0.0005)	(0.0005)	(0.0006)	(0.0006)	(0.0006)	(0.0007)	(0.0008)	(0.0009)
SD	0.0959	0.0923	0.0934	0.0948	0.0964	0.1001	0.1044	0.1110
R ²	0.6284	0.6108	0.6181	0.6286	0.6375	0.6570	0.6773	0.6987
Observations	761,027	710,688	669,058	627,755	586,569	504,042	422,370	341,297
<i>Dependent variable: taxable income/employees</i>								
Take-up	−15,132.86***	−13,130.25***	−14,290.84***	−13,131.81***	−11,547.2***	−10,989.83***	−10,589.48***	−9,990.46***
SE	(3,931.115)	(3,638.628)	(3,431.641)	(3,228.404)	(3,194.946)	(3,220.144)	(3,087.795)	(3,032.002)
SD	505,663.3	440,735.2	399,602.4	372,389.4	353,222.2	322,444.2	303,288.8	287,154.6
R ²	0.7661	0.7671	0.7662	0.7697	0.7767	0.7815	0.7946	0.8021
Observations	236,592	221,043	208,139	195,378	182,622	157,361	132,196	107,308
<i>Dependent variable: tax payments/employees</i>								
Take-up	−822.9258*	−333.3511	−302.4428	−358.625	−534.0512	−520.5793*	−371.5329	−590.9961**
SE	(445.9531)	(409.2099)	(370.2948)	(349.7297)	(330.7545)	(304.0536)	(287.433)	(266.9396)
SD	57,379.38	47,306.76	40,671.69	35,740.72	31,944.85	26,601.44	22,820.54	20,200.01
R ²	0.7241	0.6949	0.6749	0.6519	0.6436	0.6400	0.6645	0.6913
Observations	236,665	221,113	208,207	195,440	182,679	157,402	132,232	107,340
Asset control	x	x	x	x	x	x	x	x
FE:								
Firm	x	x	x	x	x	x	x	x
Company type * year	x	x	x	x	x	x	x	x
Province * year	x	x	x	x	x	x	x	x
Industry (3-digit) * year	x	x	x	x	x	x	x	x

Note: the table presents specifications that re-estimate our baseline model with different outcome variables: the inverse hyperbolic sine-transformed tax payment, tax payments over total assets, taxable income over the number of employees, and tax payments over the number of employees. SE depicts the estimated standard error, which accounts for clustering at the firm level. ***, **, and * indicate statistical significance at the 1, 5, and 10% level. The specifications drop large firms from the data with different levels of strictness, as indicated at the top of the specifications.

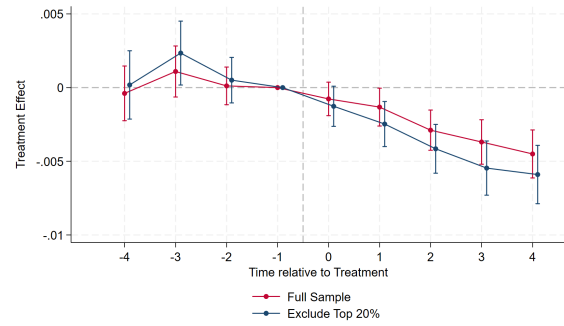
Source: authors' compilation.

Figure B1: Dynamic results for alternative outcome variables

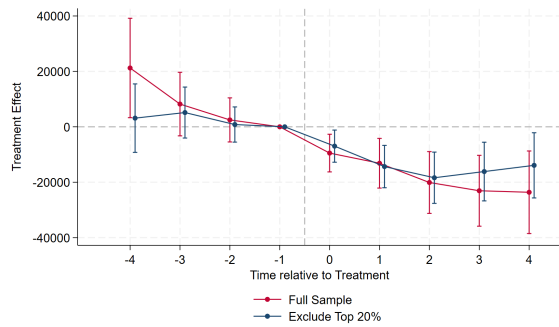
(a) Dependent variable: IHS-transformed tax payment



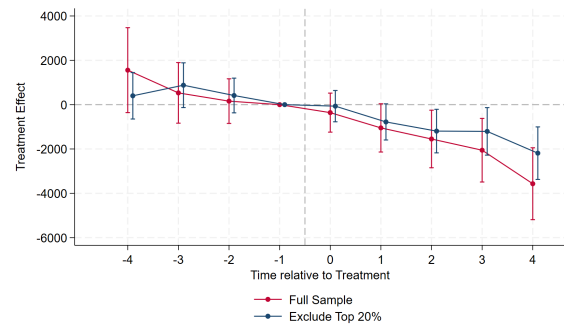
(b) Dependent variable: tax payment/assets



(c) Dependent variable: taxable income/employees



(d) Dependent variable: tax payment/employees

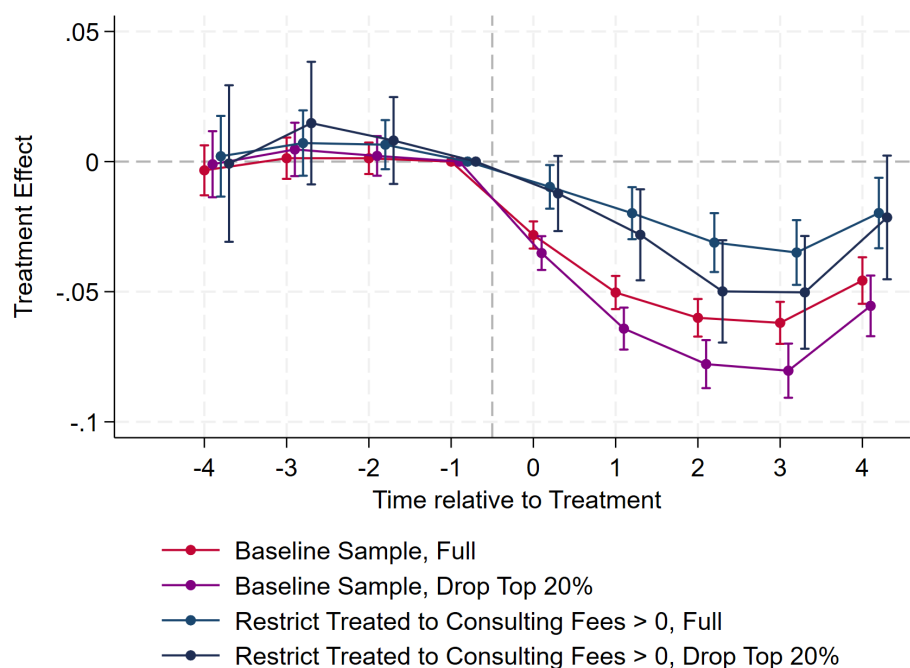


Note: the figure depicts estimates from dynamic DiD models, analogous to the ones presented in the main paper but with different dependent variables (the inverse hyperbolic sine-transformed tax payments (a), tax payments over assets (b), taxable income over the number of employees (c), and tax payments over the number of employees (d)).

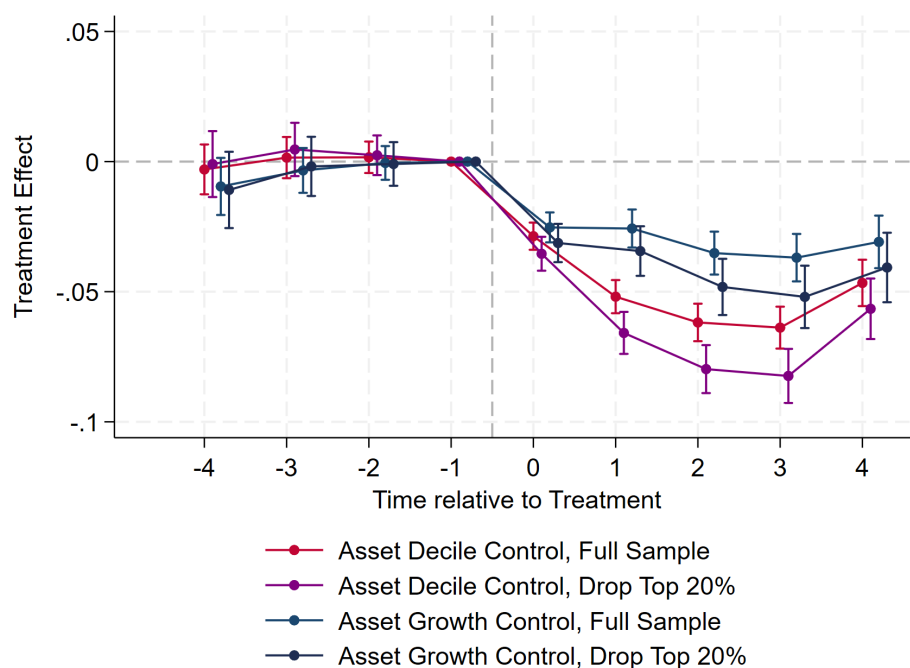
Source: authors' compilation.

Figure B2: Dynamic results for alternative controls

(a) Control for consulting fees



(b) Alternative asset controls



Note: the figure depicts estimates from dynamic DiD models, analogous to the static ones presented in the main paper but with different control variables. Part (a) shows the results that include controlling for consulting fees on the baseline sample and when we restrict treated firms to having consulting fees > 0. Part (b) presents the results when controlling for asset deciles and asset growth.

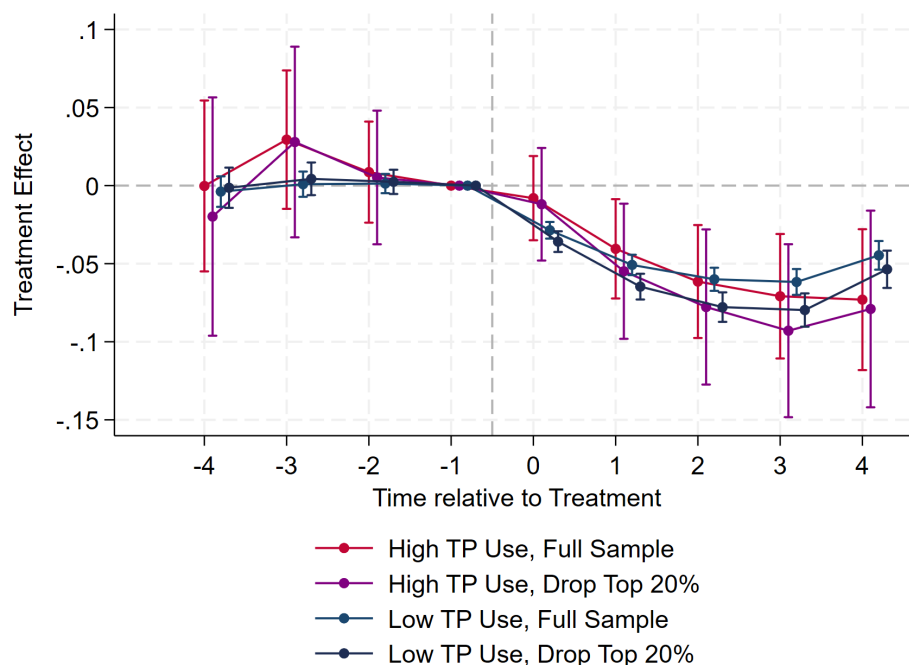
Source: authors' compilation.

Table B2: Municipality split: effect of tax practitioner take-up on reported taxable income

Dependent variable: taxable income/assets				
	(1)	(2)	(3)	(4)
	Tax practitioner use \geq median		Tax practitioner use $<$ median	
	Full sample	Drop top 20%	Full sample	Drop top 20%
Take-up	-0.0266**	-0.0240	-0.0403***	-0.0513***
SE	(0.0135)	(0.0162)	(0.0027)	(0.0034)
SD	0.4748	0.4969	0.4821	0.5179
R^2	0.7404	0.7359	0.7001	0.7054
Observations	21,902	16,929	737,702	568,352
Asset control	x	x	x	x
FE:				
Firm	x	x	x	x
Company type * year	x	x	x	x
Province * year	x	x	x	x
Industry (3-digit) * year	x	x	x	x

Note: the dependent variable is taxable income over assets. The specifications re-estimate the baseline model for municipalities with above and below median tax preparer penetration. ***, **, and * indicate statistical significance at the 1, 5, and 10% level. SE is the standard error, which accounts for clustering at the firm level.

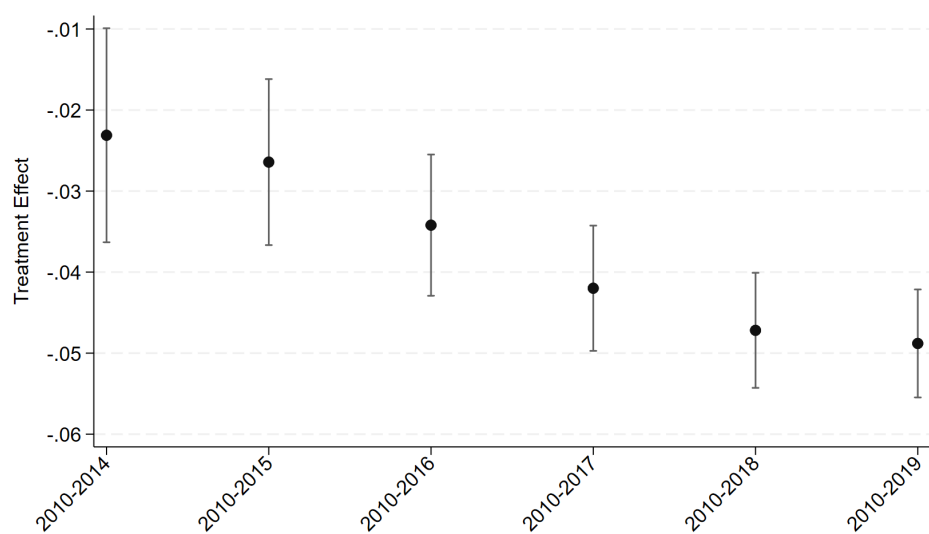
Source: authors' compilation.

Figure B3: Municipality split: effect on taxable income/assets

Note: the figure depicts dynamic DiD estimates, separately for firms located in district municipalities with above and below median tax preparer penetration.

Source: authors' compilation.

Figure B4: Varying sample periods: effect of tax practitioner take-up on reported taxable income



Note: the figure depicts estimates from specifications that resemble our base analysis but are restricted to shorter data frames, as indicated on the horizontal axis.

Source: authors' compilation based on data.

Appendix C: SBC analysis

Table C1: Effect of tax practitioners on SBC take-up: sample restricted to 'turnover'

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Panel A: Full sample</i>								
Take-up	0.0625***	0.0265***	0.0235***	0.0254***	0.0242***	0.0214***	0.0248***	0.0211***
SE	(0.0022)	(0.0021)	(0.0021)	(0.0021)	(0.0021)	(0.0021)	(0.0024)	(0.0021)
SD	0.4684	0.4684	0.4684	0.4685	0.4683	0.4684	0.4752	0.4683
R ²	0.7762	0.7837	0.7849	0.7843	0.7855	0.7868	0.7837	0.7867
Observations	1,424,821	1,424,821	1,424,820	1,421,933	1,418,137	1,415,261	1,280,193	1,418,128
<i>Panel B: Exclude top 20%</i>								
Effect	0.0887***	0.0419***	0.0390***	0.0407***	0.0401***	0.0367***	0.0381***	0.0362***
SE	(0.0029)	(0.0028)	(0.0028)	(0.0028)	(0.0028)	(0.0028)	(0.0030)	(0.0028)
SD	0.4759	0.4759	0.4759	0.4760	0.4758	.4759	0.4781	0.4758
R ²	0.7709	0.7805	0.7811	0.7811	0.7823	.7834	0.7831	0.7832
Observations	1,132,570	1,132,570	1,132,566	1,130,342	1,126,900	1,124,677	1,063,520	1,126,874
log(assets) control		x	x	x	x	x	x	x
<i>Fixed effects:</i>								
Firm	x	x	x	x	x	x	x	x
Year	x	x						
company type * year			x			x	x	x
Province * Year				x		x	x	
District municipality * year								x
Industry (3-digit) * Year					x	x		x
Industry (4-digit) * year							x	

Note: the dependent variable is a dummy reflecting the take-up of ETI claims. Take-up reflects the use of a tax preparer. SE is the estimated standard error, accounting for clustering at the firm level. ***, **, and * indicate statistical significance at the 1, 5, and 10% level. 'Mean' and 'SD' are the mean and the standard deviation of the dependent variable in the sample. Fixed effects are included as indicated.

Source: authors' compilation.

Table C2: Effect of tax practitioners on SBC take-up: sample restricted to 'turnover + industry'

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Panel A: Full sample</i>								
Take-up	0.0748***	0.0325***	0.0279***	0.0316***	0.0300***	0.0261***	0.0260***	0.0260***
SE	(0.0034)	(0.0034)	(0.0034)	(0.0034)	(0.0034)	(0.0034)	(0.0034)	(0.0034)
SD	0.4799	0.4799	0.4799	0.4799	0.4799	0.4799	0.4792	0.4799
R ²	0.7928	0.8007	0.8018	0.8013	0.8023	0.8036	0.8050	0.8035
Observations	760,204	760,204	760,201	759,322	757,840	756,956	733,572	757,820
<i>Panel B: Exclude top 20%</i>								
Effect	0.0981***	0.0473***	0.0433***	0.0468***	0.0452***	0.0416***	0.0417***	0.0408***
SE	(0.0043)	(0.0042)	(0.0042)	(0.0042)	(0.0042)	(.0042)	(0.0043)	(0.0042)
SD	0.4794	0.4794	0.4794	0.4794	0.4794	0.4794	0.4788	0.4794
R ²	0.7949	0.7244	0.8050	0.8049	0.8061	0.8072	0.8087	0.8070
Observations	632,780	632,780	632,779	632,174	630,694	630,087	610,563	630,658
log(assets) control		x	x	x	x	x	x	x
<i>Fixed effects:</i>								
Firm	x	x	x	x	x	x	x	x
Year	x	x						
Company type * year			x			x	x	x
Province * year				x		x	x	
District municipality * year								x
Industry (3d) * year					x	x		x
Industry (4d) * year							x	

Note: the dependent variable is a dummy reflecting the take-up of ETI claims. Take-up reflects the use of a tax preparer. SE is the estimated standard error, accounting for clustering at the firm level. ***, **, and * indicate statistical significance at the 1, 5, and 10% level. 'Mean' and 'SD' is the mean and the standard deviation of the dependent variable in the sample. Fixed effects are included as indicated.

Source: authors' compilation.

Table C3: Effect of tax practitioners on SBC take-up: sample restricted to 'turnover, industry, + MNE status'

Dependent variable: taxable income/assets								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Panel A: Full sample</i>								
Take-up	0.0750***	0.0326***	0.0280***	0.0316***	0.0301***	0.0262***	0.0261***	0.0261***
SE	(0.0034)	(0.0034)	(0.0034)	(0.0034)	(0.0034)	(0.0034)	(0.0034)	(0.0034)
SD	0.4801	0.4801	0.4801	0.4801	0.4800	0.4800	0.4793	0.4800
R ²	0.7927	0.8006	0.8017	0.8012	0.8022	0.8035	0.8049	0.8034
Observations	759,100	759,100	759,097	758,245	756,737	755,880	732,529	756,717
<i>Panel B: Exclude top 20%</i>								
Effect	0.0981***	0.0473***	0.0433***	0.0468***	0.0452***	0.0417***	0.0417***	0.0408***
SE	(0.0043)	(0.0042)	(0.0042)	(0.0042)	(0.0042)	(.0042)	(0.0043)	(0.0042)
SD	0.4794	0.4794	0.4794	0.4794	0.4794	.4794	0.4788	0.4794
R ²	0.7949	0.8043	0.8049	0.8049	0.8061	.8072	0.8087	0.8070
Observations	632,748	632,748	632,747	632,145	630,662	630,058	610,534	630,626
log(assets) control		x	x	x	x	x	x	x
<i>Fixed effects:</i>								
Firm	x	x	x	x	x	x	x	x
Year	x	x						
Company type * year			x			x	x	x
Province * year				x		x	x	
District municipality * year								x
Industry (3-digit) * year					x	x		x
Industry (4-digit) * year							x	

Note: the dependent variable is a dummy reflecting the take-up of ETI claims. Take-up reflects the use of a tax preparer. SE is the estimated standard error, accounting for clustering at the firm level. ***, **, and * indicate statistical significance at the 1, 5, and 10% level. 'Mean' and 'SD' is the mean and the standard deviation of the dependent variable in the sample. Fixed effects are included as indicated.

Source: authors' compilation.

Appendix D: ETI analysis

Table D1 depicts the cleaning steps undertaken to prepare the data for the ETI analysis. Figure D1 presents dynamic DiD estimates in the full data (ignoring the drop of the largest firms as in the main analysis).

Table D1: Cleaning final dataset: ETI analysis

	Description	Sample size after cleaning	% dropped
1	Merged firm-level IRP5 and CIT data	7,551,208	
2	Drop if only IRP5	6,954,704	7.90
3	Keep only relevant tax years (2014–20)	4,172,225	40.01
4	Drop if first year = 2014 (no pre-treatment observations)	2,324,051	44.30
5	Drop observations after firm stops using a tax practitioner	2,182,243	6.10
6	Drop always treated	1,748,567	19.87
7	Drop top 20% of assets	1,380,776	21.03
8	Keep only eligible firms (at least one ETI-eligible worker)	47,859	96.53

Note: the table depicts the cleaning steps taken in the preparation of the data for the analysis of the ETI scheme.

Source: authors' compilation.

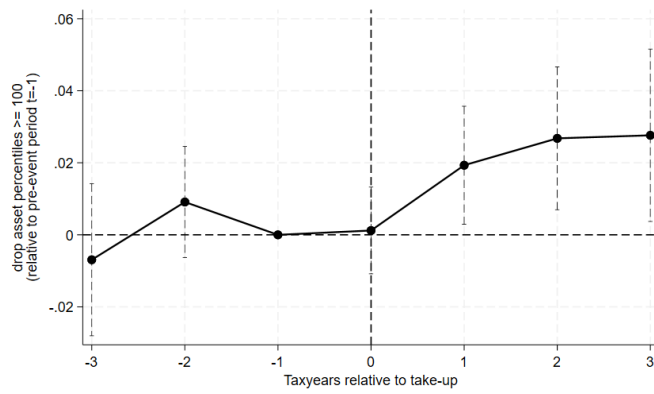
Table D2: Effect of tax practitioners on ETI take-up

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Panel A: Exclude top 20%</i>								
Take-up	0.0258***	0.0250***	0.0250***	0.0250***	0.0256***	0.0259***	0.0253***	0.0262***
SE	(0.0091)	(0.0090)	(0.0090)	(0.0091)	(0.0091)	(0.0092)	(0.0096)	(0.0093)
SD	0.3936	0.3936	0.3936	0.3936	0.3936	0.3936	0.3948	0.3937
R ²	0.7459	0.7460	0.7465	0.7470	0.7555	0.7571	0.7617	0.7611
Observations	35,031	35,031	35,031	35,014	34,631	34,614	32,902	34,600
<i>Panel B: Full sample</i>								
Take-up	0.0067	0.0060	0.0060	0.0061	0.0067	0.0074	0.0093*	0.0072
SE	(0.0052)	(0.0052)	(0.0051)	(0.0052)	(0.0052)	(0.0052)	(0.0053)	(0.0052)
SD	0.4591	0.3020	0.3020	0.3020	0.3022	0.3020	0.4598	0.4592
R ²	0.7168	0.7168	0.7173	0.7174	0.7222	0.7232	0.7283	0.7246
Observations	117,286	117,286	117,286	117,089	116,801	116,607	111,441	116,801
log(assets) control		x	x	x	x	x	x	x
<i>Fixed effects:</i>								
Firm	x	x	x	x	x	x	x	x
Year	x	x						
Company type * year			x			x	x	x
Province * year				x		x	x	
District municipality * year								x
Industry (3-digit) * year					x	x		x
Industry (4-digit) * year							x	

Note: the dependent variable is a dummy reflecting the take-up of ETI claims. Take-up reflects the use of a tax preparer. SE is the estimated standard error, accounting for clustering at the firm level. ***, **, and * indicate statistical significance at the 1, 5, and 10% level. 'Mean' and 'SD' are the mean and the standard deviation of the dependent variable in the sample. Fixed effects are included as indicated.

Source: authors' compilation.

Figure D1: Dynamic DiD: effect on ETI take-up, full sample (eligible firms)



Note: the figure depicts estimates from a dynamic DiD model in the full data (ignoring the removal of the largest firms from the data as in the main analysis).

Source: authors' compilation.

Appendix E: Employment structure

Table E1: Effect of tax practitioners on ETI employment structure: no assets control

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
<i>Panel A: Full sample</i>											
Take-up	0.0060***	0.0057***	0.0055***	0.0028***	0.0058***	0.0032***	0.0052***	0.0032***	0.0051***	0.0051***	0.0053***
SE	(0.0011)	(0.0011)	(0.0011)	(0.0011)	(0.0011)	(0.0011)	(0.0011)	(0.0011)	(0.0012)	(0.0011)	(0.0011)
SD	0.1735	0.1735	0.1736	0.1736	0.1735	0.1735	0.1736	0.1736	0.1750	0.1735	0.1736
R ²	0.6451	0.6457	0.6465	0.6621	0.6516	0.6670	0.6531	0.6684	0.6580	0.6541	0.6537
Observations	298,204	298,204	297,445	297,445	296,263	296,263	295,510	295,510	277,453	296,263	295,409
<i>Panel B: Exclude top 20%</i>											
Take-Up	0.0078***	0.0072***	0.0067***	0.0037*	0.0079***	0.0051**	0.0066***	0.0045**	0.0063**	0.0065***	0.0069***
SE	(0.0021)	(0.0021)	(0.0021)	(0.0021)	(0.0021)	(0.0021)	(0.0021)	(0.0021)	(0.0022)	(0.0021)	(0.0021)
SD	0.1943	0.1943	0.1944	0.1943	0.1944	0.1944	0.1945	0.1945	0.1959	0.1944	0.1945
R ²	0.6371	0.6374	0.6384	0.6500	0.6438	.6551	0.6453	.6566	.6499	0.6470	0.6460
Observations	128,005	128,005	127,773	127,773	126,856	126,856	126,628	126,628	119,345	126,844	126,590
log(employees) control				x		x		x			
<i>Fixed effects:</i>											
Firm	x	x	x	x	x	x	x	x	x	x	x
Year	x										
Company type * year		x					x	x	x	x	x
Province * year			x	x			x	x	x		x
District municipality * year										x	
Industry (3-digit) * year					x	x	x	x		x	x
Industry (4-digit) * year									x		
Assets-ventile * year											x

Note: the dependent variable is a dummy reflecting the take-up of ETI claims. Take-up reflects the use of a tax preparer. SE is the estimated standard error, accounting for clustering at the firm level. ***, **, and * indicate statistical significance at the 1, 5, and 10% level. 'Mean' and 'SD' is the mean and the standard deviation of the dependent variable in the sample. Fixed effects are included as indicated.

Source: authors' compilation.