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Heterogeneity and Persistence in Tax Responsiveness: Evidence from Owner-Managed Companies

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Abstract

We study responsiveness of owner-managed companies to a corporate income tax kink using Dutch tax records linking firms to their owners. The corporate taxable income elasticity (CETI) is 0.08, but tax sensitivity is over three times higher for firms using specific investment deductions. These are generous, allow for large depreciation and include assets that can reflect owner-managers' consumption. The CETI rises with deductions' use and is higher for large firms in industries with easy access to them. We document persistence at the kink, which is driven by large firms using deductions and whose owner-managers repeatedly target personal income tax kinks.

JEL codes: H24, H25, H26, H30.
Keywords: taxable income elasticity, owner-managed companies, tax deductions, bunching.

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1 Introduction

In many countries, most corporations are owner-managed firms where shareholders with a controlling stake act as managing directors. Owner-managers contribute to firms' success with capital and effort, blurring the distinction between entrepreneurs' labor income and firms' capital income (Smith, Yagan, Zidar, and Zwick, 2019). In addition, they control their business' financial account, leaving room for implementing optimization strategies.[1]

Understanding the behavior of owner-managed businesses is important for equity and efficiency reasons. First, owner-managers earn returns to both capital and labor and face multiple and interacting tax schedules. Second, owner-managed companies play an important role in the evolution of top incomes and wealth in many countries.[2] Third, they represent a large share of firms in many countries and contribute substantially to tax revenues.[3] Despite the importance of owner-managed firms for designing optimal labor and capital income taxation, for understanding the evolution of top incomes and wealth and for government revenues, evidence on the response of these firms and their owners to tax incentives remains scarce.

This paper studies how owner-managed companies respond to corporate taxes by investigating the main channels of adjustment, the main predictors of responsiveness, persistence in firms' and entrepreneurs' behavior, and the link between personal and corporate taxable income optimization. Firms' responses to tax incentives have traditionally been measured using the corporate elasticity of taxable income (CETI), i.e. the percentage change in corporate taxable income following a one percent increase in the net-of-tax rate. This parameter captures both real and tax adjustments (Feldstein, 1995, 1999; Slemrod, 1992) and importantly depends on the institutional framework and the existence of tax deductions (Doerrenberg, Peichl, and Siegloch, 2017; Kopczuk, 2005; Saez, Slemrod, and Giertz, 2012; Slemrod and Kopczuk, 2002).

We exploit a kink in the Dutch tax schedule where the marginal corporate income tax (CIT) rate increases by 5 percentage points (pp) for taxable income above €200,000. We employ bunching (Chetty, Friedman, Olsen, and Pistaferri, 2011; Saez, 2010) and probit analysis to uncover: (i) the magnitude of the response, as measured by the CETI; (ii) the channels of the response; (iii) the role of individual and firm characteristics; (iv) persistence in behavioral responses; (v) the link between personal and corporate income

[1]For instance, owner-managers can shift income over time and across tax bases and use the firm to finance personal expenses (Alstadsæter, Kopczuk, and Telle, 2014; Harju and Matikka, 2016a; Le Maire and Schjerning, 2013; Miller, Pope, and Smith, 2024).

[2]See Alstadsæter, Jacob, Kopczuk, and Telle (2016); Bruil, Van Essen, Leenders, Lejour, Möhlmann, and Rabaté (2024); Kopczuk and Zwick (2020); Smith et al. (2019) and figure A1 in the appendix.

[3]Owner-managed companies are mostly private corporations, i.e. the second largest group of firms in the Netherlands (Statistics Netherlands, 2022). They are often closely-held firms with highly concentrated ownership. On average over 2009–2018, owner-managed companies accounted for 24 percent of corporate income tax revenues (own data and Statistics Netherlands, 2024).

optimization. The goal of this paper is to understand *who* reacts to the tax system, *how* firms and their owners respond, and the role of persistence and entrepreneurs' behavior.

To do this, we use ten years of administrative data on the population of owner-managed companies. We link corporate tax filings to administrative data on their owner-managers via a unique identifier, which enables us to investigate the relationship between individual and firm-level responsiveness. As we can track taxpayers over time, we can also study persistence in firms' and entrepreneurs' behavior. Finally, as we observe several items from the corporate tax return, we can study firms' use of tax deductions.

We find a CETI of 0.08 at the €200,000 kink, which suggests that firms reduce taxable income by 0.5 percent in response to a 5 pp marginal tax rate (MTR) increase. However, we document large heterogeneity in the elasticity, with estimates two to ten times as large. This variation crucially depends on the use of tax deductions, on firms' and individuals characteristics, and on firms' persistence at the kink over time.

Tax deductions such as investment deductions (ID) and loss carry-forwards (LCF) can be used strategically to reduce corporate taxable income. We find that firms using energy and environment ID (EEID) are highly responsive to the kink. Compared to other deductions, EEID are more generous, give rise to larger depreciation and include assets that can reflect owner-managers' consumption. Our analysis shows that the intensity of EEID use spikes for firms reporting taxable income at the kink, and that the CETI increases with the frequency of EEID use. We estimate that tax deductions explain 46 percent of the CETI and lead to twice as large tax savings for firms at the kink compared to those further above or below the threshold – an effect driven by EEID.

Focusing on unincorporated firms – whose income is attributed to their owners and taxed under the personal income tax (PIT) schedule – we show that the spike in EEID use for firms at the kink relates to MTR changes. We find no spike in the use of EEID for unincorporated firms with €200,000 in taxable income where MTR are constant, but document an increase in EEID use for those with taxable income near the top PIT bracket, where MTR change. In addition, we find no evidence of EEID use for corporations declaring €200,000 in years when the MTR was constant.

We provide evidence that the intensive use of EEID by firms at the kink reflects intertemporal income shifting rather than real economic responses. Consistent with firms splitting (divisible) investments, we find that firms at the kink use EEID in consecutive fiscal years and use tax facilities that allow allocating deductions of (non-divisible) investments to multiple tax years. As firms at the kink use EEID more often, they accrue larger deductions over time. However, their growth is similar to that of investing firms with corporate taxable income just above or below the threshold.

We document heterogeneity in the CETI depending on firms' characteristics. First, we

show that firms in agriculture, forestry and fishing (AFF) industries are highly responsive to CIT changes, with a CETI of about 0.4. We argue that this is partly explained by easier access to EEID. In line with this, we find larger CETI estimates for firms in AFF using EEID. Second, we find that the CETI increases with firms' size and that the direction of the relationship depends on the kink at which the elasticity is measured.

We investigate what drives firms' persistence at the kink by testing the joint correlation of firms' and individuals' characteristics and the use of deductions with the likelihood of locating near the CIT threshold repeatedly over time. We find that persistent firms are large, operate in AFF, energy and human-capital intensive industries, use EEID repeatedly over time and write off large shares of their assets. Finally, firms that are persistently targeting the CIT kink are owned by individuals who also (repeatedly) locate near PIT kinks. In line with this, we find larger CETI for companies with owner-managers declaring personal taxable income near PIT kinks. When computing the personal elasticity of taxable income (PETI) for owner-managers with firms declaring corporate taxable income at the CIT kink, we find that it is higher than that of owner-managers with firms declaring corporate taxable income further away from the threshold. Taken together, this suggests that some entrepreneurs persistently optimize along multiple tax schedules.

Our contributions are as follows. First, we exploit detailed administrative data to show the most relevant adjustment channels underlying the CETI and the main predictors of responsiveness at the kink, which provides additional insights for understanding the "anatomy of the tax system" (Doerrenberg et al., 2017). We do that by systematically investigating the role of several tax deductions as well as individuals' *and* firms' characteristics.[4] By considering several deductions in our analysis and studying dynamics over time, we contribute to a strand of the literature using administrative data to investigate the mechanisms behind corporations' behavioral responses to taxation.[5] Our results show that that the presence of deductions possibilities increase bunching and the implied CETI. In weak enforcement context, growing evidence shows that corporations evade taxes by over-reporting hard-to-trace costs or under-reporting sales (Almunia and Lopez-Rodriguez, 2018; Bachas and Soto, 2021; Boonzaaier, Harju, Matikka, and Pirttilä,

[4]Previous literature focused either on the role of firms characteristics in responsiveness to CIT kinks (e.g., Coles, Patel, Seegert, and Smith, 2022) or on that of individual characteristics in responsiveness to PIT kinks (e.g., Aghion, Akcigit, Lequien, and Stantcheva, 2017; Bastani and Waldenström, 2021). A relevant exception is Bach (2017), who exploits CIT kink at €38,000 in France to study the effect of firms' return on assets and entrepreneurs' awareness of the CIT progressivity on the elasticity.

[5]Brockmeyer (2014) and Xu and Zwick (2020) consider the use of reported capital allowances, Chen, Qi, and Schlagenhauf (2018) of research and development (R&D) expenditures, Asatryan and Joulfaian (2022) of charity donation and Bukovina, Lichard, and Palguta (forthcoming), Coles et al. (2022) and Erickson, Heitzman, and Zhang (2013) of losses. Brockmeyer (2014) shows that firms bunching at the £10,000 CIT kink in the United Kingdom (UK) reduce taxable income by increasing investments giving rise to depreciation but finds no evidence of bunching using deductions nor evidence of larger depreciation for firms at the £300,000 kink. In contrast, we show that firms at the €200,000 kink in the Netherlands write off large shares of their assets and use EEID to reduce taxable income.

2019; Lobel, Scot, and Zúniga, 2024; Mosberger, 2016). We complement this literature by showing that in a high enforcement context, legal tax planning using deductions is an important mechanism to reduce taxable income. In addition, our results highlight the limitations of using the CETI as a sufficient statistics parameter for welfare analysis in presence of deduction possibilities (Bukovina et al., forthcoming; Doerrenberg et al., 2017; Kopczuk, 2005; Saez et al., 2012; Slemrod and Kopczuk, 2002).

Second, we document and measure the persistence of firms at CIT kinks and show that firms use EEID repeatedly over time to locate at the threshold. To the best of our knowledge, we are the first to document persistence in the behavioral responses that allow firms to target kinks and show that CETI estimates increase with firms' persistence. Our paper complements a modest literature documenting persistence of firms at kinks (Boonzaaier et al., 2019; Brockmeyer, 2014). Whereas Boonzaaier et al. (2019) suggest that small firms' persistence is the result of adjustments via sales misreporting, we show that larger firms are also persistent, and that repeated use of deductions plays a key role. Our results suggests that some taxpayers may be able to infinitely adjust corporate taxable income, as previously noted by Mortenson and Whitten (2020) for PIT kinks.

Third, this study contributes to the understanding of the behavior of owner-managed businesses by providing new evidence on the link between personal and corporate tax schedule responses. Joulfaian (2000) shows that managerial preferences for PIT evasion influence CIT evasion using audit data on corporations and their managers. In contrast, we study dynamics over time and focus on owner-managers' responsiveness to changes in MTR – which can capture both avoidance and evasion. We show that the persistence of firms at CIT kinks is driven by owner-managers that behave similarly also along the PIT schedule, and that the CETI for these firms is larger than the baseline.[6] By doing this, we contribute to a small yet growing literature using data linking individuals and firms to study owner-managers' behavioral responses to tax incentives (Bettendorf, Lejour, and van't Riet, 2017; Harju and Matikka, 2016a,b; Koivisto, 2024; Miller et al., 2024).

Finally, this study relates to a growing literature applying the insights of bunching methods typically used to study individuals' responses (e.g., Bergolo, Burdin, De Rosa, Giaccobasso, and Leites, 2021; Bohne and Nimczik, 2024; Chetty et al., 2011; Saez, 2010), to study firms' behavioral responses to corporate taxation (Bachas and Soto, 2021; Boonzaaier et al., 2019; Bosch and Lafont, 2018; Bukovina et al., forthcoming; Coles et al., 2022; Devereux et al., 2014; Lediga, Riedel, and Strohmaier, 2019; Lobel et al., 2024) and

[6]Devereux, Liu, and Loretz (2014) estimate the CETI for firms at the £10,000 CIT kink in the UK. For owners reporting corporate taxable income plus the owner-manager wage near PIT kinks, they find a CETI below the baseline. By focusing on the €200,000 kink, we consider larger firms and thus a different set of owner-managers. As we directly observe personal taxable income, we can precisely measure owner-managers' location at PIT kinks. Our results highlight the importance of accounting for heterogeneity in tax responsiveness of owner-managed businesses.

more broadly to a literature using quasi-experimental methods to study how corporate taxes affect firms (e.g., Chodorow-Reich, Smith, Zidar, and Zwick, 2024; Fuest, Peichl, and Siegloch, 2018; Harju, Koivisto, and Matikka, 2022; Kennedy, Dobridge, Landefeld, and Mortenson, 2024; Krapf and Staubli, 2024; Ohrn, 2018).

The remainder of the paper is structured as follows. Section 2 presents the main theoretical considerations and the institutional background. Section 3 describes the methodology and section 4 the data. Results are presented in section 5 whereas section 6 concludes.

2 Background

2.1 Taxation of owner-managed companies

Corporate taxes can distort firms' behavior in multiple ways. Slemrod (1992) classifies responses to CIT changes into real economic responses and tax adjustments.[7] The former reflects changes in economic behavior driven by lower after-tax rate of returns. For instance, corporate taxes can alter firms' economic decisions with respect to labor and capital inputs. This in turn can negatively impact investments, employment and the scale of production, and result in lower tax revenues. For owner-managers, disposable income is often tied to after-tax corporate profits. Thus, corporate taxation may have an additional real economic effect on profits by discouraging owner-managers' labor supply.

On the other hand, firms can respond to corporate taxes by shifting income across time, tax bases, entities and jurisdictions. These responses are known as tax adjustments and can consist both of tax planning – i.e. legal activities exploiting the interpretation and variability of tax law – as well as of illegal tax evasion activities. For example, with tax evasion firms can under-report sales or over-report expenditures. With tax planning, firms can shift income across time by delaying sales or by timing the realization of transactions that give rise to deductions. In addition, owners who work for the firm can shift income across tax bases. For instance, they can pay themselves a corporate tax exempt wage – although the extent to which this happens in practice depends on how wages are taxed at the individual level. Finally, companies with subsidiaries can shift income across entities and – if subsidiaries are located abroad – income can be shifted across jurisdictions.

Both real economic responses and tax adjustments are captured by the elasticity of taxable income (ETI).[8] The latter measures the percentage change in reported taxable in-

[7] See Coles et al. (2022) and Boonzaaier et al. (2019) for a formal discussion.

[8] As described in the seminal contributions of Feldstein (1995, 1999), the ETI summarizes all behavioral responses to tax incentives, and conditional on a set of assumption, it helps quantify welfare losses due to taxation. Several papers have discussed the conditions under which the ETI is a sufficient statistic for welfare analysis (e.g., Chetty, 2009; Doerrenberg et al., 2017; Saez, 2004; Saez et al., 2012). This discussion, however, is beyond the scope of this paper.

come z following an increase in the net-of-tax rate $(1-\tau)$ of one percent:

$$e(z) = \frac{dz}{z} \Big/ \frac{d(1-\tau)}{(1-\tau)} \tag{1}$$

An extensive literature has focused on the measurement and estimation of the personal elasticity of taxable income (PETI), yet equation 1 can also be used to quantify the CETI. As noted by Devereux et al. (2014), some of the costs incurred generating additional income are tax deductible for firms as owner-managers can generate additional income with tax deductible labor and capital investments. Thus, real responses to CIT – and the CETI – will typically be smaller than the PETI.

The extent to which firms engage in tax adjustments and their tax responsiveness are shaped by several interrelated factors. First, taxpayers' ability to make tax adjustments and the costs of doing so are tightly linked to a country's institutional and legal framework and the existence of tax deductions (Doerrenberg et al., 2017; Kopczuk, 2005; Saez et al., 2012; Slemrod and Kopczuk, 2002). In section 2.2, we review deductions granted by the Dutch tax system and the incentives they create, with a focus on investment deductions. Adjusting taxable income using (real) firm-level investments may be difficult as their returns are stochastic and typically realized over the long term (Krapf and Staubli, 2024), and investment decisions depend on expected tax rates over the investments' lifetime (Devereux et al., 2014). However, firms may have leeway with respect to the timing of investments. For instance, large investments can be split across fiscal years and planned investments rescheduled depending on firms' expected profits. Finally, in owner-managed companies, investments may also reflect entrepreneurs' consumption if they acquire assets for personal use while declaring them as business investments to benefit from corporate tax deductions (Kopczuk and Zwick, 2020; Miller et al., 2024).

Second, firms' ability to make tax adjustments may depend on the characteristics of their owner-managers, which are often positively correlated with firms' outcomes and responsiveness to tax incentives. For instance, Bastani and Waldenström (2021) find that owners of closely held corporations have high cognitive ability and are more likely to respond to PIT changes. This suggests that such high-ability owner-managers may also use their skills and knowledge to respond to CIT changes. Their ability to do so may in turn reflect owner-specific skills or the choice of skilled tax advisors.

Third, firms' characteristics may also affect their tax responsiveness. As discussed by Coles et al. (2022), one of such channels could be firm size. Larger firms may be more able to make tax adjustments as they can hire skilled tax advisors or shift income across business units and jurisdictions. However, large firms are more likely to be subject to statutory and tax audits, which may reduce responsiveness (Hoopes, Mescall, and Pittman, 2012). Other firms' characteristics that could affect their ability to make tax

adjustments are their experience and whether the company has subsidiaries. The former may imply that firms may have lower tax adjustment costs, e.g. if they have learned over time how to make tax adjustments efficiently. The latter could proxy firms ability to shift income across legal entities and reorganize activities within a group.

Firms' responsiveness may also depend on the industry in which they operate, e.g. if the industry correlates with owner-managers' information, skill set and human capital. Alternatively, there might be industry-specific spillovers in knowledge about tax optimization strategies, or specificity in industries' products or production processes that could make firms more likely or able to engage in tax planning. This could be the case if tax adjustment costs are industry specific, if the likelihood of firms using deductions depends on their industry, or in the presence of industry-specific deductions and profit exemptions.

2.2 Institutional setting

In the Netherlands, owner-managed firms are closely-held companies in which there is at least one owner who holds a substantial interest in the business, i.e. at least five percent of the shares. When substantial shareholders are working for the company – often as directors – they are called owner-managers or director-owners. Dutch companies are liable for CIT, whereas owner-managers are liable for PIT. Thus, owner-managers are individuals who control the company's financial account and face tax incentives both along the corporate and the personal income tax system. We discuss these incentives in the next sections, and report additional institutional details in the Online Appendix.

2.2.1 Corporate income tax system

Firms with legal personality are liable to pay corporate taxes according to a two-rate structure. Over 2009–2018 the MTR is 20 percent for taxable income up to €200,000 and 25 percent above this threshold.[9] This creates two kinks where MTRs change, i.e. one at zero with a 20 pp MTR change and one at €200,000 with a 5 pp increase. The base for the application of corporate taxes is corporate taxable income, which is determined by applying a number of tax adjustments to the book profits reported in the profit and loss statement. Table 1 provides a simplified summary of its derivation.

The starting point in the tax return is net profit, a measure of corporate income derived in the profit and loss statement by subtracting operating expenses from operating income and by adding results from participation, financial and extraordinary results. Operating income depends on corporate revenue, which is a function of both capital and labor inputs. Operating expenses encompass costs for goods and materials, labour and pension costs – including owner-manager's wage and pension provisions – as well as asset depreciation. In the Netherlands, investments can typically be depreciated by at most 20 percent per

[9]The tax rate above the threshold in 2009-2010 was 25.5 percent.

Table 1 – *Definition of corporate taxable income*

Operating income
− Operating expenses
• Costs of goods and materials
• Costs of wages and pension
• Depreciation
= Operating result
+ Other results
= Net profit
− Balance of investment deductions
• Research and development investment deductions (RDID)
• Energy and environment investment deductions (EEID)
• Small investment deductions (SID)
• Previous years investment deductions (PID)
• Disinvestment addition
− Loss carry-forward
− Other deductions
= Corporate taxable income (z)

Notes: This table shows the stylized computation of corporate taxable income based on the profit and loss statement and on the corporate tax return reported in the Online Appendix.

year over a minimum period of five years. Qualifying environmentally-friendly assets can be arbitrarily depreciated up to 75 percent.

Next, several items are subtracted from net profits within the tax return. We focus on investment deductions and loss carry-forwards, and discuss other deductions in the Online Appendix. Taxpayers are allowed a tax deduction over the standard asset depreciation for qualifying investments, namely the small-scale ID (SID), the EEID and the R&D ID (RDID). SID are applicable to a large variety of assets and can be claimed directly within the tax return. To be eligible, companies must report aggregate yearly investments between a minimum and a maximum amount. From 2010, 28 percent of investments are deductible up to a threshold, above which the deduction decreases.[10]

EEID consist of the energy and the environmental ID, which are granted to assets included in the energy and the environment lists compiled by the Netherlands Enterprise Agency (NEA). Whereas some assets transcend industry boundaries, other technologies are sector-specific. Importantly, investments such as (electrically powered) passenger cars qualify for EEID – but not for SID – and can reflect owner-managers' personal consumption.[11] The rate at which EEID are applied and the maximum size of qualifying investments are substantially larger than with SID – with rates up to 58 percent – but claiming EEID is time-consuming for the taxpayer. Specifically, the investment must be

[10]The regressive schedule and maximal yearly SID create an incentive to split large investments over several years. Figure A2 shows that the frequency of firms claiming the maximal SID amount is substantially higher than that of firms claiming deductions just a few thousand euros below it.

[11]According to CE Delft (2023), in 2020 electrically powered vehicles constituted almost 50 percent of deduction applications for environmental assets. This percentage dropped to 20 percent in 2021, after the introduction of a limit to a maximum of 10 vehicles per entrepreneur qualifying for the deduction.

reported to the NEA within three months of entering an obligation with the supplier.

The Dutch tax system offers some flexibility with respect to the claim of deductions. Both EEID and SID are typically applied to the tax return in the year when the firm starts using the asset. If the asset is not used, the deduction is limited to the amount paid in the financial year. The remainder can be deducted in subsequent years as previous years' investment deductions (PID), but no later than in the year when the asset is put into use. Thus, deductions for divisible investments can be claimed in multiple years by timing purchases and quantities, whereas deductions for lumpy investments can be spread across tax years by planning the timing of commissioning, down payments to the supplier, and when the asset is put into use.[12] Over 2012–2016 investments in innovation qualified for a RDID with rates ranging between 40 and 60 percent. The deduction was granted following certification of the R&D activities by the NEA. In contrast to SID and EEID, however, firms had to submit RDID applications for the estimated costs a month before the start of R&D work, making these deductions less flexible.

Finally, firms can deduct previous years' losses from the corporate tax base. Current losses are first offset against the previous year's profits (carry-back), and then with future profits (carry-forward). Loss offset provisions are automatically administered by the tax authorities, leaving no room for firms to manipulate them ex-post. However, when reporting corporate taxable income, firms may account for the stock of losses carried forward from previous years (Coles et al., 2022). For instance, a firm with a large stock of losses reporting taxable income at the kink has an incentive to declare additional income that year, e.g. by accelerating the sale of assets or the conclusion of sales.

2.2.2 Personal income tax system

The Dutch tax system attributes personal taxable income to three "boxes", i.e. three income components which are taxed differently (Cnossen and Jacobs, 2022). Box 1 taxes progressively labor and self-employment income, including the wage received by owner-managers. Box 2 taxes dividends distributed to individuals with a substantial interest and capital gains realized on the sale of (part of) the company at a flat rate. Box 3 applies to remaining personal capital income items above an exempted amount, and includes dividends received from share ownership below 5 percent. A fictitious rate of return is applied with the statutory tax rate, resulting in a *de facto* net wealth tax.

[12]See the Online Appendix. Using deductions to shift income intertemporally is attractive in the Netherlands as accrual accounting limits opportunities for intertemporal shifting of sales and expenses by making tax payments tightly linked to the financial statement (Coles et al., 2022). Deductions could also facilitate evasion, e.g. if firms misreport investments. As evasion costs are higher for traceable transactions, firms over-report hard-to-trace expenses rather than those generating paper trails (Almunia and Lopez-Rodriguez, 2018; Lobel et al., 2024). EEID are subject to automatic and on-site random checks by the NEA and produce paper trails, making them less suitable for evasion. SID produce fewer paper trails, yet they are smaller and capped in yearly amounts. Firms seeking to lower taxable income through evasion might thus find manipulating input costs simpler and more flexible than adjusting ID.

As MTR on labor income are higher than those levied on capital income, owner-managers have an incentive to lower income declared in box 1, finance consumption through the firm and favor dividends over wages. To limit this, the Payroll Tax Act requires owners of a substantial interest working for the firm to pay themselves the highest wage of (i) 75 percent of the wages paid to owner-managers in similar companies; (ii) the highest wage of employees in the company; (iii) the annual reference wage (RW) specified by the tax authorities. Bettendorf et al. (2017) show that many owner-managers interpret the RW as an absolute legal minimum, as their wages peak at the reference level.[13] Kinks along the PIT schedule also create incentives for owner-managers to reduce personal taxable income. Specifically, a change in MTR of 10–12 pp in the top tax bracket creates a salient incentive for owner-managers to declare box 1 income below the kink.

3 Method

3.1 Bunching analysis

We use the bunching method pioneered by Saez (2010) and Chetty et al. (2011) in the context of personal taxable income to identify the CETI. We summarize the method briefly in this section and provide more details in the Online Appendix. The approach rests upon a neoclassical model featuring taxpayers with convex preferences smoothly distributed across the population and discontinuities in MTR that create kinks in their budgets. In the context of corporate taxable income, taxpayers are firms with concave production functions (convex cost functions) that maximize after-tax profits.

The key insight of the method is that a MTR change at a specific point in the tax schedule from τ_1 to τ_2, with $\tau_2 > \tau_1$, will induce taxpayers with taxable income z above the threshold z^* to reduce it. As taxpayers reduce z at most up to the kink, there will be a spike in the income density of taxpayers at the threshold, i.e. bunching. In the presence of risk aversion, adjustments costs or optimization frictions that do not allow for precise targeting of the kink, there will be a bunching window around the threshold rather than a spike (Anagol, Davids, Lockwood, and Ramadorai, 2024; Devereux et al., 2014; Kleven, 2016; Kleven and Waseem, 2013).

Saez (2010) shows that the ETI $e(z)$ can be obtained by looking at excess bunching, i.e. by comparing the income density distribution of taxpayers at the kink-point with a counterfactual density measuring what would have been the distribution had there not

[13] Owner-managers can pay themselves lower wages if they provide valid explanations to the tax authorities. Although the RW lies below the top PIT bracket, deductible box 1 items may create incentives to declare wages above the reference amount. With the personal MTR depicted in figure A3 for 2016, the tax wedge between progressive PIT on wages versus paying the RW and distributing remaining income as dividend is over 8 percent for owner-managers distributing €200,000.

been a kink. The compensated CETI identified at the threshold z^* is then:

$$e(z^*) = \frac{b}{z^* \cdot log(\frac{1-\tau_1}{1-\tau_2})} \tag{2}$$

where $log(\frac{1-\tau_1}{1-\tau_2})$ percent represents the change in net-of-tax rate. The only parameter that needs to be estimated in equation 2 is the relative excess mass of taxpayers at the threshold, b. It indicates the share of taxpayers bunching at the kink relative to the counterfactual density. The key identifying assumption is that without the kink, taxpayers at the threshold would behave similarly to those further away from it.

As explained in section 2, the Dutch tax system creates two kinks. We focus on the €200,000 threshold, as at this level of taxable income there is no other aspect changing for firms other than the MTR and it can be more easily argued that firms just above and just below the threshold are comparable. Under this assumption, the counterfactual distribution can be predicted from the observed density outside the income range affected by the kink (bunching window) but close enough to the kink, referred to as estimation range r. The estimate of the excess mass b is then given by:

$$\hat{b} = \frac{\hat{B}}{\left[\frac{\delta^+ - \delta^-}{w}\right]^{-1} \sum_{\delta^-}^{\delta^+} \hat{N}_j} \tag{3}$$

Where δ^- and δ^+ are the lower and upper bound of the bunching window. The taxable income distribution is normalized by the kink and w is the bin width used to group taxable income.[14] $\hat{B}$ is the estimated number of individuals bunching within the window. It is obtained subtracting from the effective number of taxpayers in taxable income bin j, N_j, the counterfactual number of taxpayers that would have been in income bin j in the absence of the kink, $\hat{N}_j$, i.e. $\hat{B} = \sum_{\delta^-}^{\delta^+} N_j - \hat{N}_j$.

The counterfactual number of individuals within income bin j, $\hat{N}_j$, is estimated following Chetty et al. (2011). Specifically, we use a local polynomial regression on binned data, which excludes bins comprised in the bunching window:

$$N_j = \sum_{i=0}^{q} \beta_i \cdot Z_j^i + \sum_{k=\delta^-}^{\delta^+} \gamma_k \cdot \mathbb{I}[Z_j = k] + \varepsilon_j \tag{4}$$

Z is the midpoint of an income bin and γ_k represent bin fixed effects for each bin in the excluded range within the bunching window. The optimal polynomial order q is chosen using the Bayesian information criterion (BIC) and the bunching window is obtained using Bosch, Dekker, and Strohmaier (2020)'s reiterated data driven procedure summarized in

[14] That is, the kink represents bin zero and that the remaining distances are expressed in percentage of z^*. This implies that z^* in equation 2 is expressed in units of bin widths. We set $w =$ €500 to satisfy observational requirements when decomposing the initial sample into different sub-samples.

the Online Appendix. Standard errors are computed using bootstrapping techniques.[15]

We compare the baseline CETI to that obtained for different subgroups, selected depending on firms' characteristics, the use of deductions and owner-managers' characteristics. As formally derived by Bastani and Waldenström (2021), the counterfactual distribution is allowed to change by subgroup. As noted by Kleven (2016), in the presence of elasticity heterogeneity, the bunching method identifies the ETI at the average response rather than the average ETI. Thus, although recent literature has questioned whether it can capture all behavioral responses to taxation in the spirit of Feldstein (1995)'s ETI, the method is well suited for investigating the existence of differences between subgroups within a population (Bastani and Waldenström, 2021).

3.2 Probit analysis

As discussed in section 2, firms' use of tax deductions may be correlated with both owner-managers' and firms' characteristics. We investigate the *joint* correlation of the use of tax deductions and characteristics with the likelihood of locating near the kink and the persistence of firms at the threshold by complementing the bunching analysis with probit regressions following Mortenson and Whitten (2020). Specifically, we estimate:

$$\mathbb{I}[Z_{itj} \in \mathcal{Y}] = \lambda_t + \alpha_j + \sum_{k=1}^{N} \beta' X_{it} + \epsilon_{itj} \tag{5}$$

$\mathbb{I}[z_{it} \in \mathcal{Y}]$ is an indicator taking the value of one if corporate taxable income z_{it} of firm i in year t is within $\mathcal{Y}$, a small window centered at threshold z^* and set to reflect the bunching window $[\delta^-, \delta^+]$.[16] λ_t and α_j are year and industry fixed effects, X_{it} is a vector of covariates and ϵ_{itj} the error term. Standard errors are clustered at the firm level. X_{it} contains dummies for both individuals' and firms' characteristics and for the use of tax deductions. Assuming that they do not affect the likelihood of unintentionally locating near the kink – conditional on being in a range r around it – the coefficients can be interpreted as correlations with the likelihood of bunching at the threshold, i.e. average marginal effects (Mortenson and Whitten, 2020). Using this method, we can also investigate which characteristics and deductions affect firms' persistence at the kink. To do so, we replace the dependent variable with an indicator taking the value of one

[15] Following Chetty et al. (2011), we add randomly sampled estimated residuals from equation 4 to the predicted values and re-estimate $\hat{b}$ from the newly simulated data, with 100 replications. 95 percent confidence intervals for $\hat{b}$ are computed by multiplying the standard error $\hat{b}_{se}$ by ± 1.96. As in Chetty et al. (2011), we implement an upward correction of N_j above z^* ensuring that counterfactual and observed distributions integrate to one. This raises the distribution to the right of the kink and renders the estimates sensitive to the selection of the range r over which the polynomial is fitted. We choose an estimation range $r = \pm$€25,000 i.e. all companies with taxable income within ±€25,000 of the kink.

[16] As in the bunching analysis, we restrict the sample to a range of ±€25,000 around the kink and use the bunching window derived using Bosch et al. (2020)'s procedure in the bunching method.

if corporate taxable income z_{it} of firm i in year t is within a narrow range of the kink $[\delta^-, \delta^+]$ and if there is at least another year when the firm is observed and its corporate taxable income falls within ±€500 of corporate taxable income declared that year.

4 Data

4.1 Sample

We combine administrative and tax return data provided by Statistics Netherlands over 2007–2018. For each year, we observe all private corporations in the Netherlands with at least one owner-manager. Due to tax reforms in earlier years, we focus on 2009–2018.[17] Thanks to a unique id, we can match firm-level tax return data with individual-level administrative and tax return data on owner-managers. At the firm level, the unit of observation is the corporate tax declaration. That is, we observe both single firms and corporate groups, i.e. multiple firms reporting corporate taxable income as one entity for tax purposes. For each corporation, we observe the owner-manager(s) id and use it to include additional individual-level data on the entrepreneur(s). Thus, the data contains characteristics for both the director-owner and the company. We summarize the main variables below and discuss data construction and assumptions in the Online Appendix.

We observe corporate taxable income before and after LCF and CIT paid by firms each year. Moreover, we observe total SID, EEID, RDID, PID and disinvestment additions, and can compute for each firm the intensity of deduction use over time. Since we observe firms' creation year, we can determine their age. In addition, the data contain information on the number of employees, total assets, equity, net profits, Nace industry classification code and whether the firm is part of a corporate group. For a subset of firms, we obtain additional information on companies' balance-sheets and profit and loss statements. For these firms, we observe among others turnover, operating expenses – including costs for goods and materials, wage and pension costs, depreciation – and operating result.

For each owner-manager, we observe personal taxable income from her tax return and the wage that she receives from the company. We identify owner-managers reporting box 1 taxable income within ±€500 range of any of the PIT thresholds in a given year or in any year, as well as those with a wage within ±€500 of the reference wage. For both variables, we identify companies for which at least one such entrepreneur exists. Finally, we observe additional individual-level covariates such as gender, age and education.

[17] The data covers about 70 percent of Dutch limited liability companies (see Online Appendix). After years in which the threshold was €22,689 with MTR changes of 4–5 pp, a three brackets structure was introduced in 2007. Firms paid 20 percent CIT rate on taxable income up to €25,000; 23.5 percent over €25,000–60,000 and 25.5 percent above €60,000. The schedule was changed back to a two rate structure in 2008, with a 20 percent CIT rate on taxable income up to €275,000 and 25.5 percent above it.

4.2 Summary statistics

Owner-managed companies in the Netherlands comprise a heterogeneous set of firms. As shown by the left panel of table 2, the majority of these firms are small corporations with a single owner. Corporate taxable income declared by these companies is skewed, as the median firm reports approximately €10,000 whereas the average is about four times as large. Although median total assets for these firms are about €350,000, there is substantial heterogeneity as the top 10 percent of firms have assets near €2.4 million.

The right panel of table 2 shows summary statistics for the sample of firms that at any point in time have declared corporate taxable income within €25,000 of the €200,000 corporate tax kink. These represent 9 percent of the initial sample, yet they account for 26 percent of all assets and pay 32 percent of corporate income taxes – with mean reported corporate taxable income of about €146,000. These firms are larger, older, and tend to record losses less often than firms in the full sample.

Owner-managers are middle-aged males who typically manage only one business and declare average personal taxable income below the top PIT bracket. The wage they receive from the company accounts on average for the majority of their declared personal taxable income, and is substantially smaller than average dividends they receive from their firm. Owner-managers of companies that at any point in time have declared corporate taxable income within ±€25,000 of the €200,000 corporate tax kink are somewhat older, report higher personal taxable income and receive larger dividends.

Table 3 summarizes firms' tax deductions. The share of firms using ID is substantially higher for firms reporting taxable income within ±€25,000 of the kink compared to the full sample – especially for EEID and PID (in relative terms). However, the increased use of deductions does not result in higher average or median EEID and PID. In contrast, both the share of firms using SID and the average and median SID increase near the kink. For these firms, the share of firms using RDID remains stable, but average and median deductions decrease. Finally, firms near the kink record losses less often, leading to a lower share using LCF, although the size of LCF increases.

Tables A1 and A2 in the appendix show the share of firms in each industry and report median total assets by industry, separately for the full sample and for firms declaring corporate taxable income within €25,000 of the kink in a given year. The industries with the highest number of firms are financial and insurance; professional, scientific and technical activities; wholesale and retail; construction; health and social work and manufacturing. Although they comprise only about 2 percent of all companies, firms operating in agriculture, forestry and fishing industries have the largest median assets.

For a subset of firms – referred to as the "matched sample" – we observe additional firm-level accounting information and report summary statistics in table A3. Whereas

Table 2 – *Summary statistics: Owner-managers and their firms*

	Full sample				Corporate taxable income near the kink			
	Mean	p10	p50	p90	Mean	p10	p50	p90
Firm-level variables								
Number of director-owners	1.16	1.00	1.00	2.00	1.24	1.00	1.00	2.00
Number of years observed	5.94	2.00	6.00	10.00	7.86	3.00	10.00	10.00
Firm age	10.65	1.50	7.50	22.50	12.86	3.00	10.50	24.50
Number of employees	5.58	0.50	1.13	10.50	9.14	1.00	2.70	21.00
Total assets	1,046.11	46.22	348.78	2,380.85	2,586.42	411.61	1,478.29	5,837.98
Equity	553.33	(45.42)	123.49	1,376.10	1,586.52	137.04	765.11	3,890.56
Net profits	78.53	(22.11)	20.44	214.49	239.83	40.77	164.91	470.03
+ director-owners' wage	134.42	0.77	73.58	303.73	326.31	97.12	249.50	588.36
Investment balance	5.77	0.82	3.72	12.83	7.65	1.06	5.86	14.50
Loss carry-forward	30.87	0.85	9.43	73.58	74.37	2.40	31.82	184.22
Corporate taxable income	39.70	(22.16)	10.15	126.30	147.99	28.70	131.16	279.14
Number of firms	380,616				33,545			
Owner-level variables								
Number of firms	1.02	1.00	1.00	1.00	1.03	1.00	1.00	1.10
Number of years observed	6.10	2.00	6.00	10.00	7.96	3.00	10.00	10.00
Personal taxable income	53.93	16.87	47.84	94.76	72.55	27.50	63.14	126.69
Director-owner wage	48.68	9.68	43.99	92.09	69.76	19.05	63.32	126.33
Dividend income	116.53	2.33	49.99	263.85	175.98	13.23	100.21	376.53
Director-owner age	50.33	36.00	49.50	65.00	51.43	38.50	51.00	64.50
Gender (M)	0.77	0.00	1.00	1.00	0.77	0.00	1.00	1.00
Number of director-owners	424,483				48,118			

Notes: The table presents summary statistics for selected variables from 2009–2018, with firm-level data in the top panel and individual-level data in the bottom panel. Data is averaged over time by company (top) and by individual (bottom). Monetary values are in 2015 thousand euros and winsorized at the 1st and 99th percentiles after computing averages. The left panel shows statistics for the full sample of firms, while the right panel focuses on firms (director-owners of companies) that at any point in time report taxable income within ±€25,000 of the corporate tax kink. Negative values are in parenthesis.

matched firms are larger in terms of profits and total assets for the full sample, they are on average smaller for the sample of firms with taxable income at least once within ±€25,000 of the kink. Focusing on median firms, however, the matched sample of firms with taxable income near the kink is overall comparable to the unmatched sample.

Table 3 – *Summary statistics: Tax deductions*

	Full sample					Corporate taxable income near the kink				
	Share	Mean	p10	p50	p90	Share	Mean	p10	p50	p90
Investment balance	0.23	8.23	0.77	3.64	15.52	0.46	8.49	0.84	4.94	15.62
Disinvestment addition	0.02	4.60	0.60	2.25	9.20	0.03	4.94	0.54	2.38	11.68
ID	0.22	8.78	0.85	3.94	15.55	0.45	9.04	0.97	5.29	15.67
– EEID	0.01	33.82	1.69	13.96	38.84	0.04	27.79	1.69	11.82	46.40
– SID	0.21	5.67	0.84	3.59	14.98	0.43	6.58	0.94	4.84	15.46
– PID	0.00	36.73	0.62	7.44	43.08	0.01	21.92	0.50	5.92	37.85
– RDID	0.01	22.04	1.18	6.43	23.49	0.01	9.76	0.45	7.34	30.24
LCF	0.05	41.56	0.79	9.24	75.11	0.04	101.71	2.17	36.03	234.85
Observations	2,260,087					50,723				

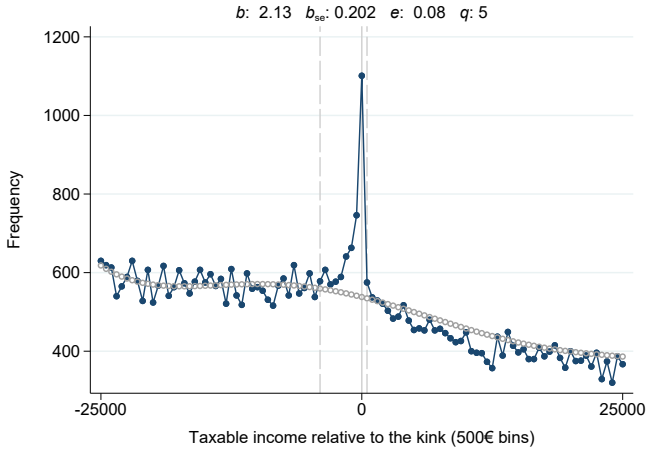
Notes: The table reports summary statistics for non-zero tax deductions of owner-managed firms over 2009–2018. The left panel shows results for the full sample while the right panel focuses on firms with corporate taxable income within €25,000 of the kink in year t. Monetary values are expressed in 2015 thousand euros. Share indicates the proportion of firms in the sample using the deductions.

5 Results

5.1 Do firms respond to the tax system?

We estimate bunching of firms at the €200,000 threshold where the marginal CIT changes by 5 pp using the methodology outlined in section 3.1. Figure 1 displays the results obtained by pooling observations over 2009–2018 and plotting the frequency of firms in each €500 corporate taxable income bin (solid dots) relative to the distance to the threshold, €25,000 above and below the kink. The hollow dots represent the counterfactual estimated with equation 4. The vertical solid line at zero marks the kink and the vertical dashed lines indicate the bunching window.

Figure 1 – *Bunching at the €200,000 threshold*



Notes: The figure plots taxable income bins of €500 relative to the distance to the €200,000 threshold on the x-axis and the frequency of firms in each bin on the y-axis (solid dots). The hollow dots represents the counterfactual density estimated using equation 4 for firms with taxable income within ±€25,000 of the kink. The taxable income distribution is normalized by the threshold, marked by the solid vertical line. The vertical dashed lines represent the bunching window, as estimated by Bosch et al. (2020)'s data driven procedure. b is the relative excess mass, b_{se} is its standard error, e is the elasticity and q the polynomial order determined using the BIC. The sample consists of owner-managed companies over 2009–2018.

We find that firms respond to the tax system, although the magnitude of the behavioral response is small. The excess mass is 2.13, meaning that there are approximately two times more observations around the threshold than what we would have expected had there not been a kink at €200,000. That is, over a thousand firm-year observations bunch exactly at the kink whereas less than 600 pay the higher CIT rate. The CETI of 0.08 implies that for a 5 pp change in the MTR at the kink, firms reduce corporate taxable income by approximately 0.5 percent.[18] The small magnitude of micro-elasticities esti-

[18]See table A4. The CETI is comparable to the 0.13–0.17 elasticity found by Devereux et al. (2014) for *all* UK companies at the £300,000 kink. With a 0.13 CETI, they estimate a marginal deadweight

mated using bunching methods has often been attributed to the presence of optimization frictions and to the fact that these tend to capture short-term responses to price incentives along the intensive margin (Chetty et al., 2011; Kleven, 2016).[19] In addition, Aronsson, Jenderny, and Lanot (2022) show that relative to other estimators, bunching estimates tend to be biased downwards. Thus, the baseline CETI is likely a conservative estimate.

As discussed in section 3.1, the key assumption in bunching is that in the absence of the kink, firms at the threshold would have behaved similarly to firms further away from it. We provide support to the assumption's validity by exploiting the fact that in 2008 the kink was at €275,000, with a constant 20 percent MTR around €200,000. We compare the 2008 inflation adjusted distribution around this amount to that of 2009, the first year with a kink at €200,000. Figure A5a shows that the 2008 taxable income distribution is smooth around €200,000, mitigating identification concerns discussed by Blomquist, Newey, Kumar, and Liang (2021) and Bertanha, McCallum, and Seegert (2023).[20] Kleven and Waseem (2013) argue that identification of b may be undermined if companies report corporate taxable income at round numbers, yet in figure A7 we find no evidence of bunching at round numbers near the kink.[21] Finally, our estimate is robust to alternative specifications of the input parameters in figures A8a, A8b, A8c and to the using a balanced panel of firms in figure A8d.

5.2 Are firms persistently targeting the kink?

As figure 1 pools 2009–2018 data, we investigate to what extent firms locate at the kink repeatedly over time. We study persistence by applying bunching to firms remaining within ±€500 of taxable income declared in a given year in any other year. Figure 2 shows that for these firms the elasticity is 0.82, over ten times larger than the baseline. Figure A9 shows that the share of firms locating within €500 of taxable income declared in the previous years is close to zero for firms declaring income above and below the

cost of 6 percent. As described in the Online Appendix, we find that the marginal deadweight cost is 4 percent. Our CETI is also in line with an earlier Dutch estimate provided by Bosch and Lafont (2018). The Online Appendix also provides suggestive evidence that the response observed is mostly driven by avoidance responses built within the tax return.

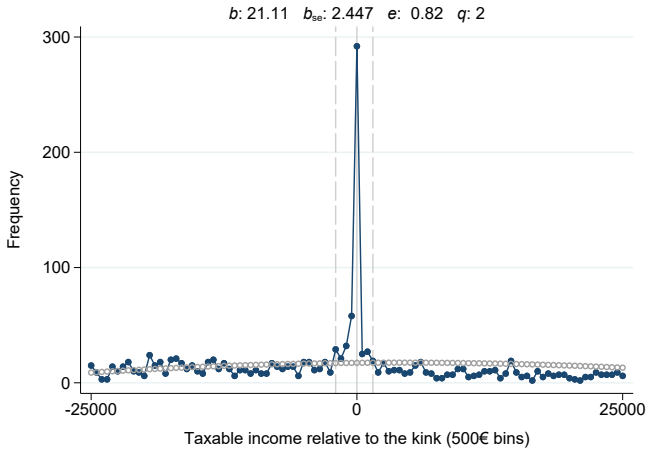
[19]Extensive margin adjustments include (i) changing legal form, (ii) altering corporate structures (e.g. by splitting the company) and (iii) shifting income across firms. In our setting, we can investigate (iii) by checking whether the CETI changes for companies that are part of a group and for those whose entrepreneurs own more than one company. Figure A4 shows that estimates are not substantially larger for these firms, which mitigates concerns of substantial extensive margin responses via this channel.

[20]As shown by figures A5b, A5c and A5d, there is no evidence of bunching at kinks in 2007 and 2008. Firms may forego responses if they expect threshold changes and in presence of kink specific adjustment costs, similarly to individuals (Mavrokonstantis and Seibold, 2022). Alternatively, there may be information frictions connected to learning about the kink. In figure A6 we plot yearly CETI estimates and the share of companies in the bunching window each year. However, we find no evidence of a gradual "learning" of the kink, as the share of bunching firms and the CETI remain relatively stable overtime.

[21]This is hard to reconcile with theories of reference dependence which typically explain asymmetric bunching around kinks (Kleven, 2016). The observed asymmetry in figure 1 thus suggests that some taxpayers interpret the kink as a notch, i.e. a threshold where average tax rates rather than MTR change.

threshold, but over 0.10 for firms reporting taxable income at the kink, and even larger when considering a balanced panel of firms. We return to persistence in the next sections.

Figure 2 – *Persistence at the €200,000 threshold*



Notes: The figure plots taxable income bins of €500 relative to the distance to the €200,000 threshold on the x-axis and the frequency of firms in each bin on the y-axis (solid dots). The hollow dots represent the counterfactual density estimated using equation 4. The taxable income distribution is normalized by the kink, marked by the solid vertical line. The vertical dashed lines represent the bunching window, as estimated by Bosch et al. (2020)'s data driven procedure. b is the relative excess mass, b_{se} is its standard error, e is the elasticity and q the polynomial order determined using the BIC. The sample consists of owner-managed companies over 2009–2018 that report taxable income within ±€500 of the amount declared in year t in any other year, and within ±€25,000 of the kink.

5.3 How do firms respond?

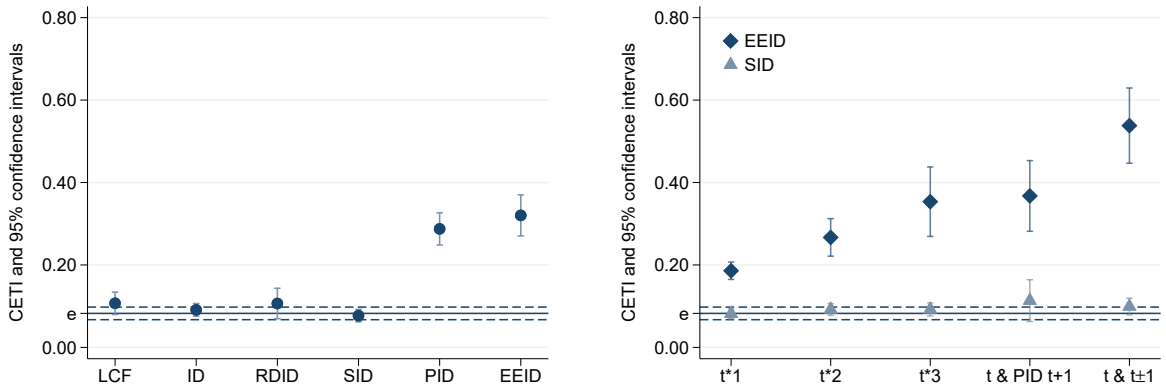
Companies can time or manipulate tax deductions to reduce corporate taxable income. Figure 3a shows the CETI for firms using various deductions in year t, and its 95 percent confidence interval. The horizontal lines mark the baseline CETI of figure 1 and its confidence interval. Due to observational requirements, to compute the CETI for RDID and PID we select firms that have used them at any point in time.[22] We find that the CETI is in line with the baseline estimate for firms using LCF and ID. However, when decomposing ID, we find a CETI of about 0.3 for firms using PID and EEID. This suggests that firms use these deductions to lower taxable income.

As discussed in section 2.2, both SID and EEID can be used for intertemporal income shifting. However, EEID may be preferred over SID due to their generosity, flexibility in yearly deductions, and inclusion of assets that can be used for personal consumption. One way to shift income intertemporally is by timing down payments and the year the asset is first used, then claim PID in subsequent years. We investigate whether the larger responsiveness of firms using PID in figure 3a is driven by SID or EEID. Figure A11

[22]We find similar results using a €1,000 bin to estimate the CETI for firms using RDID and PID in year t (figure A10a), and selecting a balanced panel of firms (figure A10b).

Figure 3 – *Bunching at the €200,000 threshold: Use of tax deductions*

(a) *Use of tax deductions* (b) *Repeated use of tax deductions*



Notes: The figures plot CETI estimates for different subgroups of owner-managed companies using tax deductions over 2009–2018 and reporting corporate taxable income within €25,000 around the €200,000 kink. The horizontal lines represent the baseline elasticity of figure 1 and its 95 percent confidence interval. In figure (a) the solid dots represent the estimated CETI for firms that use tax deductions in year t and the range around it is the 95 percent confidence interval. Due to observational requirements research and development investment deductions (RDID) and previous years' investment deductions (PID) show the CETI for firms that at any point in time have used the deduction. ID includes RDID, small investment deductions (SID), energy and environment investment deductions (EEID) and PID. Figure (b) displays the CETI for firms using repeatedly EEID or SID. The first three estimates report the CETI for firms using EEID (SID) at least once, twice or three times ($t*i,\ i=1,2,3$) over the time period they are observed. t & $t\pm1$ refers to firms using EEID or SID in year t as well as in $t+1$ or $t-1$. t & PID $t+1$ refers to firms that at any point in time use EEID or SID in year t and PID in $t+1$. For SID, we require that no EEID is used in t. In both figures, the bin width is of €500, the bunching window is determined using Bosch et al. (2020)'s data driven procedure and q using the BIC. Table A4 reports the underlying estimates.

shows that the share of firms using EEID (SID) but not SID (EEID) in year t and PID in following years is higher (constant) for firms with taxable income at the kink, suggesting that EEID drive the result. In line with this, the CETI for firms that at any point use EEID in t and PID in $t+1$ is 0.37 and larger than for those using SID in t and PID in $t+1$ (figure 3b). This suggests that EEID are used for intertemporal income shifting to reduce taxable income up to the kink, while the remainder is saved for later years.

Alternatively, firms can use ID for intertemporal income shifting by allocating divisible investments to different tax years. Figure A12 shows that the share of firms using EEID in a year and in the previous or following year is larger for firms at the kink than for those just above or below the threshold. However, the share of firms using SID in consecutive years is stable around the kink. Figure 3b reports the CETI for firms using EEID or SID in year t and in $t+1$ or $t-1$. While for SID the CETI aligns with the baseline, for EEID it is 0.54, suggesting that firms split large (divisible) investments qualifying for

EEID over consecutive fiscal years and use deductions for intertemporal income shifting.

Splitting investments across fiscal years may lead to a higher frequency of deductions' use for firms at the kink. Figure A13 shows the total number of times a firm has used each tax deduction over the time period it is observed, averaged across all firms reporting taxable income within a given income bin. The figure shows that the distribution of the intensity of the use of EEID and PID spikes at the kink, as companies at the kink use EEID and PID much more often than firms just above or below the threshold. Figure A11 shows that the use of PID is again driven by EEID, as the total number of times firms use EEID in year t followed by PID in $t+1$ is substantially higher for firms at the kink. Persistent use of EEID, in turn, results in a higher CETI, as shown by the first three estimates of figure 3b. When restricting the sample to firms that have used EEID at least once, twice, or three times ($t*i,\ i=1,2,3$) over the period they are observed, we find that the CETI increases with the number of years in which firms have used EEID.[23]

We address concerns that the use of EEID by firms locating at the kink may be spurious in two ways. First, we investigate EEID use by unincorporated firms, whose income is attributed to business-owners and taxed under the PIT. Figure A15a shows that there is no spike in EEID use for unincorporated companies with taxable income at €200,000, for which the MTR is constant. In contrast, figure A15b shows that EEID use increases for firms reporting taxable income near the highest PIT kink, where MTR increase for unincorporated firms. Second, we investigate EEID use for corporations with taxable income near €200,000 in 2007–2008, when the MTR was constant around this amount. Figure A16 shows that in contrast to 2009–2018, there is no spike in the average share of firms using EEID nor in the total use of EEID for firms with taxable income at the kink.

The fact that firms allocate EEID to different fiscal years by using them in consecutive years and in combination with PID suggests that the response observed is driven by tax adjustments rather than by real economic changes. However, firms may undertake larger investments to use EEID. Figure A17 shows that yearly deductions as a share of firms' assets are smoothly distributed around the threshold but that over time firms at the kink use larger EEID as they use deductions more often. If these correspond to larger (productive) investments, firms may experience differential growth rates. On the other hand, if firms increase investments solely to reap tax benefits, there could be negative growth effects. Figure A18 plots average firm growth before and after the first EEID use, for firms that at any point in time use EEID. The figure shows that growth is relatively

[23]As shown by figure A10d, results are robust to the selection of a balanced panel of firms. In figure A14 we investigate how the CETI changes with the repeated use of other tax deductions. Although we find somewhat larger elasticities for firms repeatedly using RDID and maximal SID, the CETI does not seem to increase linearly with the use of these deductions. However, we find some evidence that the CETI increases with the frequency of use of LCF, which is further supported when investigating the role of the repeated use of LCF in the persistence of firms at the kink (table A11).

smooth around the threshold, and that firms do not grow more after using EEID.[24] This suggests that higher intensity of EEID use for firms at the kink does not seem to lead to any real economic effect, but is rather associated with tax adjustments.

We investigate to what extent the response in figure 1 is explained by LCF and ID by adding them to taxable income and recomputing the elasticity, holding the bunching window constant. Figure A21 shows a 0.04 elasticity, meaning that tax deductions explain 46 percent of the baseline CETI. We compute tax savings as the difference between the CIT due on tax deductions plus taxable income and the actual CIT, expressed as a share of CIT before tax deductions. Figure A20 shows that using tax deductions doubles tax savings for firms at the kink compared to firms declaring taxable income just above or below the threshold, and that the spike is driven by EEID. This, along with the findings on persistence, suggests some taxpayers may be able to infinitely adjust taxable income, as previously noted by Mortenson and Whitten (2020) for PIT kinks.[25]

As discussed in section 2.2, investments also give rise to depreciation opportunities that further reduce taxable income. In figure A22a we use the matched sample to investigate how the CETI changes for firms with large yearly depreciation, measured as a share of total assets in $t-1$. A depreciation is considered large if it falls within the top 25 percent of those observed within the bunching range. We find that firms with large depreciation are more responsive to CIT changes, with a 0.23 CETI.[26] Considering firms with large depreciation and that also use EEID the CETI is 0.47 (table A4), implying the largest responsiveness for firms using a combination of both strategies.[27]

5.4 Who responds to the tax system?

5.4.1 Firm heterogeneity

We investigate whether the CETI depends on firms' characteristics. Figure 4a shows that firms' responsiveness increases with firms' size, measured in terms of assets and employees.[28] Previous literature found that small firms at low kinks are the most responsive,

[24]Growth effects may not be captured if there is a lag in assets use. However, results are unchanged when considering a balanced panel of firms observed until 2018 (figure A19). Alternatively, EEI may only lead to green economy externalities. As we lack data quantifying the magnitude of energy and emissions savings, we cannot investigate this further and cannot draw welfare implications on EEID's desirability.

[25]This challenges the view that taxpayers respond to changes in MTR with a marginal adjustment of corporate income. Plausibly, the presence of such taxpayers might affect the validity of the derivation of the ETI from b, depending on the relative share of such taxpayers. However, b should remain unaffected, meaning that the results we find in terms of differential responses across subgroups remain valid.

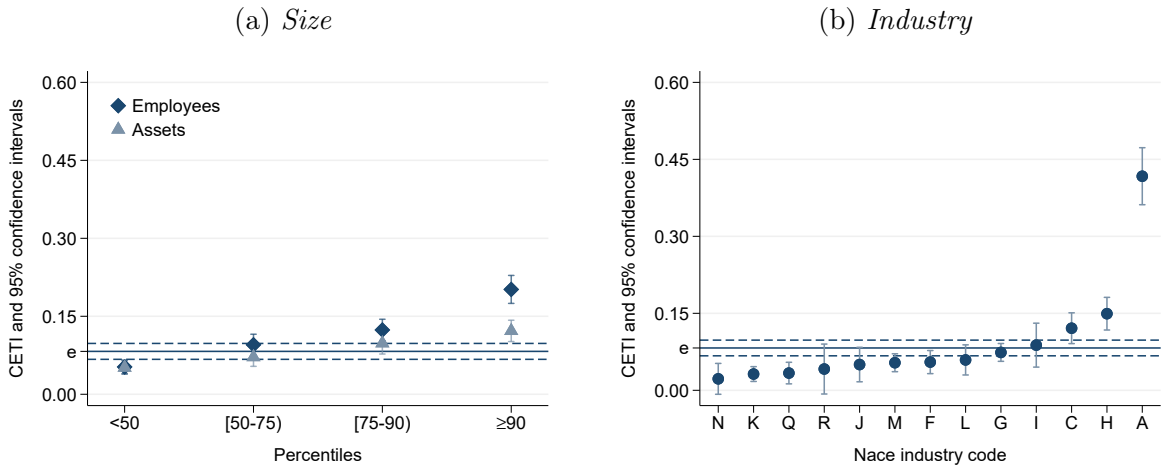
[26]Average depreciation as a share of previous year's assets spikes for firms at the kink (figure A22b). In figure A22 we find no evidence of stronger responsiveness for other adjustment margins within a firm's balance sheet, such as over-reporting or anticipating the purchase of goods and materials to increase costs and reduce profits, and augmenting (director-owners') wages or (pension) reserves within the firm.

[27]For firms with large depreciation in t and that at any point used EEID. With $w =$€1,000, the CETI is over six times the baseline for firms that in t have large depreciation and use EEID (table A5).

[28]Results are robust to using a balanced panel of firms over 2009–2018 (figure A24a). We find no systematic differences in CETI estimates depending on other firms' characteristics, except for the number

often arguing that this is due to lower audit rates (e.g. Coles et al., 2022; Devereux et al., 2014; Hoopes et al., 2012). However, we do not find a smaller CETI for firms that at any point qualified for an audit (table A6).[29] Our findings can be reconciled with the literature by accounting for different technologies used by firms. At lower kinks, small firms face low audit probability, lowering the costs of engaging in tax adjustments that fall within evasion strategies. As the audit probability increases, the relationship between firms' size and responsiveness to tax kinks can revert, e.g. if larger firms hire more sophisticated tax advisors implementing complex but legal tax avoidance practices. When considering firms at the zero CIT threshold in figure A25, we find a negative relationship between responsiveness and firms' size – supporting this hypothesis.[30]

Figure 4 – *Bunching at the €200,000 threshold: Firms' heterogeneity*



Notes: The figures plot CETI estimates for different subgroups of firms based on firms' characteristics. The blue dots represent the CETI and the range around it the 95 percent confidence interval. The horizontal lines show the baseline CETI of figure 1 and its related confidence interval. The bin width is €500 and the sample consists of owner-managed companies over 2009–2018 with corporate taxable income within €25,000 of the €200,000 kink. Figure (a) shows the CETI for different percentiles of firms' size within the estimation range, defined in terms of assets and employees. Figure (b) shows the CETI for different industries described in table A6. In both figures, the bunching window is determined using Bosch et al. (2020)'s data driven procedure and q using the BIC.

In figure 4b we study whether there is a differential response as measured by the CETI depending on firms' industry. The figure shows that the CETI is in line with that of figure 1 for all industries except for companies in agriculture, forestry and fishing (Nace code A), for which the CETI is 0.4.[31] The large responsiveness of these companies may be

of owners (table A6). However, this result is not robust to the joint significance test (table A9). In contrasts with the findings of Bach (2017) for French firms at a low CIT kink, in figure A23 we find that due to large assets, firms with taxable income at the kink have below average returns on assets (ROA).

[29]The Netherlands mandates independent audit of companies meeting at least two of three criteria in two consecutive years: (i) assets ≥€6 million, (ii) turnover ≥€12 million and (iii) employees ≥50.

[30]The figure reports the excess mass as the CETI cannot be computed with equation 2 when $z^* = 0$.

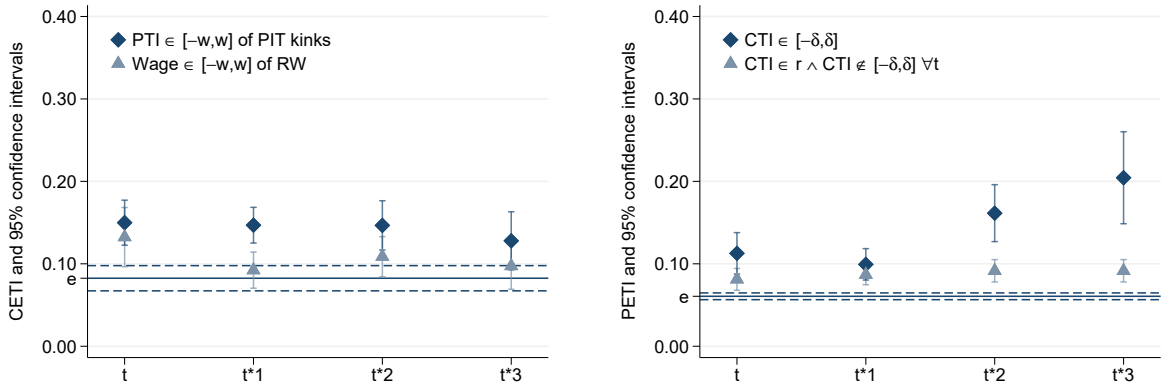
[31]Results are robust to using a balanced panel of firms over 2009–2018 (figure A24b). Not all industries

driven by industry specific abilities or knowledge on how to manipulate taxable income. As mentioned in section 2, EEID are available for assets that can be industry specific and AFF tend to use EEID most often (table A2). Restricting the sample to firms operating in AFF and using EEID at least once we find an elasticity of 0.78 (table A5), which suggest that firms in AFF may be able to access EEID more easily.[32]

5.4.2 Individual heterogeneity

Figure 5 – *Owner-managers' behavior along PIT and CIT kinks*

(a) *CETI* (b) *PETI*



Notes: Figure (a) plots the CETI for different subgroups of owner-managed companies with corporate taxable income within €25,000 of the €200,000 kink over 2009–2018. The blue dot is the estimated elasticity and the range around it is its 95 percent confidence interval. The horizontal lines represent the baseline elasticity of figure 1 and its 95 percent confidence interval. The bin width is $w =$€500. PTI (wage) $\in [-w, w]$ indicates firms with at least one owner-manager reporting personal taxable income (wage) within ±€500 of any of the PIT kinks (RW). Figure (b) plots PETI estimates at the top PIT kink for owner-managers whose firm(s) report corporate taxable income within the bunching window of figure 1 (CTI $\in [-\delta, \delta]$) and those with corporate taxable income within ±€25,000 of the €200,000 kink, but never within the bunching window (CTI $\in r \wedge$ CTI $\notin [-\delta, \delta]$ $\forall t$). Results are for owner-managers with personal taxable income within ±€10,000 of the kink over 2009–2018. The bin width is $w =$€500 and the horizontal line marks the PETI for the full population of owner-managers. t refers to the CETI (PETI) for firms (owner-managers) whose owners (firms) display the behavior in year t whereas $t * i$, $i = 1, 2, 3$ marks the repeating of the behavior at least once, twice, or three times over the time period they are observed. In both figures, the bunching window is determined using Bosch et al. (2020)'s data driven procedure and q using the BIC.

We investigate whether tax responsiveness varies with individuals' characteristics, and in particular with owner-managers' behavior along the PIT schedule.[33] Owner-managers

are included in the figure due to the bunching method's observational requirements.

[32]Due to observational requirements, this estimate is obtained using a bin width of €1,000. As discussed in section 2, firms in these industries also benefit from profit exemptions. As we do not observe them in our data, we are not able to investigate whether these drive the remaining response.

[33]In table A8 we study the role of other individual characteristics for firms with one owner-manager where entrepreneurs are director-owners of only one firm. However, we do not find substantial differences in responsiveness across owner-managers' age, education level, civil status and role within the household.

responding to tax incentives along the PIT schedule may be more responsive to CIT changes, either due to their personal characteristics and/or to the characteristics of the tax advisors that they hire. Figure 5a shows that the CETI is larger than the baseline for firms where there is at least one owner-manager who pays herself the reference wage or who reports taxable income near PIT kinks in year t.[34] In addition, the CETI is larger than the baseline for firms whose owner-manager(s) repeatedly target PIT kinks, and to a lesser extent for those repetedly targeting the RW. This suggests that owner-managers optimizing along the PIT schedule are more responsive to CIT kinks.

In an additional test, we compute the PETI at the highest PIT kink for owner-managers whose companies report corporate taxable income within the bunching window and within ±€25,000 of the CIT kink but never in the bunching window – in year t and repeatedly over time.[35] Figure 5b shows that the PETI is higher for entrepreneurs targeting the CIT kink, and it increases for those doing this persistently. In contrast, owners locating within the estimation range but never at the kink repeatedly over time display a stable PETI, suggesting that the response is not merely a function of larger corporate taxable income. Taken together, this suggests that some owners may plan their taxes aggressively and optimize both along the personal and the corporate tax schedule.

5.5 Correlates in bunching

We have shown that the use of specific deductions and some firms' and entrepreneurs' characteristics increase firms' responsiveness. As the use of deductions and characteristics may be correlated with each other, in this section we test their *joint* correlation with the likelihood of reporting corporate taxable income near the kink, as described in section 3.2. Table 4 reports results for selected variables – which overall confirm our results.[36]

Column 1 shows that firms using EEID in year t are 2.1 pp more likely to report corporate taxable income near the kink relative to the baseline bunching probability. In addition, firms that are using EEID repeatedly over time are 3.3 pp more likely to locate near the kink. Columns 2–4 dive deeper into the mechanisms and show that EEID are used in combination with PID, enabling intertemporal income shifting of investment deductions across multiple tax years. For firms with EEID and no SID in year t and PID in $t+1$ the likelihood of locating at the kink increases by nearly 15 pp. The consecutive use of EEID is significant at the 10 percent level in column 3, yet it is not statistically different

[34] As shown by figure A27, the result is robust to selecting a balanced panel of firms.

[35] As in Bastani and Waldenström (2021), we find that individuals' responsiveness to PIT kinks is higher for owners of closely-held companies than of non-corporate businesses. In figure A26, we report the PETI for the Dutch resident population over 2009–2018 and of owners of unincorporated firms and closely held-corporations. We focus on the lowest and the highest PIT kinks as they are the most salient. We set $r = \pm$€10,000 to avoid overlap across tax brackets and $w =$€500.

[36] See table A9 for results including all control variables. As shown by table A10, results are robust to different model specifications, a narrower definition of the dependent variable (bunching window) and sample range and to the use of a balanced panel of firms over 2009–2018.

Table 4 – *Bunching at the €200,000 threshold: Correlates in bunching*

	(1)	(2)	(3)	(4)
EEID in t	0.021***	0.026***	0.031***	0.025***
	(0.008)	(0.009)	(0.007)	(0.009)
PID in t	0.005	0.005	0.006	0.005
	(0.017)	(0.017)	(0.017)	(0.017)
EEID $t*2$	0.033***			
	(0.007)			
PID $t*2$	0.025	0.034*	0.027	0.026
	(0.018)	(0.018)	(0.019)	(0.019)
EEID in t & $t-1$ or $t+1$		0.028*		0.022
		(0.016)		(0.016)
EEID in t & PID in $t+1$ (no SID in t)			0.155***	0.147***
			(0.044)	(0.044)
Depreciation p75-p100	0.025***	0.026***	0.026***	0.026***
	(0.005)	(0.005)	(0.005)	(0.005)
Assets p50-p75	-0.002	-0.002	-0.002	-0.002
	(0.004)	(0.004)	(0.004)	(0.004)
Assets p75-p90	0.000	0.002	0.002	0.002
	(0.005)	(0.005)	(0.005)	(0.005)
Assets p90-p100	0.005	0.006	0.006	0.006
	(0.006)	(0.006)	(0.005)	(0.006)
Employees p50-p75	0.011***	0.011***	0.011***	0.011***
	(0.004)	(0.004)	(0.004)	(0.004)
Employees p75-p90	0.015***	0.015***	0.015***	0.015***
	(0.005)	(0.005)	(0.005)	(0.005)
Employees p90-p100	0.023***	0.024***	0.024***	0.024***
	(0.006)	(0.006)	(0.006)	(0.006)
Agriculture, forestry and fishing	0.056***	0.060***	0.060***	0.060***
	(0.010)	(0.010)	(0.010)	(0.010)
Electricity, gas, steam and air conditioning supply	0.148***	0.149***	0.149***	0.150***
	(0.046)	(0.046)	(0.046)	(0.046)
Professional, scientific and technical activities	-0.003	-0.003	-0.003	-0.003
	(0.008)	(0.008)	(0.008)	(0.008)
Owner(s) TI within ±€500 of any PIT kink	0.006	0.006	0.006	0.006
	(0.008)	(0.008)	(0.008)	(0.008)
Owner(s) TI within ±€500 of any PIT kink $t*2$	0.012**	0.012**	0.013**	0.013**
	(0.005)	(0.005)	(0.005)	(0.005)
Observations	49,750	49,750	49,750	49,750
Year dummies	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes
Additional control variables	yes	yes	yes	yes
Baseline probability	0.119	0.119	0.119	0.119

Notes: The table reports results obtained by estimating equation 5 for all owner-managed firms observed over 2009–2018 and reporting corporate taxable income within ±€25,000 of the kink. The dependent variable is a dummy that equals one if firms report corporate taxable income within the bunching window defined as of figure 1. Column 1 includes indicators for the repeated use of deductions, columns 2–4 investigate repeated EEID use by including an indicator for consecutive EEID use, EEID use followed by PID or both. Standard errors are clustered at the firm level. The table reports only a selection of the control variables, see table A9 in the appendix.

from zero after accounting for the use of EEID in t and PID in $t+1$. As discussed in the previous sections, investments also give rise to depreciation opportunities – which can be large for qualifying environmental assets. We find that firms with large depreciation as share of previous year's total assets are about 2.5 pp more likely to locate near the kink.

In addition, table 4 shows that the likelihood of locating at the kink is increasing in firms' size, as measured in terms of employees. It also indicates that, besides firms in

AFF, firms operating in the energy sector.[37] Finally, the table shows that firms for which there is at least one owners who repeatedly reports personal taxable income within €500 of any of the PIT kinks created by the progressive PIT schedule are 1.2 pp more likely to declare corporate taxable income near the CIT threshold.

5.6 Persistence in firms' responsiveness

Table 5 – *Bunching at the €200,000 threshold: Persistence in firms' responsiveness*

	(1)	(2)	(3)	(4)
EEID in t	0.003**	0.004**	0.008***	0.004**
	(0.002)	(0.002)	(0.002)	(0.002)
PID in t	0.005	0.005	0.005	0.005
	(0.003)	(0.003)	(0.003)	(0.003)
EEID $t*2$	0.011***			
	(0.002)			
PID $t*2$	0.001	0.004	0.004	0.003
	(0.004)	(0.005)	(0.005)	(0.005)
EEID in t and $t-1$ or $t+1$		0.010***		0.009***
		(0.003)		(0.003)
EEID in t and PID in $t+1$ (no SID in t)			0.014**	0.011
			(0.007)	(0.007)
Depreciation p75-p100	0.011***	0.012***	0.012***	0.012***
	(0.002)	(0.002)	(0.002)	(0.002)
Assets p50-p75	0.002	0.003*	0.003*	0.003*
	(0.001)	(0.001)	(0.001)	(0.001)
Assets p75-p90	0.006***	0.006***	0.006***	0.006***
	(0.002)	(0.002)	(0.002)	(0.002)
Assets p90-p100	0.007***	0.007***	0.008***	0.007***
	(0.002)	(0.002)	(0.002)	(0.002)
Employees p50-p75	0.002	0.002	0.002	0.002
	(0.002)	(0.002)	(0.002)	(0.002)
Employees p75-p90	0.000	0.001	0.000	0.001
	(0.002)	(0.002)	(0.002)	(0.002)
Employees p90-p100	0.008***	0.008***	0.008***	0.008***
	(0.002)	(0.002)	(0.002)	(0.002)
Agriculture, forestry and fishing	0.017***	0.018***	0.019***	0.018***
	(0.004)	(0.004)	(0.004)	(0.004)
Professional, scientific and technical	0.011***	0.011***	0.011***	0.011***
	(0.004)	(0.004)	(0.004)	(0.004)
Electricity, gas, steam and air conditioning	0.031***	0.031***	0.031***	0.031***
	(0.008)	(0.008)	(0.008)	(0.008)
Owner(s) TI within ±€500 of any PIT kink	0.004**	0.004**	0.004**	0.004**
	(0.002)	(0.002)	(0.002)	(0.002)
Owner(s) TI within ±€500 of any PIT kink $t*2$	0.007***	0.007***	0.007***	0.007***
Observations	49,300	49,300	49,300	49,300
Year dummies	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes
Additional control variables	yes	yes	yes	yes
Baseline probability	0.096	0.096	0.096	0.096

Notes: The table reports results obtained by estimating equation 5 for all owner-managed firms observed over 2009–2018 declaring taxable income within €25,000 of the kink. The dependent variable is a dummy that equals one if firms report corporate taxable income within the bunching window defined as of figure 1 in year t and if corporate taxable income in any other year is within ±€500 of corporate taxable income declared in t. Column 1 includes indicators for the repeated use of deductions, columns 2–4 investigate repeated EEID use by including an indicator for consecutive EEID use, EEID use followed by PID or both. Standard errors are clustered at the firm level. The table reports only a selection of the control variables, see table A11 in the appendix.

[37]The latter represent a very small fraction of the sample ("Other industries" in tables A1 and A2).

In this section, we study the role of characteristics and of the use of deductions for firms persistently locating near the kink. We conduct the same analysis as in the previous section but replace the dependent variable with an indicator that equals one if the company declares taxable income within a range $[\delta^-, \delta^+]$ of the kink in year t – set to reflect the bunching window of figure 2 – and within ±€500 of year t taxable income in any other year.[38] Table 5 reports results for selected variables and shows that firms repeatedly reporting corporate taxable income near the kink use EEID in the year in which they bunch and repeatedly over time. Consistent with intertemporal income shifting of tax deductions, persistence seems to be explained by EEID use in consecutive years.

In addition, we find that firms with large depreciation as share of previous year's total assets are more likely to persistently locate at the CIT kink. Firms in AFF and energy sectors remain relevant in explaining persistence. Additionally, we find a statistically significant effect for firms in human capital-intensive professional, scientific and technical activities. Moreover, the likelihood of persistently targeting the kink is increasing in firms' size, as measured by firms' assets and employees. The last two rows of table 5 show that firms for which there is at least one owner-manager who declares personal taxable income near any PIT kink in a given year and repeatedly over time (two times or more) are also more likely to persistently declare corporate taxable income at the CIT kink. Overall, this suggests that some firm-owners optimize repeatedly along multiple tax schedules.

6 Conclusions

We study the responsiveness of Dutch owner-managed companies to a change in the marginal corporate tax rate at the €200,000 kink. We use corporate tax return data over 2009-2018 and bunching techniques to infer the elasticity of corporate taxable income. We find an overall CETI of 0.08, which implies that for the 5 pp difference in tax rates at the kink, reported taxable income is reduced by 0.5 percent.

We investigate how firms can reduce corporate taxable income and estimate the responsiveness of firms using tax deductions – namely different types of investment deductions and loss carry-forwards. We find that firms using deductions for investments in energy efficient and environmentally friendly assets are highly responsive to the kink, with a CETI over three times larger than the baseline. Compared to other deductions, EEID are more generous, give rise to larger depreciation and include assets that can reflect owner-managers' consumption. Besides deductions, investments give rise to depreciation opportunities – which are larger for qualifying environmentally friendly assets. We find that firms with large depreciation are more responsive to the kink, and that the CETI is

[38] Table A12 shows that results are robust to different model and sample and range specification, to the use of a balanced panel of firms over 2009–2018, and to alternative definitions of the dependent variable.

even higher for firms with large depreciation and using EEID.

Elasticities are larger for firms using EEID repeatedly over time (CETI=0.16–0.54), and the CETI increases with the intensity of EEID use. We show that this is consistent with intertemporal income shifting of deductions across fiscal years, as firms spread investments and the related deductions across consecutive fiscal years or use tax provisions to shift part of the deduction to later years. This translates into a spike in the intensity of EEID use for firms reporting corporate taxable income at the kink. However, we find no evidence that higher deduction intensity translates into stronger firm growth.

We show that the intensive EEID use by firms at the kink relates to MTR changes at the kink. First, we find no evidence of intensive EEID use for companies declaring taxable income at €200,000 in years when there is no MTR change around this sum. Second, we investigate EEID use by unincorporated firms, whose taxable income is not subject to CIT but allocated to the owners and taxed under the PIT schedule. We find evidence of EEID use for unincorporated firms with taxable income around PIT kinks but not for those with taxable income near €200,000. We show that firms reporting taxable income at the kink achieve large tax savings thanks to the use of tax deductions – and in particular of EEID – and that tax deductions explain 46 percent of the baseline CETI.

Tax responsiveness can also vary with firms' characteristics. We find a CETI of 0.4 for firms operating in agriculture, forestry and fishing industries. We conjecture that higher responsiveness of firms in AFF may be partly due to an easier access to EEID. In line with this, we find a larger elasticity when restricting the sample further to firms in AFF using EEID repeatedly over time. In addition, we document responsiveness heterogeneity depending on firms' size and a positive monotonic relationship between the latter and the excess mass of firms at the kink. Crucially, we show that the sign of the relationship depends on the threshold at which the excess mass is measured.

Finally, we document persistence of firms at the kink and show that for these companies the CETI is 0.82. Persistent companies are large, use repeatedly EEID, and operate in AFF, energy and human capital-intensive industries, and are owned by entrepreneurs who (persistently) locate near personal taxable income thresholds. We find CETI estimates above the baseline for owner-managers targeting PIT kinks repeatedly and show that the personal elasticity of taxable income is larger for entrepreneurs with firms declaring corporate taxable income near the kink repeatedly over time. This suggests that some owner-managers plan their taxes aggressively along multiple tax schedules.

All in all, our results document the presence of substantial elasticity heterogeneity and show that the CETI can be ten times the baseline estimate for some taxpayers. This is consistent with a model where elastic taxpayers invest in tax knowledge and use deductions to reduce their tax burden (Agersnap and Bjørkheim, 2024). In this setting,

governments use tax complexity created by tax deductions to reduce distortions on responsive firms and improve efficiency, while extracting full tax revenues from companies that are less responsive to tax incentives.

Our results have at least two implications. First, they highlight the limits of using CETI estimates as sufficient statistics for welfare analysis in context where there are deduction possibilities, as they show that the type and design of deductions available in the tax system can exacerbate distortions. In this sense, bunching analyses can be generalized and used by tax administrations around the world to identify which features of the tax system generate large behavioral responses, and possibly increase revenue gains from tax enforcement at low costs. Second, our results point out to the presence of substantial frictions. In particular, frictions can reconcile the findings of a small baseline elasticity together with the larger response of firms with certain characteristics and persistence of firms and individuals at kinks.

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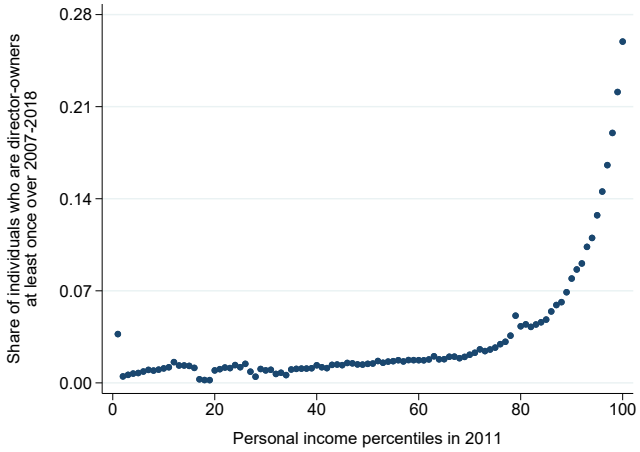
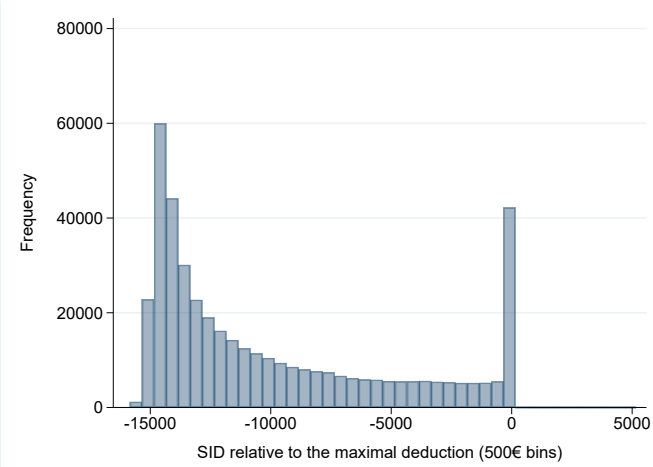
Appendix

Figure A1 – *Share of owner-managers by personal income percentiles*



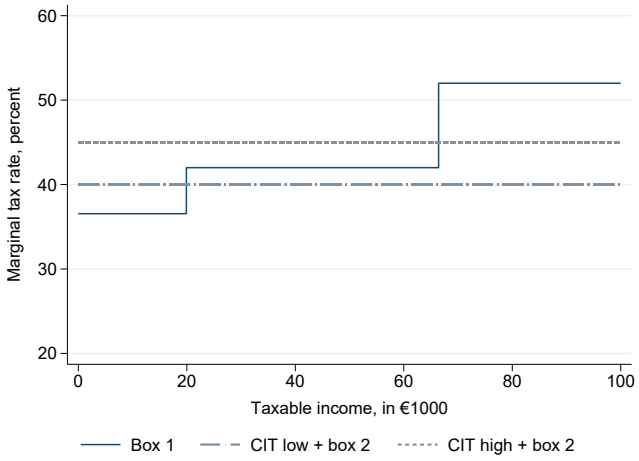
Notes: The x-axis shows 2011 personal income percentiles for the Dutch resident population. For each percentile, the y-axis shows the share of individuals who at any point in time over 2007–2018 are owner-managers of a corporation.

Figure A2 – *Small investment deductions over 2010–2018*



Notes: On the y-axis, the figure plots the frequency of SID relative to the distance to the maximal yearly SID, in €500 bins. The maximal yearly SID is marked at zero on the x-axis. The sample consists of owner-managed companies observed over 2010–2018.

Figure A3 – *Owner-managers' marginal tax rates as of 2016*



Notes: The figure plots marginal income tax rates faced by director owners in 2016 at different levels of income. Director owners can pay themselves a (CIT exempt) wage taxed at progressive rates at the personal level (box 1). Alternatively, after paying taxes on corporate taxable income they pay a $\tau_d = 25$ percent tax rate on dividend distributions (box 2). The marginal CIT rate τ_c is 20 percent below €200,000 of corporate taxable income and 25 percent above that. The combined CIT + box 2 rate is calculated as $\tau_c + (1 - \tau_c) * \tau_d$. See the Online Appendix for more details on the Dutch personal and corporate tax system.

Table A1 – *Industry composition, full sample*

Nace code	Description of activities	N	Share of firms	Assets, p50 (€1000)
K	Financial and insurance	607993	0.27	399.85
M	Professional, scientific and technical	570812	0.25	343.94
G	Wholesale and retail trade	291873	0.13	661.84
F	Construction	120635	0.05	485.87
Q	Human health and social work	92010	0.04	501.28
C	Manufacturing	91027	0.04	744.32
N	Administrative and support service	85991	0.04	370.77
J	Information and communication	81972	0.04	241.92
L	Real estate	68978	0.03	639.36
H	Transporting and storage	43904	0.02	738.04
I	Accommodation and food service	40363	0.02	499.45
A	Agriculture, forestry and fishing	37960	0.02	1279.04
R	Arts, entertainment and recreation	31232	0.01	405.75
P	Education	23477	0.01	258.95
S	Other services	19208	0.01	368.63
E	Water and waste management	2564	0.00	857.66
–	Other industries	1688	0.00	444.02
–	Missing	48400	0.02	353.33

Notes: The table reports Nace codes and the description of corresponding activities, as well as the number and share of firms in each industry for owner-managed firms over 2009–2018. For each industry, the last column reports median assets in 2015 thousand of euros.

Table A2 – *EEID, PID, assets' depreciation by industry for firms with taxable income near the kink*

	Taxable income within ±€25,000 of the kink					Taxable income within [−€4000,€500] of the kink				
	Share of firms	Assets, p50 (€1000)	EEID share	PID share	Depreciation, share of $t-1$ assets	Share of firms	Assets, p50 (€1000)	EEID share	PID share	Depreciation, share of $t-1$ total assets
Financial and insurance	0.17	2292.04	0.02	0.00	0.05	0.15	2373.77	0.03	0.01	0.09
Professional, scientific and technical	0.23	1216.26	0.02	0.00	0.02	0.22	1250.31	0.03	0.00	0.03
Wholesale and retail trade	0.17	1905.25	0.04	0.01	0.04	0.18	1964.03	0.05	0.01	0.05
Construction	0.05	1580.08	0.04	0.01	0.04	0.06	1661.14	0.05	0.01	0.05
Human health and social work	0.10	989.32	0.03	0.00	0.03	0.09	1010.38	0.04	0.01	0.03
Manufacturing	0.06	1965.52	0.05	0.01	0.05	0.06	2045.90	0.04	0.01	0.07
Administrative and support service	0.04	1451.67	0.03	0.00	0.04	0.03	1421.27	0.02	0.01	0.04
Information and communication	0.02	1023.99	0.03	0.00	0.25	0.02	1005.97	0.04	0.00	0.03
Real estate	0.04	2354.41	0.03	0.00	0.03	0.04	2036.74	0.05	0.01	0.05
Transporting and storage	0.02	2279.19	0.07	0.02	0.07	0.03	2696.47	0.12	0.01	0.09
Accommodation and food service	0.02	1423.24	0.06	0.01	0.06	0.02	1624.60	0.09	0.01	0.06
Agriculture, forestry and fishing	0.03	2571.92	0.13	0.04	0.08	0.06	3636.87	0.22	0.07	0.14
Arts, entertainment and recreation	0.01	1427.45	0.04	0.01	0.04	0.01	1413.74	0.05	0.02	0.05
Education	0.01	1031.82	0.02	0.00	0.04	0.01	947.75	0.00	0.00	0.05
Other services	0.01	1456.92	0.02	0.00	0.04	0.01	1173.17	0.02	0.00	0.04
Water and waste management	0.00	1824.57	0.04	0.01	0.06	0.00	3047.20	0.00	0.00	0.08
Other industries	0.00	1695.27	0.02	0.01	0.08	0.00	5251.52	0.05	0.02	0.19
Missing	0.02	1405.71	0.02	0.00	0.03	0.01	1239.39	0.03	0.00	0.03

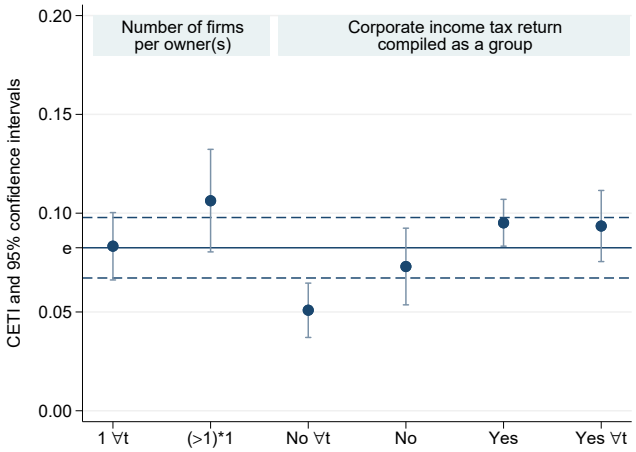
Notes: The table reports the share of firms in each Nace industry for the sample of owner-managed firms reporting taxable income within ±€25,000 of the kink (left panel) or within [−€4000,€500] of the kink (right panel). For firms with taxable income within these ranges in year t, we also report median assets in 2015 thousand of euros, the share of firms using EEID and PID, and the average depreciation in year t relative to $t-1$ total assets. The sample includes owner-managed firms over 2009–2018.

Table A3 – *Summary statistics for the matched sample: Owner-managers and their firms*

	Full sample				Corporate taxable income near the kink			
	Mean	p10	p50	p90	Mean	p10	p50	p90
Firm-level variables								
Number of director-owners	1.18	1.00	1.00	2.00	1.26	1.00	1.00	2.00
Number of years observed	6.25	2.00	6.00	10.00	7.90	3.00	10.00	10.00
Age	10.41	1.50	7.50	21.50	12.39	3.00	10.00	23.50
Number of employees	6.99	0.67	1.90	14.33	10.94	1.00	4.00	25.00
Total assets	1074.90	54.22	381.51	2476.55	2422.41	421.43	1449.95	5408.61
Fixed assets	251.36	0.00	17.82	610.00	587.34	1.95	118.38	1588.37
Intangible assets	8.62	0.00	0.00	10.00	15.71	0.00	0.00	29.50
Equity	532.35	-47.63	136.39	1349.76	1395.68	139.01	735.62	3264.29
Turnover	952.14	42.53	190.89	2048.95	1989.25	189.45	733.82	4826.74
Depreciation	28.04	0.00	5.20	61.66	61.75	0.65	19.91	157.46
Goods and materials costs	620.34	3.60	47.79	1310.72	1305.58	11.31	284.62	3425.44
Wage and pension costs	230.04	21.90	85.85	503.27	427.53	65.67	193.84	994.19
Operating result	59.74	-24.81	16.48	168.06	165.20	15.45	137.95	320.79
Net profits	82.62	-26.59	24.04	230.04	228.64	37.34	165.67	444.99
+ director-owners' wage	143.57	2.60	81.87	323.84	317.76	99.07	252.85	564.39
Investment balance	6.06	0.85	4.12	13.09	8.05	1.11	6.39	14.76
LCF	32.21	0.93	10.53	77.36	72.28	2.35	31.22	178.11
Corporate taxable income	46.84	-26.07	12.70	147.82	152.92	24.89	136.69	290.67
Number of firms	279,889				28,541			
Owner-level variables								
Number of firms	1.02	1.00	1.00	1.00	1.03	1.00	1.00	1.10
Number of years observed	6.39	2.00	7.00	10.00	8.02	3.00	10.00	10.00
Personal taxable income	54.12	17.55	48.27	94.59	72.48	28.34	63.25	125.74
Director-owner wage	50.34	11.18	45.23	93.76	70.45	20.68	63.75	126.55
Dividend income	112.18	2.82	50.11	255.54	162.95	12.85	98.07	350.74
Age	49.87	36.00	49.50	64.00	51.09	38.50	50.50	64.00
Gender (M)	0.76	0.00	1.00	1.00	0.76	0.00	1.00	1.00
Number of director-owners	327,292				42,204			

Notes: The table reports summary statistics for selected variables over the period 2009–2018, at the firm (top panel) and individual level (bottom panel). The table focuses on the matched sample of firms, i.e. those firms for which additional data from the balance sheet and the profit and loss statement is observed. Data is averaged over time by company in the top panel and by individual in the bottom panel. Monetary values are expressed in 2015 thousand of euros and winsorized at the 1 percent and 99 percent level after computing firm- and individual-level averages. Summary statistics are provided for the full sample (left panel) and for firms that at any point in time report taxable income within ±€25,000 of the €200,000 corporate tax kink (top right panel). The bottom right panel describes director-owners of companies that at any point in time report corporate taxable income within ±€25,000 of the kink. Negative values are in parenthesis.

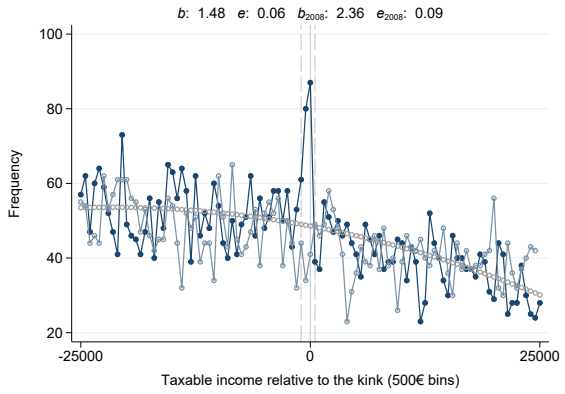
Figure A4 – *Bunching at the €200,000 threshold: Extensive margin response*



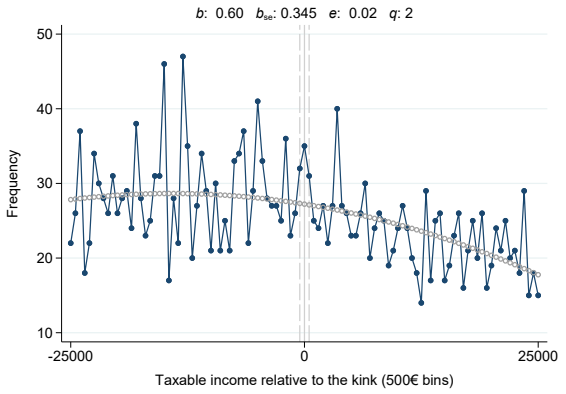
Notes: The figure displays CETI estimates obtained restricting the baseline sample to specific characteristics. The blue dots show the estimated CETI and the range around it the 95 percent confidence intervals. The horizontal lines represent the baseline CETI of figure 1 and its 95 percent confidence interval. The first two estimates report the CETI for firms where there is at most one director-owner in each year the firm is observed ($1\ \forall t$) or to firms where there is at least one entrepreneur who is director-owner of more than one firm in any of the years in which the firm is observed ($(>1)*t$). The next four estimates report the CETI obtained for firms compiling the CIT return as a group in year t (yes/no) or in every year in which they are observed (yes/no $\forall t$). Results are for the pooled sample of owner-managed companies over 2009–2018. The bunching window is derived using Bosch et al. (2020)'s data driven procedure, the polynomial order is chosen using the BIC, the estimation range includes firms declaring taxable income within ±€25,000 of the kink and the bin width is €500.

Figure A5 – *Alternative counterfactual and kinks*

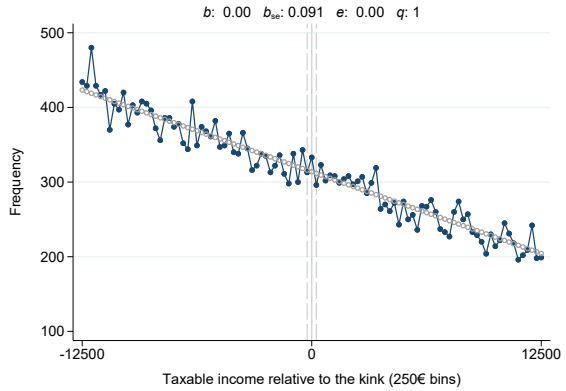
(a) *€200,000 threshold: 2008 vs. 2009*



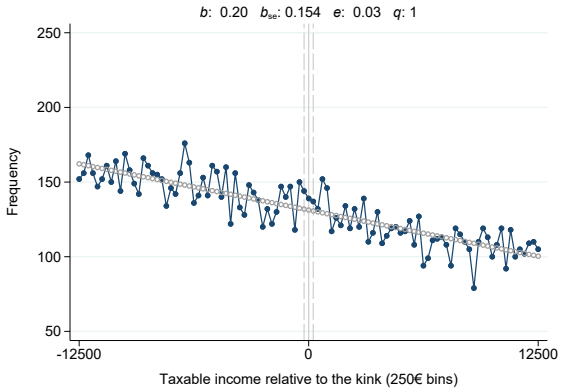
(b) *€275,000 threshold in 2008*



(c) *€25,000 threshold in 2007*



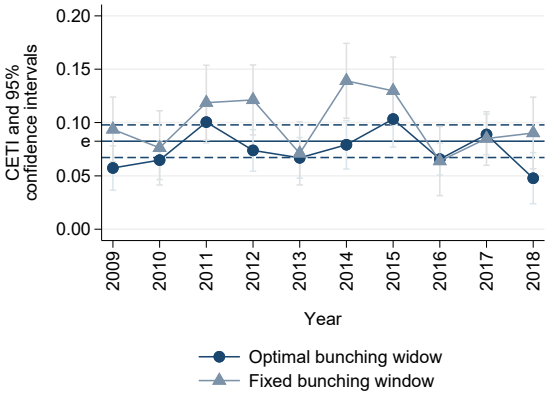
(d) *€60,000 threshold in 2007*



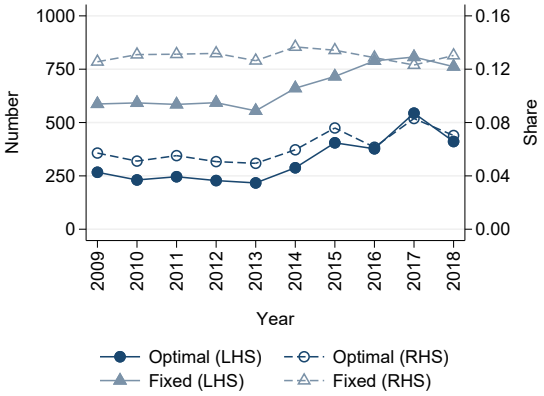
Notes: Figure (a) plots taxable income bins in 2009 relative to the distance to the threshold on the x-axis and the frequency of firms in each bin on the y-axis (solid dots). The hollow light blue dots show the inflation adjusted 2008 taxable income distribution. Both distributions are normalized by the €200,000 kink, marked by the solid vertical line at zero. The vertical dashed lines represent the bunching window, as estimated by Bosch et al. (2020)'s data driven procedure. The hollow dotted line represents the counterfactual density estimated by polynomial regression. b and e are the excess mass and elasticity obtained using the polynomial regression to estimate the counterfactual density. b_{2008} is the excess mass obtained when using the 2008 counterfactual and e_{2008} the related elasticity. Figure (b) plots the distribution of firms in 2008 around the €275,000 kink, where the tax rate changed by 5.5 pp. Figure (c) plots the distribution of firms in 2007 around the €25,000 kink, where the marginal CIT rate changed by 3.5 pp. Figure (d) plots the distribution of firms in 2007 around the €60,000 kink, where the tax rate changed by 2 pp. In figures (c)–(d) we consider firms reporting taxable income within ±€12,500 of the kink to avoid overlap between the two figures and select a bin width of €250, whereas in figures (a)–(b) we use the baseline ±€25,000 and w = €500 as in figure 1. In all figures, the bunching window is derived using Bosch et al. (2020)'s data driven procedure and the polynomial order is chosen using the BIC.

Figure A6 – *Bunching at €200,000 threshold: Evolution over time*

(a) *CETI over 2009–2018*

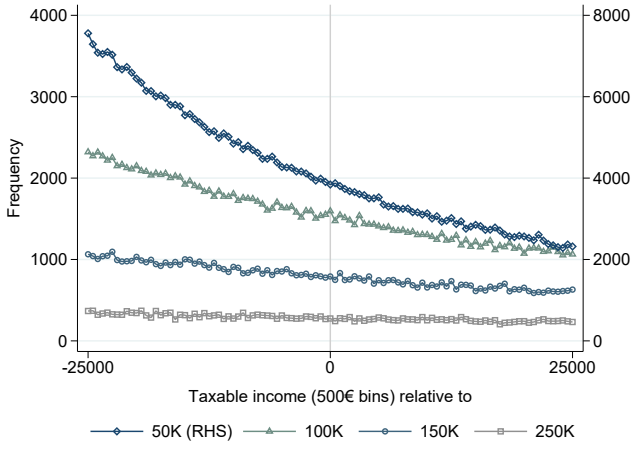


(b) *Firms in the bunching window*



Notes: Figure (a) shows yearly CETI estimates and their 95 percent confidence intervals over 2009–2018. We plot results obtained for a fixed bunching window reflecting that of the baseline result in figure 1 and for the optimal bunching windows obtained for each estimate using Bosch et al. (2020)'s data driven procedure. The horizontal constant lines represent the baseline CETI of figure 1 with its 95 percent confidence interval. We consider firms declaring taxable income within ±€25,000 of the kink, use a €500 bin width and select the polynomial order for each estimate using the BIC. Figure (b) plots the yearly number of firms in the bunching window (solid lines) over 2009–2018 as well as what share of firms with taxable income within ±€25,000 of the kink they represent (dashed lines). This is done using a fixed window reflecting that of figure 1 and the optimal bunching windows obtained using Bosch et al. (2020)'s optimal data driven procedure.

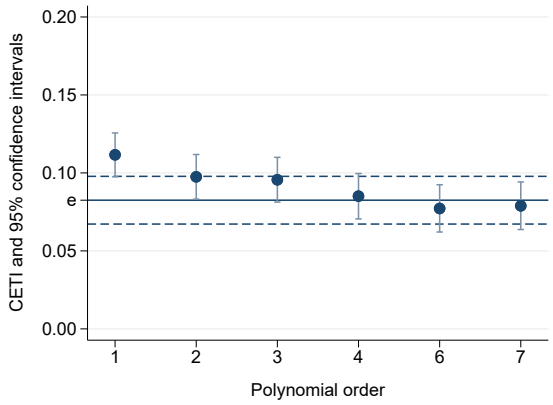
Figure A7 – *Bunching at other taxable income levels*



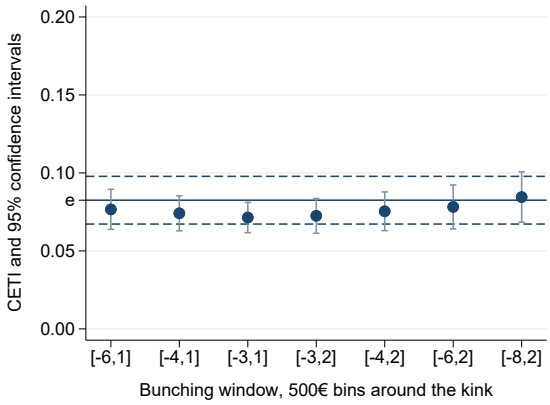
Notes: The figure plots €500 taxable income bins relative to a ±€25,000 distance to different thresholds on the x-axis, and the frequency of firms in each bin on the y-axis. We consider firms reporting taxable income around €50,000 (right hand side), €100,000, €150,000 and €250,000 respectively (left hand side). The taxable income distribution is normalized by the kinks, and marked by the solid vertical line at zero. The sample consists of owner-managed companies over 2009–2018.

Figure A8 – *Bunching at the €200,000 threshold: Robustness*

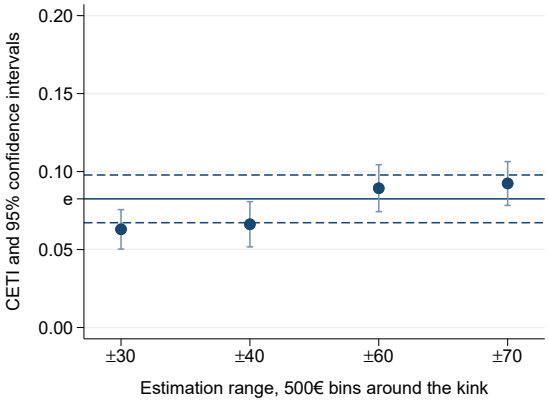
(a) *Polynomial order*



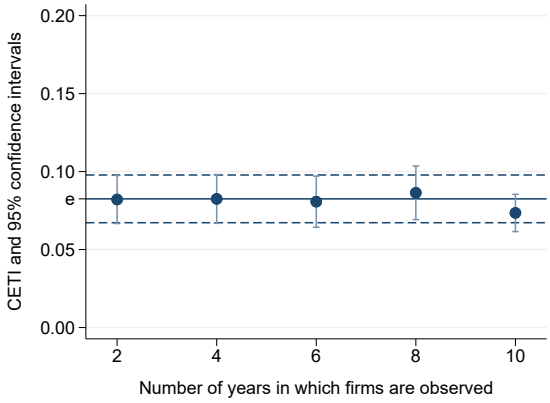
(b) *Bunching window*



(c) *Range around the threshold*



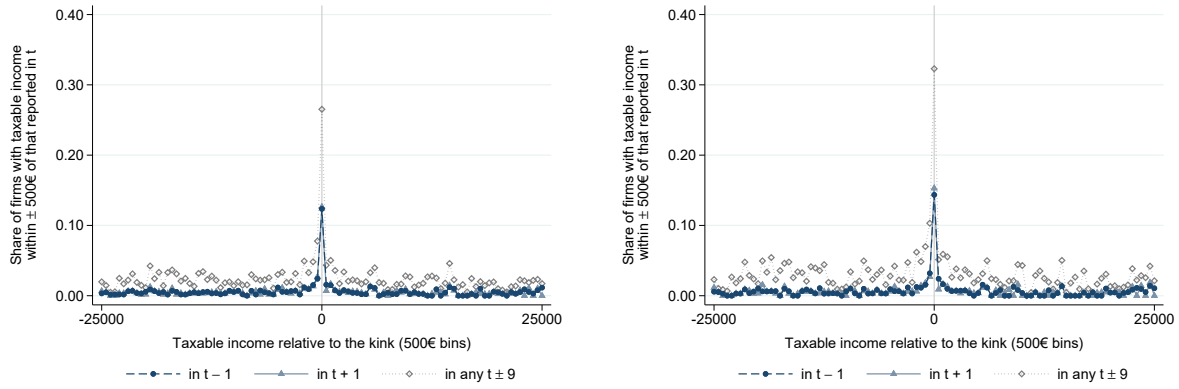
(d) *Number of years firms are observed*



Notes: The figure plots elasticity estimates obtained for the baseline sample of figure 1 when varying (a) the polynomial order, (b) the bunching window, (c) the range of observations around the kink and (d) the number of years firms are observed. The x-axis in figures (c) and (d) is expressed in €500 bins. The blue dot represents the estimated elasticity and the range around it the 95 percent confidence interval. The horizontal lines represent the baseline CETI reported in figure 1 and its 95 percent confidence interval. Results are for the pooled sample of owner-managed firms over 2009–2018. Unless otherwise specified, the bunching window is derived using Bosch et al. (2020)'s data driven procedure, the polynomial order is chosen using the BIC and the estimation range is of ±€25,000 i.e. 50 bins of €500 around the kink. In all figures, the bin width is €500.

Figure A9 – *Bunching at the €200,000 threshold: Share of persistent firms*

(a) *Full sample* (b) *Balanced sample*



Notes: The figure plots taxable income bins relative to the distance to the threshold on the x-axis. The y-axis displays the share of firms each taxable income bin that in year $t-1$, $t+1$ or in any other year locate within ±€500 of taxable income declared in year t. The taxable income distribution is normalized by the kink, marked by the solid vertical line at zero. The sample consists of owner-managed companies over 2009–2018. Figure (a) considers all firms whereas figure (b) only those that are observed every year over 2009–2018.

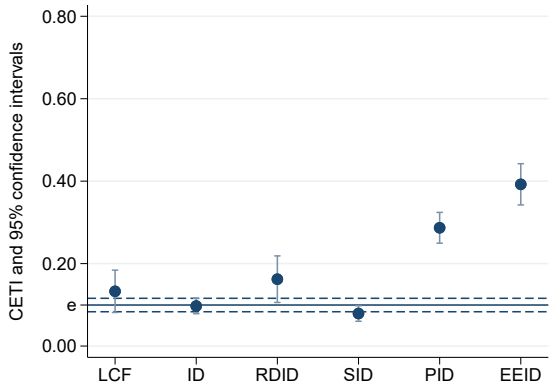
Table A4 – *Bunching at the €200,000 threshold: Use of deductions*

Sample	b	b_{se}	e	CI−	CI+	Δ TI, %	N	q	δ^-	δ^+	N $[\delta^-, \delta^+]$
Baseline sample	2.13	0.20	0.08	0.07	0.10	0.53	51242	5	-8	1	6647
Matched sample	2.56	0.22	0.10	0.08	0.12	0.64	39428	5	-8	2	5688
Use of tax deductions											
LCF in t	2.76	0.36	0.11	0.08	0.13	0.69	2141	3	-1	1	130
ID in t	2.35	0.20	0.09	0.08	0.11	0.59	22916	5	-4	1	2042
RD $t*1$	2.75	0.49	0.11	0.07	0.14	0.69	1716	1	-1	1	97
SID in t	1.99	0.20	0.08	0.06	0.09	0.50	22092	5	-4	1	1876
PID t*1	7.42	0.51	0.29	0.25	0.33	1.86	2108	1	-2	1	241
EEID in t	8.27	0.66	0.32	0.27	0.37	2.07	1797	1	-2	1	222
SID t*1	2.11	0.16	0.08	0.07	0.09	0.53	37231	5	-5	1	3616
SID $t*2$	2.37	0.19	0.09	0.08	0.11	0.59	30481	5	-5	2	3344
SID $t*3$	2.38	0.21	0.09	0.08	0.11	0.59	25490	4	-6	1	2789
SID in t (no EEID in t) & PID in $t+1$	2.93	0.67	0.11	0.06	0.16	0.73	626	1	-1	1	37
SID in t & SID in $t \pm 1$	2.56	0.26	0.10	0.08	0.12	0.64	18389	3	-7	1	2207
EEID $t*1$	4.80	0.28	0.19	0.16	0.21	1.20	10191	2	-3	1	1038
EEID $t*2$	6.89	0.60	0.27	0.22	0.31	1.72	3096	7	-3	1	426
EEID $t*3$	9.13	1.11	0.35	0.27	0.44	2.28	1044	7	-2	1	166
EEID in t & PID in $t+1$	9.49	1.13	0.37	0.28	0.45	2.37	629	7	-1	1	107
EEID in t & EEID in $t \pm 1$	13.89	1.20	0.54	0.45	0.63	3.47	503	1	-2	1	90
Use of accounting deductions											
Δ total provisions p75-p100 in t	1.59	0.24	0.06	0.04	0.08	0.40	8167	7	-2	1	476
Δ pension provisions p75-p100 in t	1.69	0.23	0.07	0.05	0.08	0.42	6633	1	-1	1	307
Δ other provisions p75-p100 in t	2.82	0.28	0.11	0.09	0.13	0.70	3640	2	-2	1	258
Wage costs p75-p100 in t	2.71	0.22	0.10	0.09	0.12	0.68	9079	1	-3	1	695
Goods and materials costs p75-p100 in t	2.91	0.29	0.11	0.09	0.14	0.73	9053	7	-4	1	846
Depreciation p75-p100 in t	6.01	0.29	0.23	0.21	0.26	1.50	7859	1	-3	1	865
Depreciation p75-p100 in t & EEID $t*1$	12.17	0.60	0.47	0.43	0.52	3.04	2281	1	-3	1	395

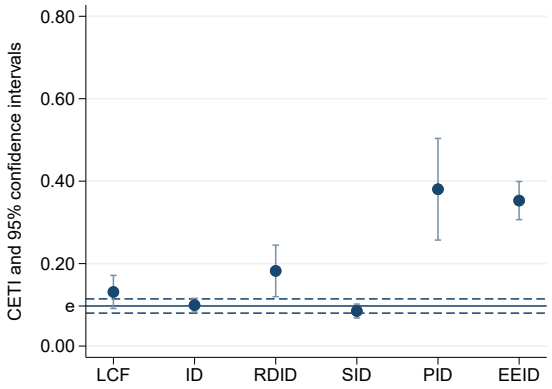
Notes: The table reports CETI estimates for different subgroups of owner-managed companies using tax and accounting deductions over 2009–2018. $t*i,\ i=1,2,3$ indicates firms using a tax deduction at least once, twice or three times over the time period they are observed. t & $t \pm 1$ marks firms using EEID or SID in year t as well as in $t+1$ or $t-1$. t & PID $t+1$ marks firms that at any point in time use EEID or SID in year t and PID in $t+1$. For SID, we require that no EEID is used in t. The bottom panel considers firms accounting variables, namely: (i) the yearly change in provisions (consisting of pension and other provisions); (ii) yearly costs for wages, salaries and social security contributions; (iii) yearly costs for raw materials, consumables and other operating costs; (iv) yearly depreciation. For each accounting variable x, p75–p100 indicates firms with corporate taxable income within ±€25,000 of the kink that in year t report x expressed as a share of $t-1$ total assets, within the top p75–p100. b is the relative excess mass and b_{se} its standard error. e is the CETI and CI− and CI+ are its 95 percent confidence intervals. Δ TI is the percent change in corporate taxable income implied by the CETI for a 5 pp increase in the MTR at the kink. N represents the number of observations in the estimation range, i.e. those firms declaring corporate taxable income within ±€25,000 of the kink. q is the polynomial order, determined using the BIC. $[\delta^-, \delta^+]$ represent the lower and upper bounds of the bunching window – determined using Bosch et al. (2020)'s data driven procedure – and N $[\delta^-, \delta^+]$ reports the number of observations it contains. The bin width used for all estimates is of €500.

Figure A10 – *Bunching at the €200,000 threshold: Use of tax deductions*

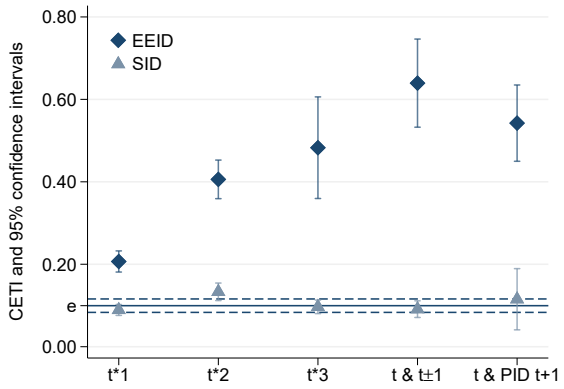
(a) *Full sample, use of deductions in t*



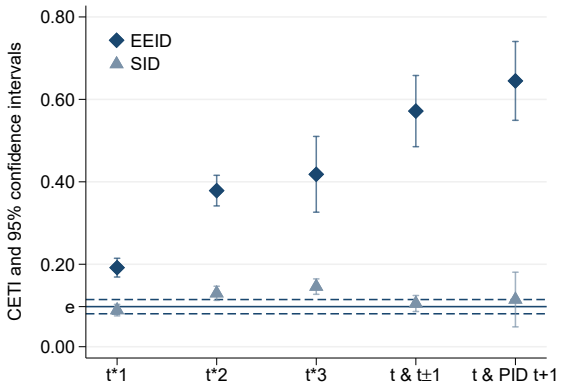
(b) *Balanced sample, use of deductions in t*



(c) *Full sample, repeated use of deductions*



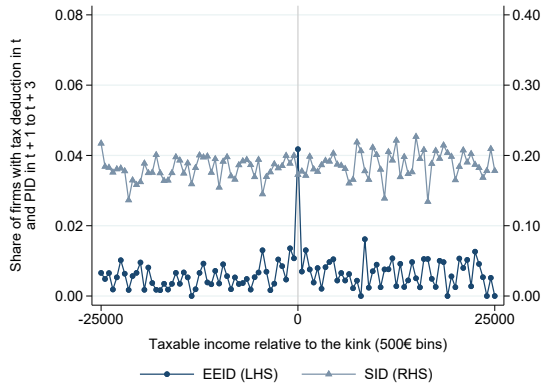
(d) *Balanced sample, repeated use of deductions*



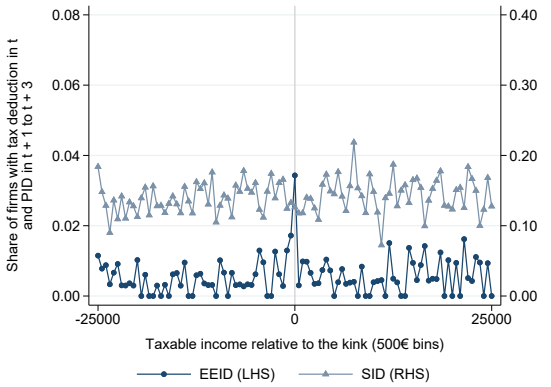
Notes: The figures plot CETI estimates for different subgroups of owner-managed companies using tax deductions over 2009–2018 and declaring corporate taxable income in year t within ±€25,000 of the kink. The horizontal lines represent the baseline elasticity of figure 1 and its 95 percent confidence interval. In figure (a) the blue dots represent the estimated CETI for firms that use tax deductions in year t and the range around it is the 95 percent confidence interval. ID includes all investment deductions, i.e. RDID, SID, EEID and PID. Figure (b) reports results as in (a) but using a balanced sample of firms observed every year over 2009–2018. Figure (c) displays the CETI for firms using repeatedly EEID or SID. The first three estimates report the CETI for firms using EEID (SID) at least once, twice or three times over the time period the firm is observed ($t * i,\ i = 1, 2, 3$). t & $t \pm 1$ shows results for firms that use EEID or SID in year t as well as in $t+1$ or $t-1$. t & PID $t+1$ for firms that at any point in time use EEID or SID in year t and PID in $t+1$. For SID, we require that no EEID is used in t. Figure (d) reports results as in (c) but using a balanced sample of firms observed every year over 2009–2018. In all figures the bunching window is determined using Bosch et al. (2020)'s data driven procedure and q using the BIC, and a bin width of €1,000.

Figure A11 – *Shifting deductions across fiscal years: Use of deductions and PID*

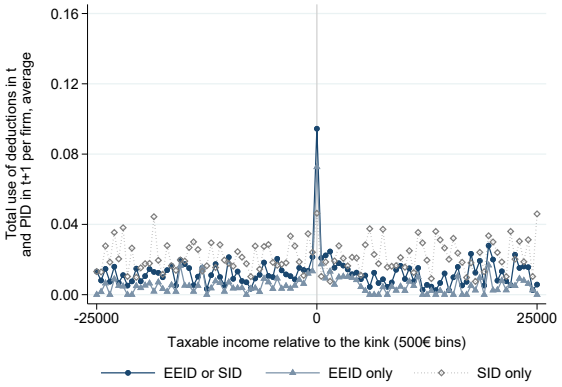
(a) *Full sample: Share of users*



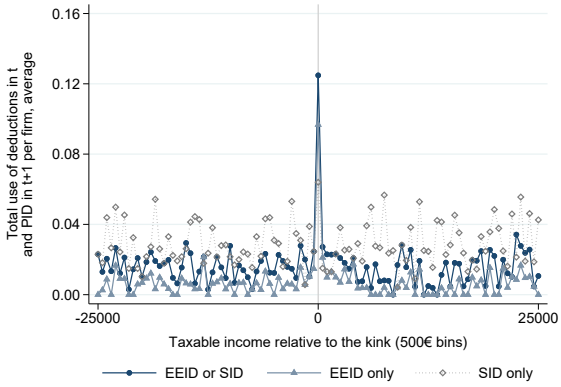
(b) *Balanced sample: Share of users*



(c) *Full sample: Total use*



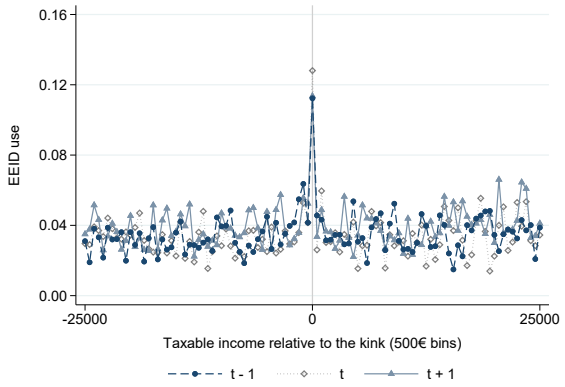
(d) *Balanced sample: Total use*



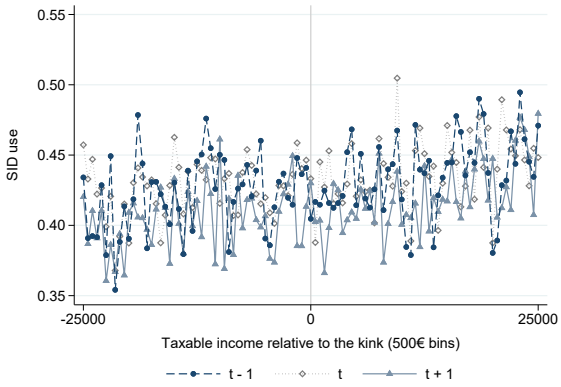
Notes: The figures describe the use of deductions and PID for owner-managed firms reporting corporate taxable income within ±€25,000 of the kink over 2009–2018. Figures (a) and (c) consider all firms observed over 2009–2018 whereas figures (b) and (d) focus on firms observed every year over the sample period. Figures (a) and (b) show the share of firms using EEID (SID) but no SID (EEID) in year t and PID in any of the following $t+1$, $t+2$ or $t+3$ years. Figures (c) and (d) calculate the total number of times a firm uses tax deductions in year t and PID in year $t+1$ over the time period the company is observed. This is reported separately for firms that in year t use (i) either EEID or SID, (ii) SID only and (iii) EEID only. For each of these measures, the y-axis reports average total use per firm in each €500 taxable income bin.

Figure A12 – *Shifting of income across fiscal years: Consecutive use of deductions*

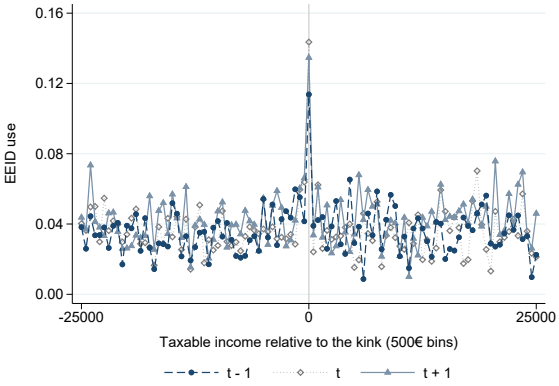
(a) *Full sample, EEID*



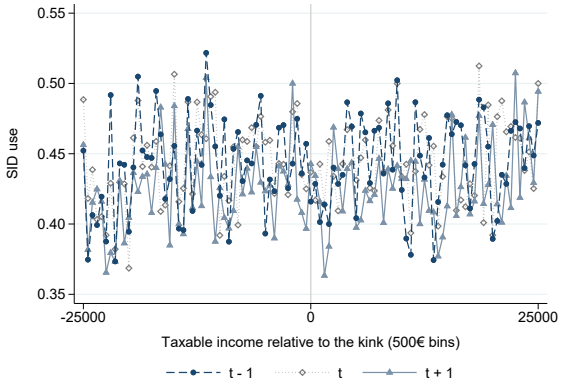
(b) *Full sample, SID*



(c) *Balanced sample, EEID*



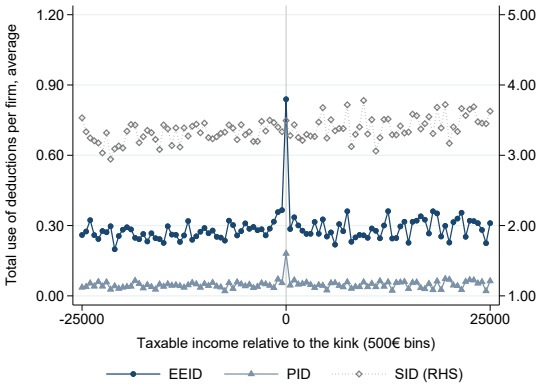
(d) *Balanced sample, SID*



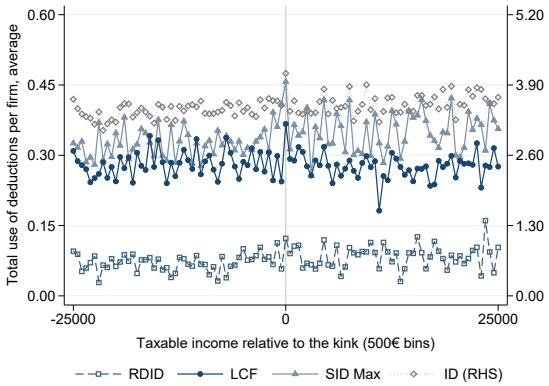
Notes: The figures describe the consecutive use of SID and EEID by owner-managed firms over 2009–2018. The figures plot €500 taxable income bins relative to a distance of ±€25,000 to the threshold on the x-axis. Figures (a) and (b) are consider all firms observed over 2009–2018 whereas figures (c)–(d) focus on firms observed every year over this period. Figures (a) and (c) plot the share of firms in each taxable income bin using EEID in year t and the share of firms in each taxable income bin using EEID in $t-1$ and $t+1$ respectively. Figures (b) and (d) show results for SID.

Figure A13 – *Bunching at the €200,000 threshold: Total use of deductions per firm*

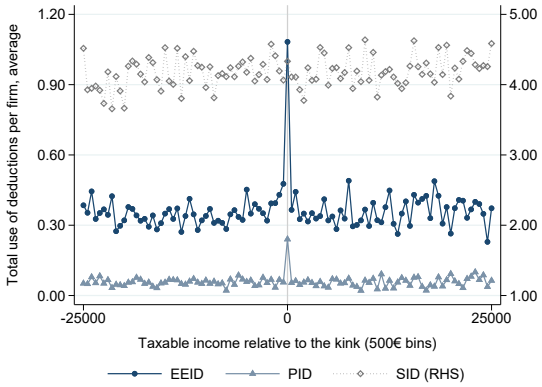
(a) *Full sample: EEID, PID and SID*



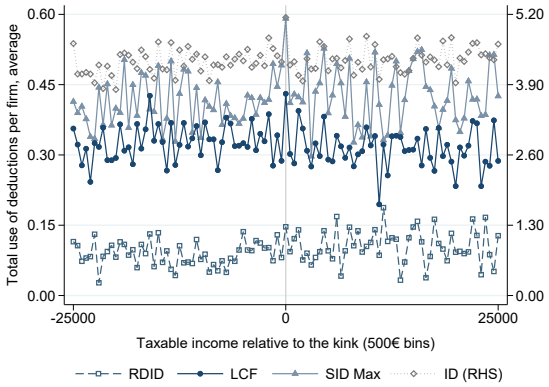
(b) *Full sample: Other deductions*



(c) *Balanced sample: EEID, PID and SID*



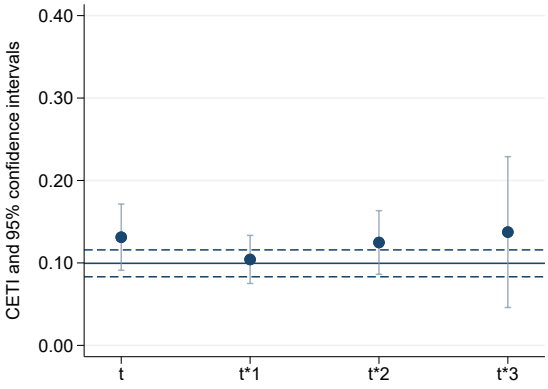
(d) *Balanced sample: Other deductions*



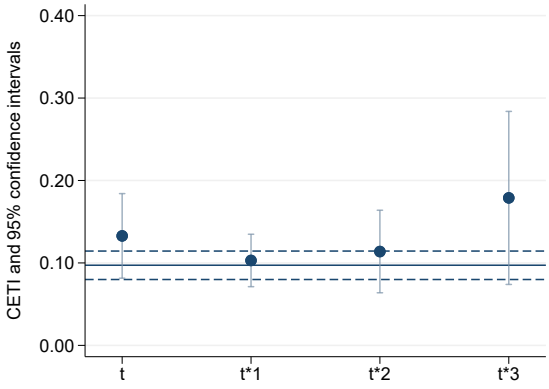
Notes: The figures describe total use of tax deductions per firm over time for owner managed firms reporting corporate taxable income within ±€25,000 of the kink over 2009–2018. Figures (a) and (c) consider all owner-managed firms observed over 2009–2018 whereas figures (b)–(d) focus on firms observed every year over this period. Figures (a) and (b) calculate the total number of times a firm uses EEID, SID or PID over the time period the company is observed. It then averages these measures for each €500 corporate taxable income bin around the kink. Figures (c) and (d) do this for all ID (comprising SID, EEID, PID and RDID), RDID, LCF and the maximal SID (SID Max).

Figure A14 – *Bunching at the €200,000 threshold: Repeated use of other tax deductions*

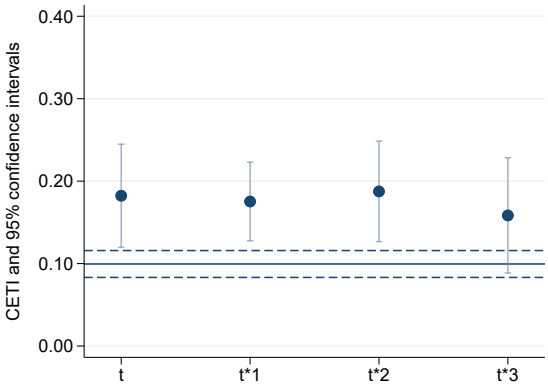
(a) *LCF, full sample*



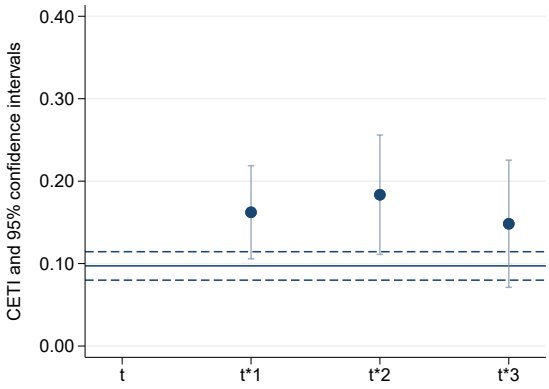
(b) *LCF, balanced sample*



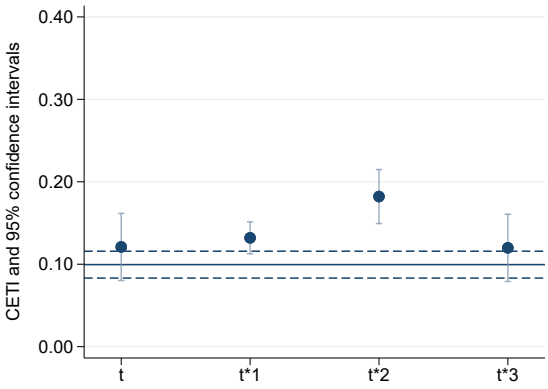
(c) *RDID, full sample*



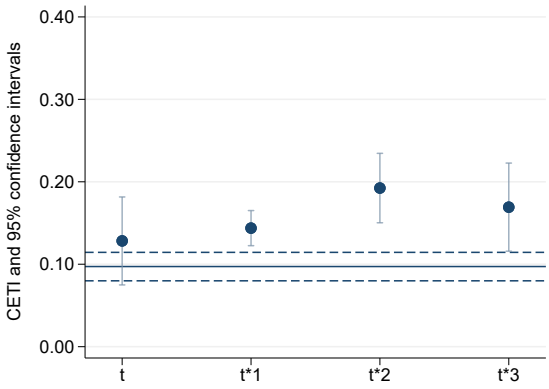
(d) *RDID, balanced sample*



(e) *Maximal SID, full sample*



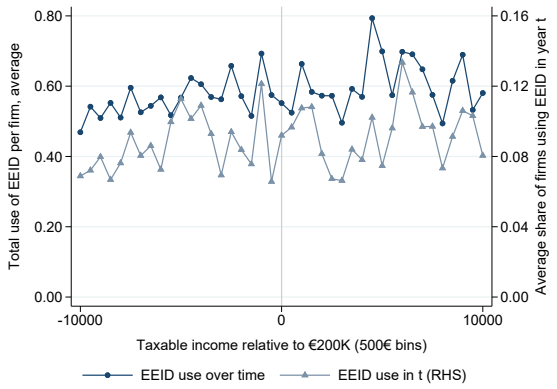
(f) *Maximal SID, balanced sample*



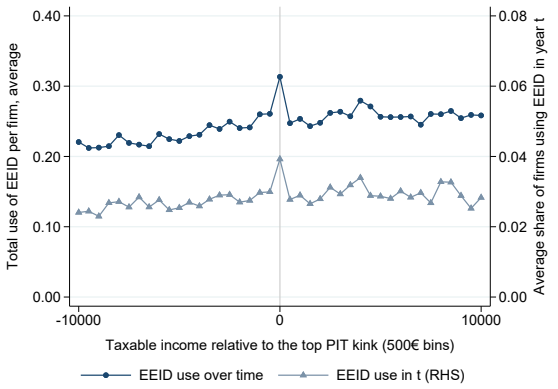
Notes: The horizontal lines represent the baseline CETI of figure 1 and its confidence interval. t shows the CETI for firms using the tax deduction in year t whereas $t * i$, $i = 1, 2, 3$ report the CETI for firms using deductions at least once, twice or three times over time. We cannot compute the CETI for firms with RDID in t due to observational requirements. The bunching window is determined using Bosch et al. (2020)'s data driven procedure and q using the BIC. The bin width is €1,000. Figures (a), (c) and (e) refer to the full sample of owner-managed firms with corporate taxable income within ± 25,000 of the kink over 2009–2018 whereas figures (b), (d) and (f) focus on a balanced panel of firms.

Figure A15 – *Use of EEID and bunching: Unincorporated firms*

(a) *Bunching at €200,000*



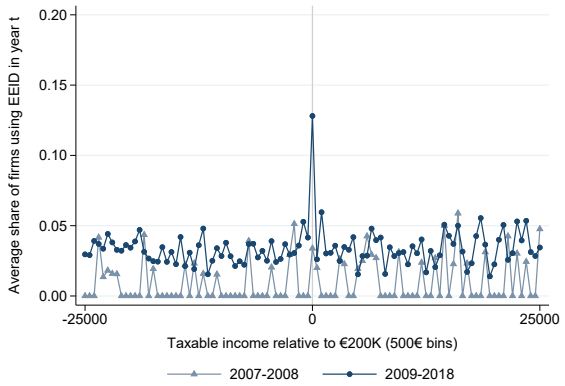
(b) *Bunching at the top PIT kink*



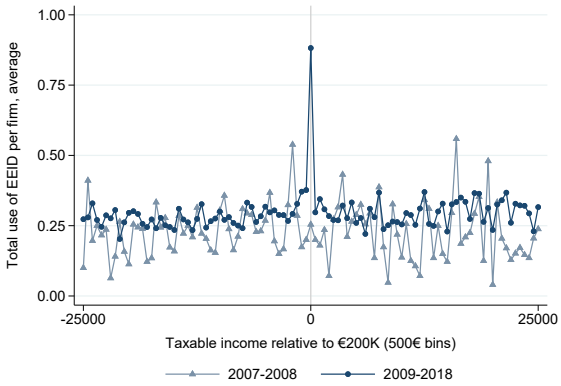
Notes: The figure focuses on taxable income reported by unincorporated firms over 2009–2018. It plots the average total use of EEID per firm in each €500 taxable income bin as well as the average share of firms using EEID in year t. Figure (a) considers unincorporated firms reporting taxable income within ±€10,000 of €200,000. Figure (b) considers unincorporated firms reporting taxable income within ±€10,000 of the top personal income tax kink (see Online Appendix).

Figure A16 – *Use of EEID and bunching at €200,000: 2007–2008 vs. 2009–2018*

(a) *Share of firms*



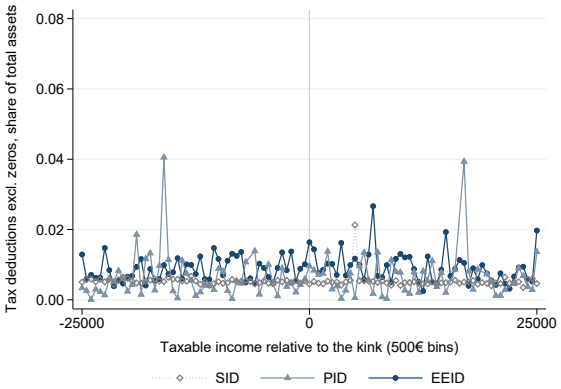
(b) *Total use per firm*



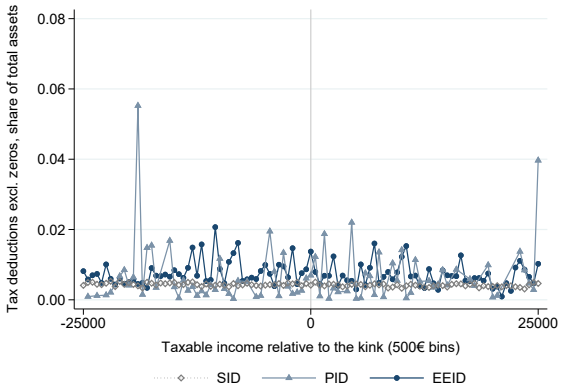
Notes: The figures show EEID use of firms reporting taxable income within ±€25,000 of €200,000 in taxable income, in €500 bins. Figure (a) shows the yearly share of firms using deduction and declaring corporate taxable income near €200,000 in 2007–2008 (no MTR change) versus the share of firms doing so in 2009–2018 (5 pp MTR change). Figure (b) focuses on the total number of times firms have used deductions over the time period they are observed.

Figure A17 – *Bunching at the €200,000 threshold: Average tax deductions*

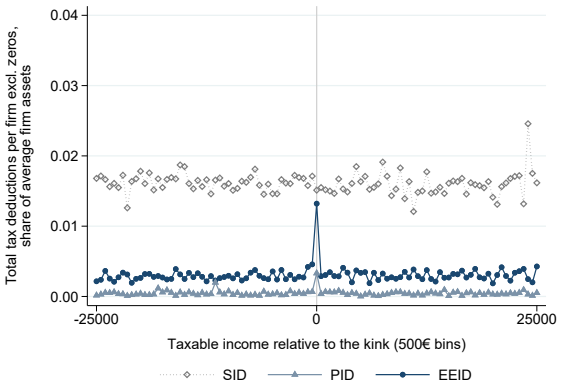
(a) *Full sample, yearly deductions*



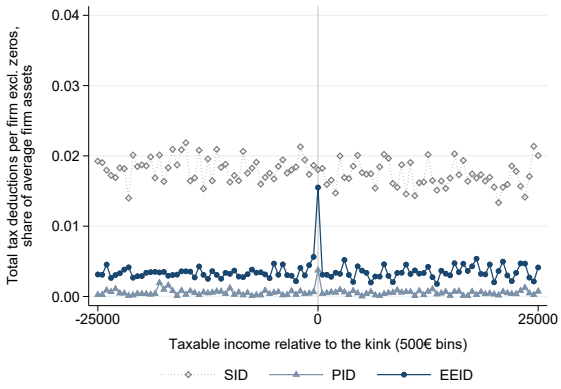
(b) *Balanced sample, yearly deductions*



(c) *Full sample, total deductions*



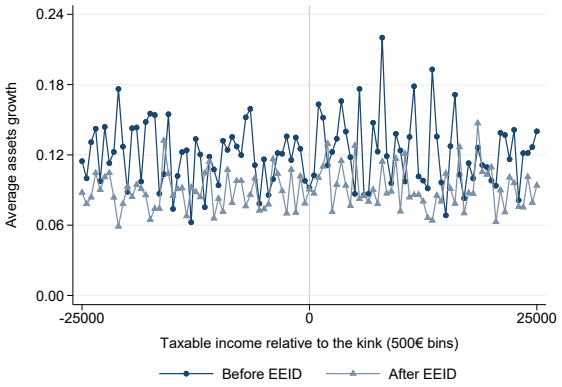
(d) *Balanced sample, total deductions*



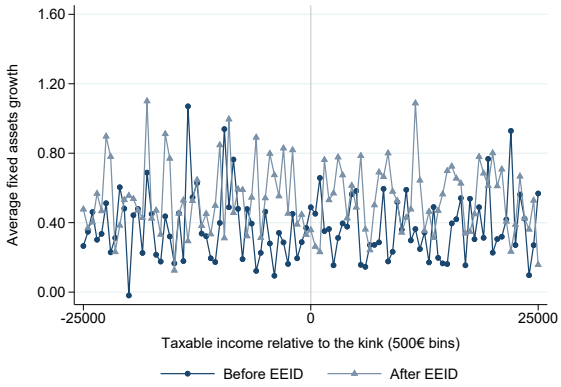
Notes: The figures plot average SID, PID and EEID for owner-managed firms declaring corporate taxable income within ±€25,000 of the kink over 2009–2018. Figures (a) and (b) plot average non-zero yearly deductions as a share of total assets. Figures (c) and (d) compute the sum of all deductions obtained by each firm over time, and divide this amount by the firms' average total assets. Assets and deductions are first expressed in 2015 euros and then winsorized at the 1st and 99th percentile for the full sample of firms before computing totals and shares. Figure (a) and (c) report results for the full sample of firms whereas figures (b) and (d) show results for a balanced sample of firms observed every year over 2009–2018.

Figure A18 – *Bunching at the €200,000 threshold: EEID use and firms' growth*

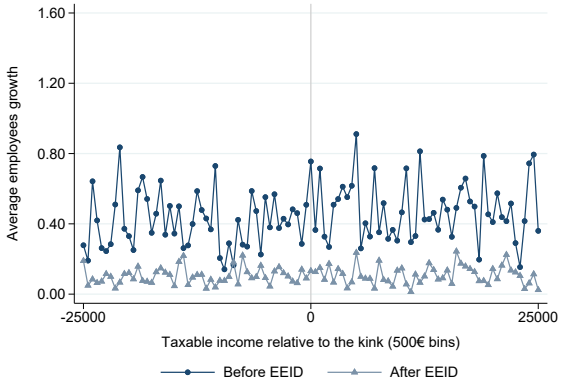
(a) *Total assets*



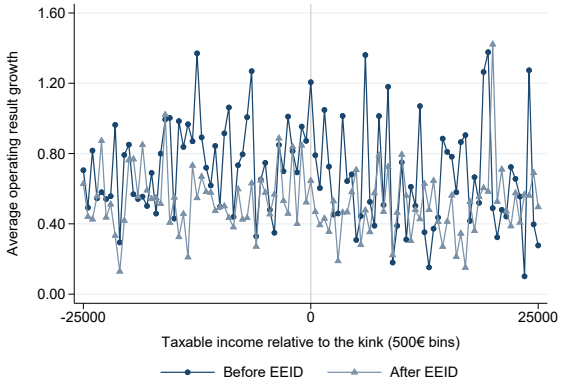
(b) *Fixed assets*



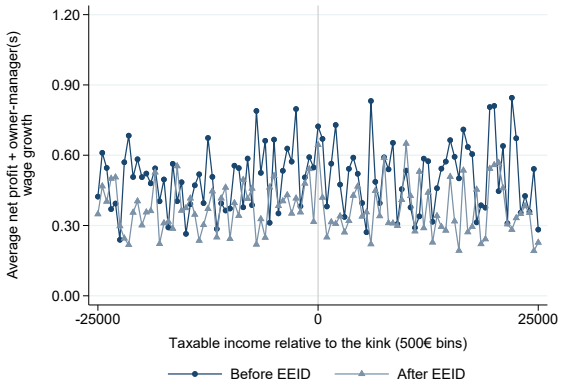
(c) *Number of employees*



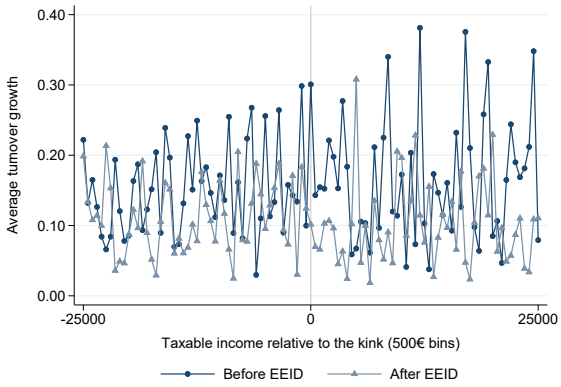
(d) *Operating result*



(e) *Net profits + owners' wage*



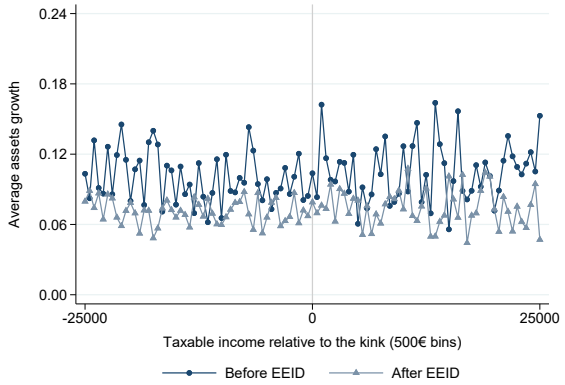
(f) *Turnover*



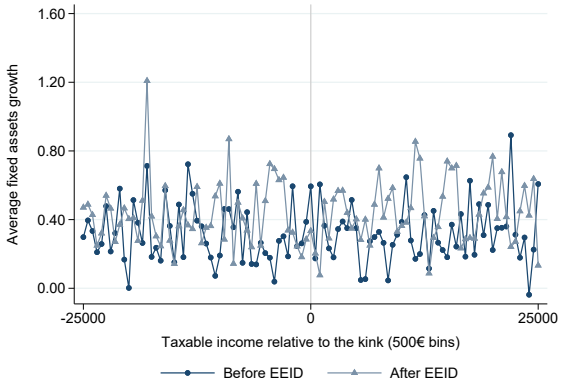
Notes: The sample consists of owner-managed firms observed over 2009–2018 that at any point in time have used EEID. For each firm, we compute average firm growth before EEID are used for the first time, and average firm growth from the year in which EEID is used for the first time. We then plot yearly corporate taxable income within €25,0000 of the kink in €500 bins on the x-axis, and compute average growth in each taxable income bin on the y-axis. Figures (a), (c), (e) summarize data reported in firms corporate tax returns whereas figures (b), (d) and (f) report accounting variables for the matched sample of firms. All variables are expressed in 2015 euros and winsorized at the 1st and 99th percentile after computing growth rates.

Figure A19 – *Bunching at the €200,000 threshold: EEID use and firms' growth, balanced sample of firms*

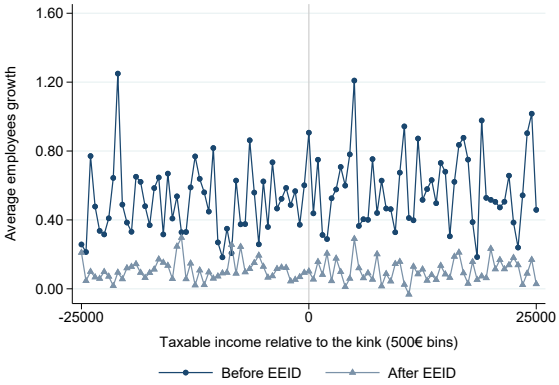
(a) *Total assets*



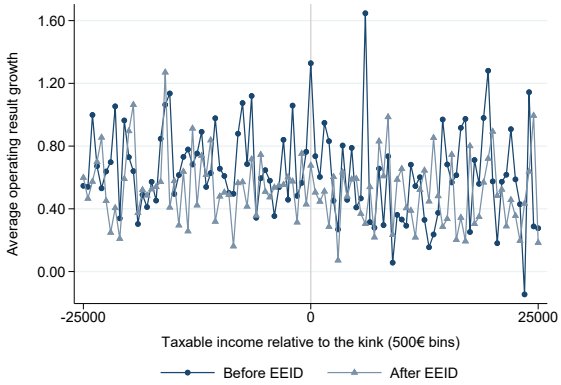
(b) *Fixed assets*



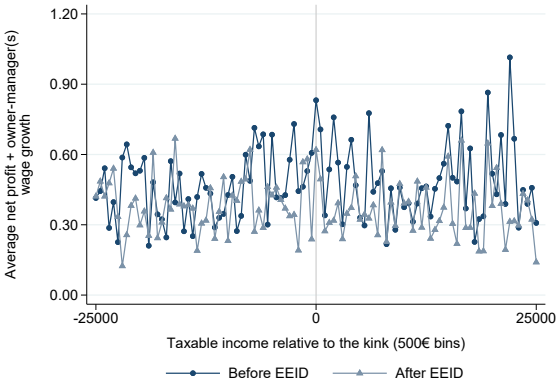
(c) *Number of employees*



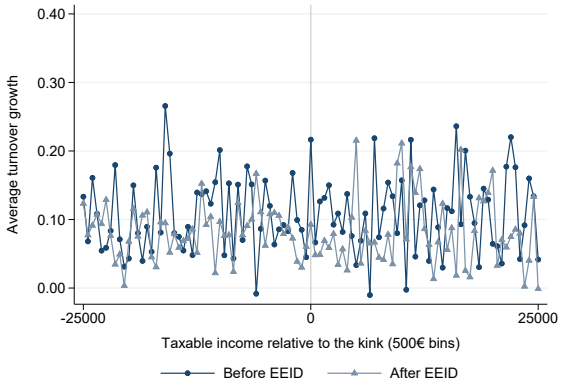
(d) *Operating result*



(e) *Net profits + owners' wage*



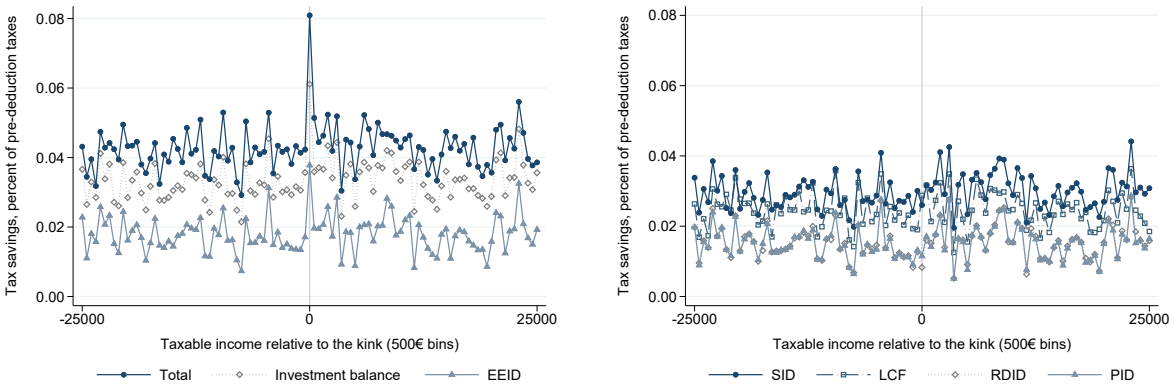
(f) *Turnover*



Notes: The sample consists of owner-managed firms that are observed every year over 2009–2018 that at any point in time have used EEID. For each firm, we compute average firm growth before EEID are used for the first time, and average firm growth from the year in which EEID is used for the first time. We then plot yearly corporate taxable income within €25,0000 of the kink in €500 bins on the x-axis, and compute average growth in each taxable income bin on the y-axis. Figures (a), (c), (e) summarize data reported in firms corporate tax returns whereas figures (b), (d) and (f) report accounting variables for the matched sample of firms. All variables are expressed in 2015 euros and winsorized at the 1st and 99th percentile after computing growth rates.

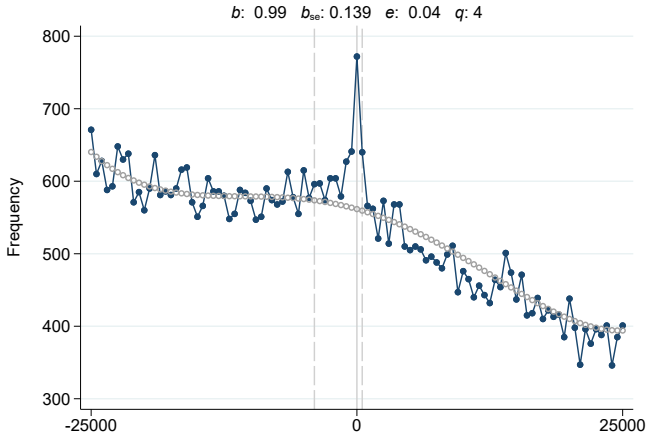
Figure A20 – *Bunching at the €200,000 threshold: Tax savings due to deductions*

(a) *Total, investment balance and EEID* (b) *Other tax deductions*



Notes: The figures plot €500 taxable income bins relative to the distance to the threshold on the x-axis. On the y-axis the figure shows average corporate tax saving per bin. This is computed as the difference between CIT paid and the CIT that would have been due in the absence of tax deductions, expressed as a share of pre-deduction CIT due. Figure (a) shows CIT savings associated to EEID, the investment balance and total CIT savings. The latter is obtained by adding to taxable income both the LCF and the investment balance (i.e. the sum of SID, EEID, RDID, PID and disinvestment addition). Figure (b) reports results for the remaining tax deductions, i.e. SID, LCF, RDID and PID. The sample consists of owner-managed companies over 2009–2018 with corporate taxable income within €25,0000 of the kink.

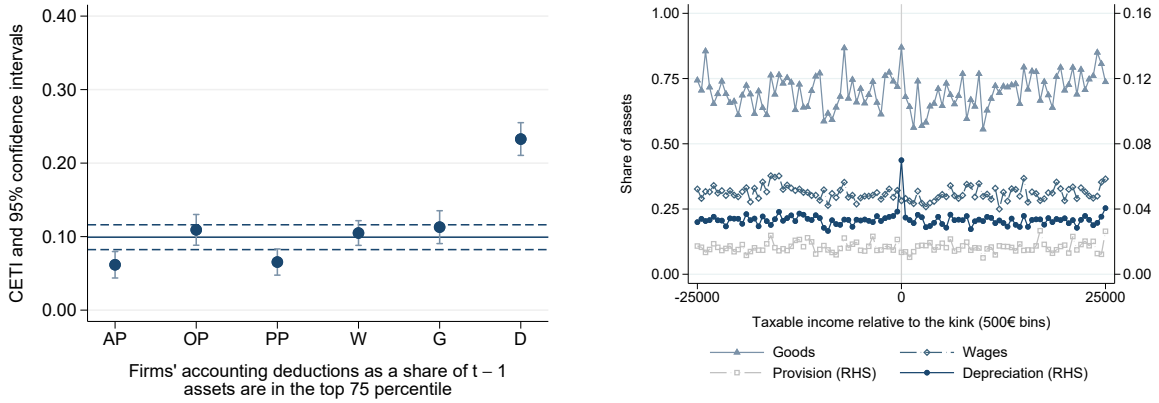
Figure A21 – *Bunching at the €200,000 threshold: Accounting for tax deductions*



Notes: The figure plots €500 income bins relative to the distance to the threshold on the x-axis and the frequency of firms in each bin on the y-axis (solid dots). Income is the sum of taxable income and all observed deductions, consisting of LCF and the balance of ID (SID, EEID, RDID, PID and disinvestment addition). The hollow dots represent the counterfactual density estimated using equation 4. The taxable income distribution is normalized by the kink, marked by the solid vertical line. The vertical dashed lines represent the bunching window, which is fixed to reflect that of figure 1. b is the relative excess mass, b_{se} is its standard error, e is the elasticity and q the polynomial order chosen using the BIC. The sample consists of owner-managed companies over 2009–2018 with income within €25,0000 of the kink.

Figure A22 – *Bunching at the €200,000 threshold: Other accounting deductions*

(a) *CETI* (b) *Average*



Notes: Figure (a) displays CETI estimates for firms using large accounting deductions. The blue dots represent the CETI and the range around it the 95 percent confidence interval. The horizontal line represents the CETI obtained in figure 1 and its confidence interval. We compute the CETI for firms with accounting deductions as a share as a share of firm's total assets in $t-1$ (winsorized on the full sample at the 1st and 99th percentile) in the top 25th percentile of firms reporting corporate taxable income within ±€25,000 of the kink. The first three estimates refer to the change in provisions reported on firms' balance-sheet, where PP and OP are pension and other provisions respectively and AP refers to the total. These measures are observed for the full sample of owner-managed firms over 2009–2018. W is total wage expenditure, G goods and materials expenditure and D assets' depreciation, as reported on the profit and loss statement for the matched sample. All CETI estimates are obtained using a €500 bin width and using Bosch et al. (2020)'s data driven procedure to select the bunching window and the BIC to determine the polynomial order.

Table A5 – *Bunching at the €200,000 threshold: EEID, depreciation and AFF firms*

Sample	b	b_{se}	e	CI−	CI+	Δ TI, %	N	q	δ^-	δ^+	N $[\delta^-, \delta^+]$
Baseline sample	1.28	0.11	0.10	0.08	0.12	0.64	51718	4	-8	1	12300
Matched sample	1.64	0.12	0.13	0.11	0.15	0.82	39807	3	-8	1	9619
EEID in t	4.55	0.30	0.35	0.31	0.40	2.28	1816	1	-1	1	273
EEID $t*1$	2.48	0.15	0.19	0.17	0.21	1.24	10267	2	-2	1	1367
Depreciation p75–p100 in t	3.22	0.19	0.25	0.22	0.28	1.61	7924	1	-2	1	1132
Depreciation p75–p100 in t & EEID $t*1$	6.62	0.35	0.51	0.46	0.57	3.31	2299	1	-3	1	532
Depreciation p75–p100 & EEID in t	9.12	0.64	0.71	0.61	0.80	4.56	658	1	-3	1	187
AFF in t	5.22	0.50	0.40	0.33	0.48	2.61	1576	2	-2	1	314
AFF in t & EEID $t*1$	10.07	0.68	0.78	0.68	0.88	5.04	790	1	-2	1	222

Notes: The table reports CETI estimates for different subgroups of owner-managed companies using EEID and large assets depreciation over 2009–2018. $t*1$ indicates firms using EEID at least once over the time period they are observed. Depreciation p75–p100 refers to firms whose assets depreciation in year t as a share of $t-1$ assets (winsorized at the 1st and 99th percentile on the full sample) is above the 75th percentile of firms with corporate taxable income within ±€25,000 of the kink. AFF indicates firms operating in agriculture, forestry and fishing industries. The sample consists of owner-manged firms over 2009–2018. b is the relative excess mass and b_{se} its standard error. e is the CETI and CI− and CI+ are its 95 percent confidence intervals. Δ TI is the change in corporate taxable income associated with the CETI for the 5 pp CIT increase at the kink. N is the number of observations in the estimation range, i.e. those firms declaring corporate taxable income within ±€25,000 of the kink. q is the polynomial order, determined using the BIC. $[\delta^-, \delta^+]$ are the lower and upper bounds of the bunching window, determined using Bosch et al. (2020)'s data driven procedure. N $[\delta^-, \delta^+]$ reports the number of observations in the bunching window. The bin width used in all estimates is of €1,000.

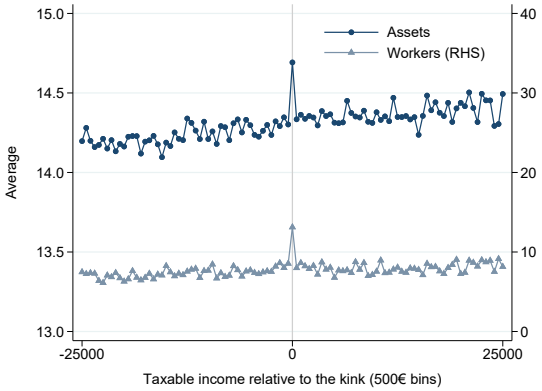
Table A6 – *Bunching at the €200,000 threshold: Firms' characteristics*

Sample	b	b_{se}	e	CI−	CI+	Δ TI, %	N	q	δ^-	δ^+	N $[\delta^-, \delta^+]$
Baseline	2.13	0.20	0.08	0.07	0.10	0.53	51242	5	-8	1	6647
Firm qualified for audit $t*1$	6.31	0.74	0.24	0.19	0.30	1.58	1249	7	-3	1	174
Assets p0–p50	1.32	0.17	0.05	0.04	0.06	0.33	25607	4	-3	1	1696
Assets p50–p75	1.85	0.23	0.07	0.05	0.09	0.46	12771	7	-3	1	944
Assets p75–p90	2.53	0.27	0.10	0.08	0.12	0.63	7653	7	-4	1	715
Assets p90–p100	3.15	0.27	0.12	0.10	0.14	0.79	5117	7	-2	1	413
Number of employees p0–p50	1.36	0.17	0.05	0.04	0.07	0.34	21131	1	-3	1	1336
Number of employees p50–p75	2.46	0.27	0.10	0.08	0.12	0.61	16021	2	-6	1	1759
Number of employees p75–p90	3.19	0.27	0.12	0.10	0.14	0.80	7866	3	-5	1	832
Number of employees p90–p100	5.21	0.35	0.20	0.17	0.23	1.30	5270	2	-4	2	669
Firm age p0–p50	2.08	0.16	0.08	0.07	0.09	0.52	24062	3	-3	1	1765
Firm age p50–p75	1.80	0.20	0.07	0.05	0.09	0.45	13852	7	-4	1	1176
Firm age p75–p90	1.30	0.20	0.05	0.04	0.07	0.32	7050	7	-1	1	332
Firm age p90–p100	2.02	0.30	0.08	0.06	0.10	0.50	5666	3	-3	1	409
Equity p0–p50	2.24	0.22	0.09	0.07	0.10	0.56	24690	3	-7	1	2851
Equity p50–p75	2.35	0.22	0.09	0.07	0.11	0.59	12318	2	-3	1	950
Equity p75–p90	2.08	0.22	0.08	0.06	0.10	0.52	7388	7	-1	2	510
Equity p90–p100	1.84	0.25	0.07	0.05	0.09	0.46	4937	7	-2	1	320
Professional, scientific and technical (M)	1.39	0.23	0.05	0.04	0.07	0.35	11763	3	-3	1	773
Financial and insurance (K)	0.82	0.19	0.03	0.02	0.05	0.20	8966	7	-1	1	368
Wholesale and retail trade (G)	1.91	0.23	0.07	0.06	0.09	0.48	8828	7	-3	1	684
Human health and social work (Q)	0.87	0.28	0.03	0.01	0.05	0.22	4872	1	-1	1	187
Manufacturing (C)	3.12	0.40	0.12	0.09	0.15	0.78	2887	1	-2	1	203
Construction (F)	1.42	0.30	0.06	0.03	0.08	0.35	2711	4	-1	1	131
Administrative and support service (N)	0.58	0.40	0.02	-0.01	0.05	0.14	1852	1	-1	1	65
Real estate (L)	1.53	0.39	0.06	0.03	0.09	0.38	1826	7	-2	1	114
Agriculture, forestry and fishing (A)	10.77	0.73	0.42	0.36	0.47	2.69	1563	2	-3	1	269
Transporting and storage (H)	3.85	0.42	0.15	0.12	0.18	0.96	1262	1	-1	1	85
Information and communication (J)	1.30	0.44	0.05	0.02	0.08	0.32	1144	1	-1	1	48
Accommodation and food service (I)	2.27	0.56	0.09	0.05	0.13	0.57	1125	1	-1	1	58
Arts, entertainment and recreation (R)	1.07	0.64	0.04	-0.01	0.09	0.27	597	1	-1	1	24
1 owner-manager in t	1.76	0.17	0.07	0.06	0.08	0.44	39789	5	-4	3	4072
2 owner-managers in t	3.85	0.27	0.15	0.13	0.17	0.96	10672	1	-5	1	1159
3 or more owner-managers in t	2.17	0.21	0.08	0.07	0.10	0.54	50461	5	-8	2	7072

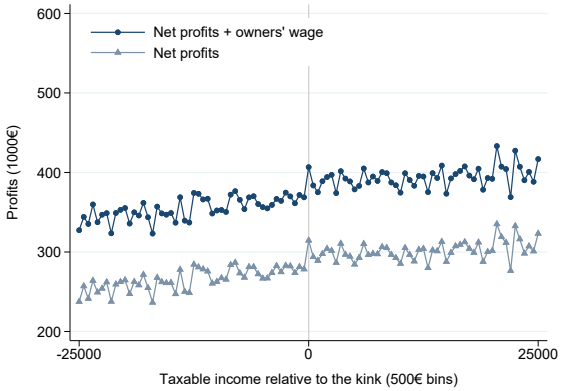
Notes: The table reports CETI estimates for different subgroups of owner-managed companies over 2009–2018. $t*1$ indicates firms qualifying for an audit at least once over the time period they are observed. Assets and equity are expressed in natural logarithms and in 2015 euros. Percentiles of assets, equity, number of employees and firm age are calculated for all firms declaring corporate taxable income within ±€25,000 of the kink. b is the relative excess mass and b_{se} its standard error. e is the CETI and CI− and CI+ are its 95 percent confidence intervals. Δ TI is the change in corporate taxable income associated with the CETI for the 5 pp CIT increase at the kink. N is the number of observations in the estimation range, i.e. those firms declaring corporate taxable income within ±€25,000 of the kink. q is the polynomial order, determined using the BIC. $[\delta^-, \delta^+]$ are the lower and upper bounds of the bunching window, determined using Bosch et al. (2020)'s data driven procedure. N $[\delta^-, \delta^+]$ reports the number of observations in the bunching window. The bin width used in all estimates is of €500.

Figure A23 – *Bunching at the €200,000 threshold: Firms size and profitability*

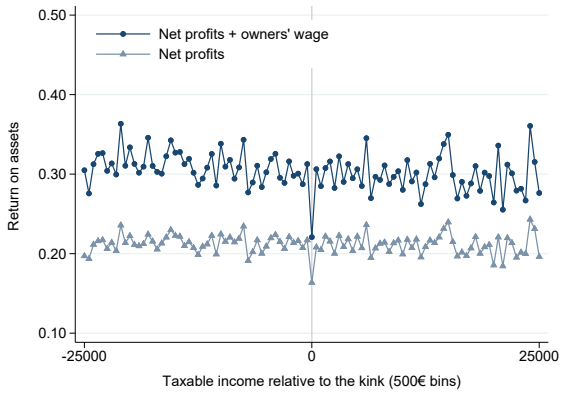
(a) *Firm size*



(b) *Profits*



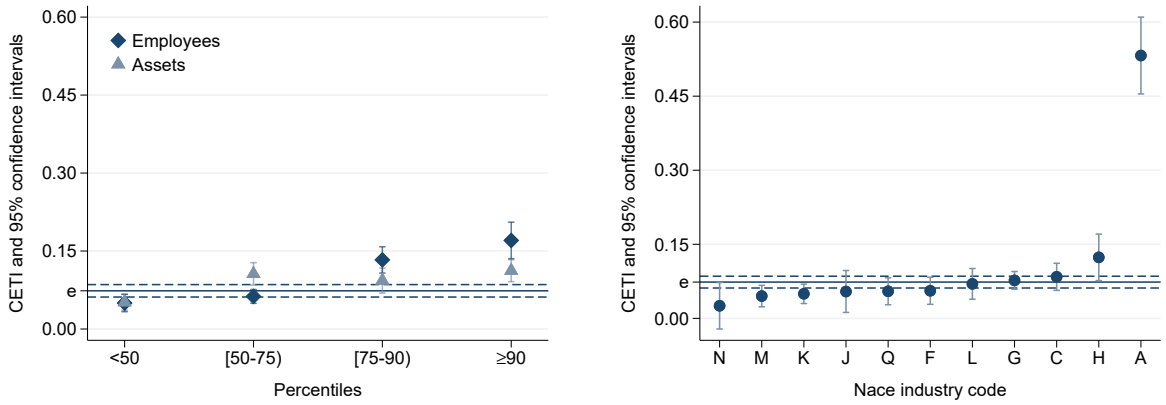
(c) *Return on assets*



Notes: The figures plot average firm size, profits and profitability in each €500 taxable income bin for firms declaring corporate taxable income within ±€25,000 of the kink. The sample contains owner-managed companies over 2009–2018 and monetary values are expressed in 2015 euros. Figure (a) plots the natural logarithm of total assets and the number of employees. Figure (b) plots average net profits and net profits plus owner wages in thousands of euros. Figure (c) divides net profits and net profits plus owners' wages by firms' total assets. All monetary variables are winsorized at the 1st and 99th percentile on the full sample.

Figure A24 – *Bunching at the €200,000 threshold: Firms' heterogeneity, balanced panel*

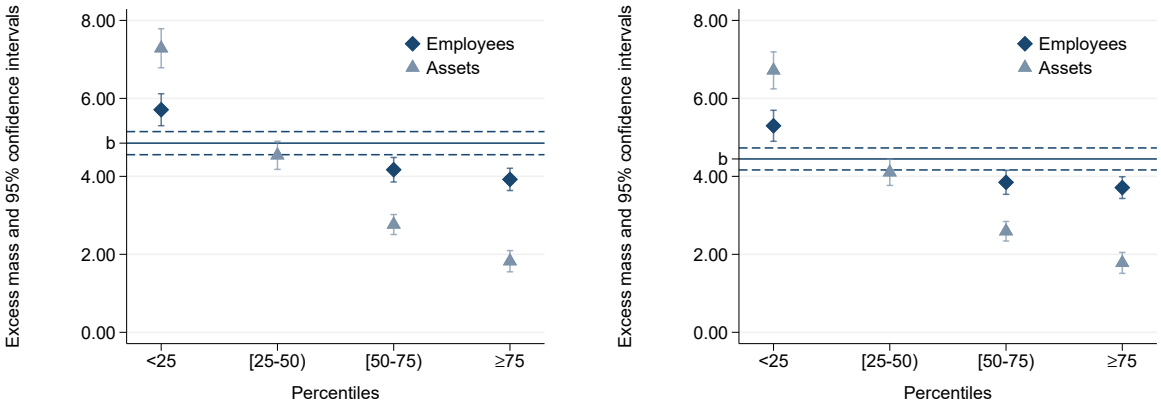
(a) *Size* (b) *Industry*



Notes: The figures plot CETI estimates for different subgroups based on firms' characteristics for the sample of owner-managed companies observed every year over 2009–2018 and reporting corporate taxable income within €25,000 of the kink. The y-axis reports the estimated CETI and its 95 percent confidence interval. The horizontal lines represent the baseline elasticity of figure 1 and its 95 percent confidence interval. Figure (a) shows the CETI for different percentiles of firms' size, defined in terms of assets (natural logarithm, in 2015 euros) and employees percentiles within the estimation range. Figure (a) shows the CETI for different industry Nace classification codes. For all estimates, the bunching window is determined using Bosch et al. (2020)'s data driven procedure and q using the BIC and the bin width is of €500.

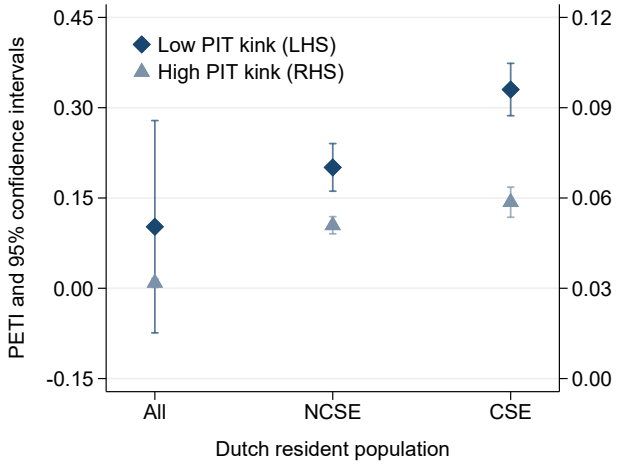
Figure A25 – *Bunching at the zero threshold: Heterogeneity in firms' size*

(a) *All firms* (b) *Firms observed at least 4 years*



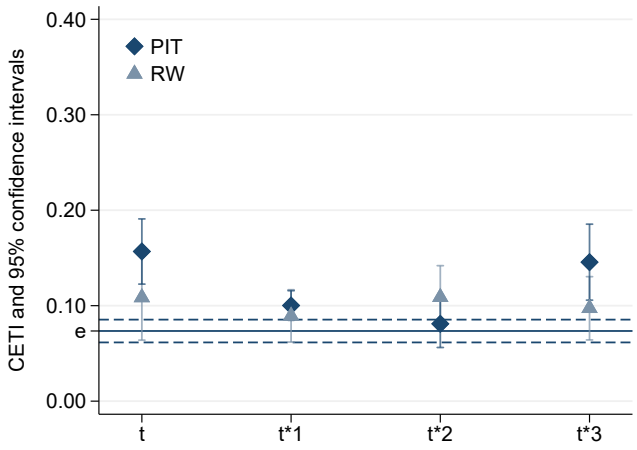
Notes: The figure plots excess mass estimates obtained for different subgroups based on size percentiles, measured in terms of assets (natural logarithm, in 2015 euros) and number of employees. The y-axis reports the estimated CETI and its 95 percent confidence interval. The horizontal lines report the baseline excess mass obtained for the full sample of firms and its 95 percent confidence interval. In figure (a) the sample consists of owner-managed companies over 2009–2018. Figure (b) restrict the sample to contain only firms that are observed at least four years over this period. For all estimates, the bunching window is fixed to $[-4, 5]$ bins below and above the kink, q is determined using the BIC, the bin width is of €500 and the range is €25,000.

Figure A26 – *Personal elasticity of taxable income*



Notes: The figure plots PETI estimates obtained for the full population, for unincorporated entrepreneurs (NCSE) and for owner-managers (CSE), measured at the lowest and highest PIT thresholds. The PETI is computed as described in 3.1, and by taking averages over 2009–2018 to measure the kink and the average change in PIT rates at the kink. For all estimates, the bunching window is determined using Bosch et al. (2020)'s data driven procedure and q using the BIC, the bin width is of €500 and the estimation range is of ±€10,000.

Figure A27 – *Bunching at the €200,000 threshold: Owner-managers' behavior, balanced sample*



Notes: The figure plots CETI estimates obtained for different subgroups based on personal tax return items of the owner-manager. The y-axis reports estimated elasticities and their 95 percent confidence interval. The horizontal lines represent the baseline elasticity and its 95 percent confidence interval. Estimates are for firms observed every year over 2009–2018 and reporting corporate taxable income within €25,000 of the kink. PIT refers to owner-managers reporting personal taxable income within ±€500 of the top PIT threshold whereas RW refers to owner-managers reporting a wage within ±€500 of the reference wage specified by the tax authorities each year. For firms with more than one owner, the variables mark firms where at least one of such owners exist. t refers to the CETI for firms with PIT or RW in year t whereas $t * i,\ i = 1, 2, 3$ marks firms with PIT or RW at least once, twice, or three times over the time period they are observed. For all estimates, the bunching window is determined using Bosch et al. (2020)'s data driven procedure and q using the BIC, and the bin width is of €500.

Table A7 – *Owner-managers' behavior along PIT and CIT kinks*

Sample	b	b_{se}	e	CI−	CI+	Δ TI, %	N	q	δ^-	δ^+	N $[\delta^-, \delta^+]$
CETI											
Baseline	2.13	0.20	0.08	0.07	0.10	0.53	51242	5	-8	1	6647
PTI $\in [-w, w]$ of PIT kinks in t	3.87	0.36	0.15	0.12	0.18	0.97	2358	1	-2	1	185
PTI $\in [-w, w]$ of PIT kinks $t*1$	3.79	0.28	0.15	0.13	0.17	0.95	13907	2	-9	1	2160
PTI $\in [-w, w]$ of PIT kinks $t*2$	3.78	0.39	0.15	0.12	0.18	0.95	4906	2	-6	1	605
PTI $\in [-w, w]$ of PIT kinks $t*3$	3.30	0.46	0.13	0.09	0.16	0.83	1853	2	-2	1	147
Wage $\in [-w, w]$ of RW in t	3.42	0.47	0.13	0.10	0.17	0.85	1827	1	-2	1	133
Wage $\in [-w, w]$ of RW $t*1$	2.38	0.29	0.09	0.07	0.11	0.60	6840	2	-3	1	523
Wage $\in [-w, w]$ of RW $t*2$	2.81	0.32	0.11	0.08	0.13	0.70	3714	2	-3	1	301
Wage $\in [-w, w]$ of RW $t*3$	2.51	0.37	0.10	0.07	0.13	0.63	2199	1	-1	1	119
PETI											
Baseline	1.38	0.05	0.06	0.06	0.06	1.19	810797	6	-5	3	229451
CTI $\in [-\delta, \delta]$ of CIT kink in t	2.56	0.29	0.11	0.09	0.14	2.21	2628	2	-1	2	467
CTI $\in [-\delta, \delta]$ of CIT kink $t*1$	2.25	0.22	0.10	0.08	0.12	1.95	23136	2	-10	4	10615
CTI $\in [-\delta, \delta]$ of CIT kink $t*2$	3.66	0.40	0.16	0.13	0.20	3.16	2519	2	-3	3	718
CTI $\in [-\delta, \delta]$ of CIT kink $t*3$	4.64	0.65	0.20	0.15	0.26	4.00	484	1	-1	2	106
CTI $\in r \wedge$ CTI $\notin [-\delta, \delta]$ $\forall t$ of CIT kink in t	1.84	0.15	0.08	0.07	0.09	1.59	18886	5	-3	4	5242
CTI $\in r \wedge$ CTI $\notin [-\delta, \delta]$ $\forall t$ of CIT kink $t*1$	1.97	0.14	0.09	0.07	0.10	1.70	104331	2	-7	8	48795
CTI $\in r \wedge$ CTI $\notin [-\delta, \delta]$ $\forall t$ of CIT kink $t*2$	2.08	0.16	0.09	0.08	0.11	1.79	34839	2	-8	5	14956
CTI $\in r \wedge$ CTI $\notin [-\delta, \delta]$ $\forall t$ of CIT kink $t*3$	2.08	0.16	0.09	0.08	0.11	1.79	34839	2	-8	5	14956

Notes: The table reports CETI estimates for different subgroups of owner-managed companies and PETI estimates for different subgroups of owner-managers over 2009–2018. For CETI estimates, we consider companies reporting corporate taxable income (CTI) within ±25,000€of the kink. PETI estimates are for owner-managers reporting personal taxable income (PTI) within ±10,000€of the top PIT kink. PTI $\in [-w, w]$ of PIT kinks indicates companies for which there is at least one owner-manager reporting personal taxable income within ±€500 of any of the PIT kinks. Wage $\in [-w, w]$ of RW indicates the company has at least one owner-manager paying herself a wage within ±€500 of the RW. CTI $\in [-\delta, \delta]$ of CIT kink refers to those owner-managers whose company reports corporate taxable income within $[-\delta, \delta]$ of the CIT kink, i.e. a range set to reflect the bunching window obtained in figure 1 using Bosch et al. (2020)'s procedure. CTI $\in r \wedge$ CTI $\notin [-\delta, \delta]$ $\forall t$ of CIT kink refers to owner-managers whose company reports corporate taxable income within ±€25,000 of the CIT kink, but never within $[-\delta, \delta]$ over the time period the firm is observed. t refers to the CETI (PETI) for firms (owner-managers) whose owners (firms) display the behavior in year t whereas $t*i$, $i = 1, 2, 3$ marks the repeating of the behavior at least once, twice, or three times over the time period they are observed. b is the relative excess mass and b_{se} the standard error, e the CETI or PETI and CI its 95 percent confidence interval. Δ TI is the percent change in taxable income associated with e. N is the number of observations in the estimation range, q the polynomial order determined using the BIC, $[\delta^-, \delta^+]$ is the bunching window, determined using Bosch et al. (2020)'s data driven procedure. N $[\delta^-, \delta^+]$ reports the number of observations in the bunching window. For all estimates, the bin width is of €500.

Table A8 – *Bunching at the €200,000 threshold: Entrepreneurs' characteristics*

Sample	b	b_{se}	e	CI−	CI+	Δ TI, %	N	q	δ^-	δ^+	N $[\delta^-, \delta^+]$
Baseline sample	1.72	0.17	0.07	0.05	0.08	0.43	35261	5	-4	3	3599
Men	1.53	0.15	0.06	0.05	0.07	0.38	30147	5	-3	1	2095
Women	2.46	0.36	0.10	0.07	0.12	0.62	3744	1	-4	1	316
Education low	1.73	0.54	0.07	0.03	0.11	0.43	584	2	-1	1	30
Education medium	2.11	0.35	0.08	0.05	0.11	0.53	2749	1	-1	1	140
Education high	1.49	0.19	0.06	0.04	0.07	0.37	11468	3	-2	1	647
Owner-manager age p0–p25	1.59	0.18	0.06	0.05	0.08	0.40	8153	7	-2	1	497
Owner-manager age p25–p50	1.24	0.20	0.05	0.03	0.06	0.31	7931	4	-1	1	363
Owner-manager age p50–p75	2.41	0.27	0.09	0.07	0.11	0.60	8537	1	-2	3	707
Owner-manager age p75–p100	1.69	0.29	0.07	0.04	0.09	0.42	9236	1	-3	1	612
Single	0.68	0.19	0.03	0.01	0.04	0.17	5449	7	-1	1	227
With partner	2.06	0.18	0.08	0.07	0.09	0.52	29140	3	-4	3	3007
Main breadwinner	1.86	0.19	0.07	0.06	0.09	0.46	30927	5	-4	4	3504
Secondary breadwinner	1.98	0.30	0.08	0.05	0.10	0.50	3310	1	-2	1	196

Notes: The table reports CETI estimates for different subgroups of owner-managed companies over 2009–2018 reporting corporate taxable income within €25,000 of the kink. Only firms with at most one owner-manager and for which the owner is managing at most one firm are included in the sample. Percentiles of entrepreneurs' age are calculated based on all firms declaring corporate taxable income within ±€25,000 of the kink. b is the relative excess mass and b_{se} the standard error, e the CETI and CI its 95 percent confidence interval. Δ TI is the percent change in taxable income associated with the CETI following a 5 pp CIT increase. N is the number of observations in the estimation range, q the polynomial order determined using the BIC, $[\delta^-, \delta^+]$ is the bunching window, determined using Bosch et al. (2020)'s data driven procedure. N $[\delta^-, \delta^+]$ reports the number of observations in the bunching window. For all estimates, the bin width is of €500.

Table A9 – *Correlates in bunching: Full set of results*

	(1)	(2)	(3)	(4)
EEID	0.021***	0.026***	0.031***	0.025***
	(0.008)	(0.009)	(0.007)	(0.009)
PID	0.005	0.005	0.006	0.005
	(0.017)	(0.017)	(0.017)	(0.017)
SID	-0.012***	-0.011*	-0.012***	-0.010*
	(0.004)	(0.006)	(0.003)	(0.006)
Maximal SID	-0.005	-0.005	-0.005	-0.005
	(0.008)	(0.008)	(0.008)	(0.008)
RDID	-0.011	-0.011	-0.010	-0.011
	(0.018)	(0.018)	(0.018)	(0.018)
LCF	0.009	0.009	0.009	0.009
	(0.007)	(0.007)	(0.007)	(0.007)
EEID $t*2$	0.033***			
	(0.007)			
EEID in t and $t-1$ or $t+1$		0.028*		0.022
		(0.016)		(0.016)
EEID in t and PID in $t+1$ (no SID in t)			0.155***	0.147***
			(0.044)	(0.044)
SID $t*2$	-0.002			
	(0.004)			
SID in t and t-1 or t+1		-0.002		-0.002
		(0.006)		(0.006)
SID in t and PID in $t+1$ (no EEID in t)			0.007	0.008
			(0.028)	(0.028)
Maximal SID $t*2$	0.002	0.005	0.004	0.004
	(0.006)	(0.006)	(0.006)	(0.006)
PID $t*2$	0.025	0.034*	0.027	0.026
	(0.018)	(0.018)	(0.019)	(0.019)
RDID $t*2$	0.016	0.018	0.018	0.018
	(0.011)	(0.011)	(0.011)	(0.011)
LCF $t*2$	-0.002	-0.002	-0.002	-0.002
	(0.008)	(0.008)	(0.008)	(0.008)
Assets p50-p75	-0.002	-0.002	-0.002	-0.002
	(0.004)	(0.004)	(0.004)	(0.004)
Assets p75-p90	0.000	0.002	0.002	0.002
	(0.005)	(0.005)	(0.005)	(0.005)
Assets p90-p100	0.005	0.006	0.006	0.006
	(0.006)	(0.006)	(0.005)	(0.006)
Employees p50-p75	0.011***	0.011***	0.011***	0.011***
	(0.004)	(0.004)	(0.004)	(0.004)
Employees p75-p90	0.015***	0.015***	0.015***	0.015***
	(0.005)	(0.005)	(0.005)	(0.005)
Employees p90-p100	0.023***	0.024***	0.024***	0.024***
	(0.006)	(0.006)	(0.006)	(0.006)
Tax returns filed as a group	-0.004	-0.003	-0.003	-0.003
	(0.003)	(0.003)	(0.003)	(0.003)
2 or more owners	0.004	0.005	0.005	0.005
	(0.004)	(0.004)	(0.004)	(0.004)
Δ provisions p75-p100	-0.008*	-0.007*	-0.007*	-0.007*
	(0.004)	(0.004)	(0.004)	(0.004)
Goods p75-p100	0.001	0.001	0.001	0.001
	(0.005)	(0.005)	(0.005)	(0.005)
Depreciation p75-p100	0.025***	0.026***	0.026***	0.026***
	(0.005)	(0.005)	(0.005)	(0.005)
Agriculture, forestry and fishing	0.056***	0.060***	0.060***	0.060***
	(0.010)	(0.010)	(0.010)	(0.010)
Professional, scientific and technical activities	-0.003	-0.003	-0.003	-0.003
	(0.008)	(0.008)	(0.008)	(0.008)
Electricity, gas, steam and air conditioning supply	0.148***	0.149***	0.149***	0.150***
	(0.046)	(0.046)	(0.046)	(0.046)
Transport and storage	0.003	0.003	0.003	0.003
	(0.011)	(0.011)	(0.011)	(0.011)
Owner(s) TI within [500,500] of any PIT kink	0.006	0.006	0.006	0.006
	(0.008)	(0.008)	(0.008)	(0.008)
Owner(s) TI within [500,500] of any PIT kink $t*2$	0.012**	0.012**	0.013**	0.013**
	(0.005)	(0.005)	(0.005)	(0.005)
Owner(s) wage within [500,500] of reference wage	0.008	0.008	0.009	0.008
	(0.009)	(0.009)	(0.009)	(0.009)
Owner(s) wage within [500,500] of reference wage $t*2$	-0.004	-0.004	-0.004	-0.004
	(0.007)	(0.007)	(0.007)	(0.007)
Observations	49,750	49,750	49,750	49,750
Year dummies	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes
Baseline probability	0.119	0.119	0.119	0.119

Notes: The table reports the full set of results described in table 4.

Table A10 – *Correlates in bunching: Robustness*

	Alternative model specification		±€15,000 range	[−1500€,500€] bunching window	Balanced panel
	(1)	(2)	(3)	(4)	(5)
EEID	0.021***	0.018**	0.037***	0.022***	0.023**
	(0.008)	(0.008)	(0.012)	(0.005)	(0.010)
PID	0.003	0.015	-0.012	0.014	0.012
	(0.017)	(0.018)	(0.026)	(0.011)	(0.022)
SID	-0.012***	-0.013***	-0.019***	-0.008***	-0.017***
	(0.004)	(0.004)	(0.006)	(0.003)	(0.005)
Maximal SID	-0.004	-0.004	-0.007	-0.003	-0.008
	(0.008)	(0.008)	(0.012)	(0.006)	(0.010)
RDID	-0.007	-0.005	-0.024	-0.006	0.002
	(0.018)	(0.018)	(0.027)	(0.013)	(0.022)
LCF	0.008	0.012	0.011	0.007	0.001
	(0.007)	(0.008)	(0.011)	(0.005)	(0.011)
EEID $t*2$	0.033***	0.032***	0.047***	0.026***	0.037***
	(0.007)	(0.007)	(0.010)	(0.005)	(0.008)
SID $t*2$	-0.001	0.001	-0.001	-0.002	0.002
	(0.004)	(0.004)	(0.006)	(0.003)	(0.006)
Maximal SID $t*2$	0.003	0.004	0.006	-0.000	0.003
	(0.006)	(0.006)	(0.009)	(0.005)	(0.008)
PID $t*2$	0.023	0.020	0.036	0.018	0.023
	(0.018)	(0.018)	(0.027)	(0.012)	(0.022)
RDID $t*2$	0.014	0.012	0.028*	0.007	0.011
	(0.011)	(0.012)	(0.017)	(0.008)	(0.014)
LCF $t*2$	-0.004	-0.002	-0.003	-0.001	0.000
	(0.008)	(0.008)	(0.013)	(0.006)	(0.010)
Assets p50-p75	-0.002	-0.002	-0.004	-0.000	0.001
	(0.004)	(0.004)	(0.006)	(0.003)	(0.005)
Assets p75-p90	0.001	0.002	-0.005	0.001	0.007
	(0.005)	(0.005)	(0.007)	(0.003)	(0.006)
Assets p90-p100	0.005	0.008	0.004	0.011***	0.010
	(0.006)	(0.006)	(0.008)	(0.004)	(0.007)
Employees p50-p75	0.011***	0.012***	0.013**	0.005	0.005
	(0.004)	(0.004)	(0.006)	(0.003)	(0.005)
Employees p75-p90	0.014***	0.015***	0.018**	0.006	0.010
	(0.005)	(0.005)	(0.008)	(0.004)	(0.007)
Employees p90-p100	0.022***	0.022***	0.028***	0.017***	0.015*
	(0.006)	(0.006)	(0.010)	(0.005)	(0.008)
Tax returns filed as a group	-0.003	-0.002	-0.003	-0.003	-0.001
	(0.003)	(0.004)	(0.005)	(0.003)	(0.005)
2 or more owners	0.004	0.002	0.009	0.002	-0.001
	(0.004)	(0.004)	(0.006)	(0.003)	(0.005)
Δ provisions p75-p100	-0.007*	-0.007*	-0.012*	-0.002	-0.004
	(0.004)	(0.004)	(0.007)	(0.003)	(0.005)
Goods p75-p100	0.001	0.003	0.004	0.001	0.001
	(0.005)	(0.005)	(0.007)	(0.003)	(0.006)
Depreciation p75-p100	0.024***	0.025***	0.038***	0.026***	0.037***
	(0.005)	(0.005)	(0.007)	(0.003)	(0.006)
Agriculture, forestry and fishing		0.055***	0.077***	0.045***	0.057***
		(0.011)	(0.016)	(0.007)	(0.014)
Professional, scientific and technical		-0.000	-0.008	-0.001	-0.006
		(0.008)	(0.011)	(0.006)	(0.010)
Electricity, gas, steam and air conditioning		0.138***	0.169***	0.095***	0.184***
		(0.048)	(0.063)	(0.031)	(0.070)
Transport and storage		0.005	0.004	-0.001	-0.007
		(0.012)	(0.018)	(0.009)	(0.015)
Owner(s) TI within ±€500 of any PIT kink	0.007	0.005	0.004	0.008	0.002
	(0.008)	(0.008)	(0.012)	(0.006)	(0.010)
Owner(s) TI within ±€500 of any PIT kink $t*2$	0.013**	0.013**	0.018**	0.006	0.012*
	(0.005)	(0.005)	(0.008)	(0.004)	(0.007)
Owner(s) wage within ±€500 of RW	0.009	0.005	0.018	0.001	0.014
	(0.009)	(0.010)	(0.014)	(0.007)	(0.013)
Owner(s) wage within ±€500 of RW $t*2$	-0.005	-0.001	-0.008	-0.005	-0.002
	(0.007)	(0.007)	(0.010)	(0.005)	(0.009)
Observations	49,668	45,621	30,955	49,750	27,944
Year dummies	no	yes	yes	yes	yes
Industry dummies	no	yes	yes	yes	yes
Industry-year dummies	yes	no	no	no	no
Taxable income spline	no	yes	no	no	no
Baseline probability	0.119	0.119	0.192	0.061	0.119

Notes: The table reports robustness checks to the results reported in table 4. Column (1) includes industry-year dummies rather than industry dummies, column (2) adds a corporate taxable income split to the specification of equation 5. Column (3) restricts the estimation range to firms declaring corporate taxable income within ±€15,000 of the kink, whereas the range is of ±€25,000 in the remaining specifications. In column (4) the dependent variable is an indicator that equals one if corporate taxable income in year t is within [−€1500,€500] of the kink. Column (5) restricts the sample to a balanced panel of firms observed over 2009–2018.

Table A11 – *Persistence in firms' responsiveness: Full set of results*

	(1)	(2)	(3)	(4)
EEID	0.003**	0.004**	0.008***	0.004**
	(0.002)	(0.002)	(0.002)	(0.002)
PID	0.005	0.005	0.005	0.005
	(0.003)	(0.003)	(0.003)	(0.003)
EEID $t*2$	0.011***			
	(0.002)			
PID $t*2$	0.001	0.004	0.004	0.003
	(0.004)	(0.005)	(0.005)	(0.005)
EEID in t and $t-1$ or $t+1$		0.010***		0.009***
		(0.003)		(0.003)
EEID in t and PID in $t+1$ (no SID in t)			0.014**	0.011
			(0.007)	(0.007)
SID in t	-0.004***	0.000	-0.004***	0.000
	(0.001)	(0.002)	(0.001)	(0.002)
SID $t*2$	-0.000			
	(0.002)			
SID in t and $t-1$ or $t+1$		-0.005**		-0.005**
		(0.002)		(0.002)
SID in t and PID in $t+1$ (no EEID in t)			-0.009	-0.009
			(0.009)	(0.009)
Maximal SID in t	-0.001	-0.001	-0.001	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)
Maximal SID $t*2$	0.001	0.003	0.002	0.003
	(0.002)	(0.002)	(0.002)	(0.002)
LCF in t	-0.004	-0.004*	-0.004	-0.004*
	(0.002)	(0.002)	(0.002)	(0.002)
LCF $t*2$	0.007***	0.008***	0.007***	0.007***
	(0.002)	(0.002)	(0.002)	(0.002)
RDID in t	-0.005	-0.005	-0.005	-0.005
	(0.004)	(0.004)	(0.004)	(0.004)
RDID $t*2$	0.004	0.005	0.005	0.005
	(0.003)	(0.003)	(0.003)	(0.003)
Assets p50-p75	0.002	0.003*	0.003*	0.003*
	(0.001)	(0.001)	(0.001)	(0.001)
Assets p75-p90	0.006***	0.006***	0.006***	0.006***
	(0.002)	(0.002)	(0.002)	(0.002)
Assets p90-p100	0.007***	0.007***	0.008***	0.007***
	(0.002)	(0.002)	(0.002)	(0.002)
Employees p50-p75	0.002	0.002	0.002	0.002
	(0.002)	(0.002)	(0.002)	(0.002)
Employees p75-p90	0.000	0.001	0.000	0.001
	(0.002)	(0.002)	(0.002)	(0.002)
Employees p90-p100	0.008***	0.008***	0.008***	0.008***
	(0.002)	(0.002)	(0.002)	(0.002)
Tax returns filed as a group	0.002	0.002	0.002	0.002
	(0.002)	(0.001)	(0.001)	(0.001)
Δ provisions p75-p100	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Goods p75-p100	-0.004**	-0.003**	-0.004**	-0.003**
	(0.002)	(0.002)	(0.002)	(0.002)
Depreciation p75-p100	0.011***	0.012***	0.012***	0.012***
	(0.002)	(0.002)	(0.002)	(0.002)
2 or more owners	-0.001	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Agriculture, forestry and fishing	0.017***	0.018***	0.019***	0.018***
	(0.004)	(0.004)	(0.004)	(0.004)
Professional, scientific and technical	0.011***	0.011***	0.011***	0.011***
	(0.004)	(0.004)	(0.004)	(0.004)
Electricity, gas, steam and air conditioning	0.031***	0.031***	0.031***	0.031***
	(0.008)	(0.008)	(0.008)	(0.008)
Owner(s) TI within ±€500 of any PIT kink	0.004**	0.004**	0.004**	0.004**
	(0.002)	(0.002)	(0.002)	(0.002)
Owner(s) TI within ±€500 of any PIT kink $t*2$	0.007***	0.007***	0.007***	0.007***
	(0.002)	(0.002)	(0.002)	(0.002)
Owner(s) wage within ±€500 of RW	0.002	0.002	0.002	0.002
	(0.003)	(0.003)	(0.003)	(0.003)
Owner(s) wage within ±€500 of RW $t*2$	-0.003	-0.002	-0.002	-0.002
	(0.003)	(0.002)	(0.002)	(0.002)
Observations	49,300	49,300	49,300	49,300
Year dummies	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes
Industry-year dummies	no	no	no	no
Taxable income spline	no	no	no	no
Baseline probability	0.096	0.096	0.096	0.096

Notes: The table reports the full set of results described in table 5.

Table A12 – *Persistence in firms' responsiveness: Robustness*

	Alternative model specification		±€15,000 range	Balanced panel	Alternative dependent variables	
	(1)	(2)	(3)	(4)	(5)	(6)
EEID	0.004**	0.003	0.005*	0.005**	0.006**	0.001
	(0.002)	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)
PID	0.004	0.006*	0.004	0.010**	0.005	0.000
	(0.004)	(0.003)	(0.005)	(0.005)	(0.006)	(0.004)
EEID $t*2$	0.012***	0.011***	0.017***	0.015***	0.025***	0.006***
	(0.002)	(0.002)	(0.003)	(0.002)	(0.004)	(0.001)
PID $t*2$	0.002	0.001	0.001	0.006	0.011	-0.000
	(0.005)	(0.005)	(0.007)	(0.006)	(0.010)	(0.003)
SID	-0.004***	-0.004***	-0.006***	-0.003*	-0.011***	-0.003***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.001)
SID $t*2$	-0.000	0.000	0.000	-0.005*	0.003	-0.001
	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.001)
Maximal SID	-0.001	-0.002	-0.002	-0.001	-0.005	0.001
	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)	(0.002)
Maximal SID $t*2$	0.002	0.002	0.002	0.004	0.007	0.001
	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)	(0.002)
LCF	-0.004	-0.002	-0.007*	-0.002	-0.010**	-0.009***
	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.003)
LCF $t*2$	0.008***	0.008***	0.012***	0.004	0.007	0.004***
	(0.003)	(0.003)	(0.004)	(0.004)	(0.005)	(0.002)
RDID	-0.004	-0.004	-0.009	-0.008	-0.010	-0.004
	(0.005)	(0.004)	(0.007)	(0.007)	(0.008)	(0.004)
RDID $t*2$	0.004	0.003	0.007	0.000	0.008	0.002
	(0.004)	(0.004)	(0.006)	(0.005)	(0.007)	(0.003)
Assets p50-p75	0.002	0.002	0.004*	-0.001	0.008***	0.001
	(0.002)	(0.001)	(0.002)	(0.002)	(0.003)	(0.001)
Assets p75-p90	0.006***	0.005***	0.008***	0.002	0.010***	0.002
	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)	(0.001)
Assets p90-p100	0.007***	0.007***	0.010***	0.003	0.012***	0.004***
	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)	(0.001)
Employees p50-p75	0.002	0.001	0.003	0.000	0.006*	0.000
	(0.002)	(0.002)	(0.003)	(0.002)	(0.003)	(0.001)
Employees p75-p90	0.000	-0.001	0.001	0.002	0.005	0.001
	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)	(0.002)
Employees p90-p100	0.008***	0.007***	0.011***	0.011***	0.016***	0.006***
	(0.002)	(0.002)	(0.003)	(0.003)	(0.005)	(0.002)
Tax returns filed as a group	0.002	0.002	0.003	0.002	-0.004	0.000
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.001)
Δ provisions p75-p100	0.001	0.000	0.001	0.001	0.001	-0.000
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.001)
Goods p75-p100	-0.004**	-0.003	-0.006**	-0.005*	-0.010***	-0.003*
	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.001)
Depreciation p75-p100	0.012***	0.010***	0.016***	0.013***	0.017***	0.008***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.001)
2 or more owners	-0.002	-0.001	-0.002	-0.001	-0.000	0.001
	(0.002)	(0.001)	(0.002)	(0.002)	(0.003)	(0.001)
Agriculture, forestry and fishing		0.015***	0.025***	0.021***	0.027***	0.010***
		(0.004)	(0.006)	(0.006)	(0.007)	(0.003)
Professional, scientific and technical		0.009***	0.017***	0.013***	0.016**	0.007***
		(0.004)	(0.006)	(0.005)	(0.006)	(0.003)
Electricity, gas, steam and air conditioning		0.027***	0.045***	0.055***	0.063**	0.022***
		(0.008)	(0.012)	(0.013)	(0.026)	(0.006)
Owner(s) TI within ±€500 of any PIT kink	0.005**	0.004*	0.006**	0.008***	0.006*	0.003*
	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.002)
Owner(s) TI within ±€500 of any PIT kink $t*2$	0.007***	0.006***	0.010***	0.004	0.016***	0.005***
	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)	(0.002)
Owner(s) wage within ±€500 of RW	0.002	0.003	0.003	0.006	0.006	0.001
	(0.003)	(0.003)	(0.005)	(0.005)	(0.005)	(0.002)
Owner(s) wage within ±€500 of RW $t*2$	-0.003	-0.004	-0.005	-0.006	-0.002	-0.001
	(0.003)	(0.003)	(0.004)	(0.004)	(0.005)	(0.002)
Observations	44,131	45,215	30,681	27,517	49,655	44,816
Year dummies	no	yes	yes	yes	yes	yes
Industry dummies	no	yes	yes	yes	yes	yes
Industry-year dummies	yes	no	no	no	no	no
Taxable income spline	no	yes	no	no	no	no
Baseline probability	0.096	0.096	0.154	0.097	0.096	0.096

Notes: The table reports robustness checks to the results reported in table 5. Column (1) includes industry-year dummies and column (2) adds a corporate taxable income split to equation 5. Column (3) restricts the estimation range to firms with corporate taxable income within ±€15,000 of the kink, whereas the remaining columns use a range of ±€25,000. Column (4) uses a balanced panel of firms over 2009–2018. In column (5) the dependent variable is a dummy that equals one for any firm reporting taxable income within [−€1500,€500] of the kink at least twice over the time period it is observed. In column (6) it equals one if is taxable income is within [−€1500,€500] of the kink in year t and in $t-1$.