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Abstract

We examine the role of tax incentives, tax awareness, and complexity in tax evasion. We observe a specific type of tax evasion among business owners in Swedish administrative panel data, after the tax authority has approved all tax returns. For the period 2006–2009, approximately 5% of tax returns overstate a claimed dividend allowance. Tax awareness decreases and complexity increases the likelihood of misreporting. Our results indicate that some observed misreporting could be accidental, while some misreporting is deliberate tax evasion. We identify a positive and significant effect of tax rates on tax evasion, by exploiting a large kink in the tax schedule. The majority of misreporting cases remains undetected by the tax authority. Self-correction of tax evasion by taxpayers is the dominant type of detection.

JEL-Code: H260, H240, D140.

Keywords: tax evasion, tax compliance, tax enforcement, tax awareness, detection.

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1 Introduction

Taxpayers try to minimize tax liability through legal or illegal means. At the same time, tax authorities attempt to improve compliance, detect tax evasion, enforce tax rules, and close unintended loopholes for legal tax avoidance.[1] A growing literature emphasizes tax awareness as an explanation as to why some taxpayers engage in legal tax avoidance activities while others do not. Taxpayer awareness of tax rules depends on the salience of taxes (Chetty, Looney, and Kroft, 2009; Finkelstein, 2009). Slowness in adaption to changing income levels or procrastination may also explain why not all individuals respond to tax incentives (Jones, 2012; Kopczuk, 2012). Further, the ability to process available tax information varies across individuals and depends on the flow of information through informal networks (Alstadsæter, Kopczuk, and Telle, 2012; Chetty, Friedman, and Saez, 2013; Alstadsæter and Jacob, 2013). These arguments also explain why we observe less illegal tax evasion than we would expect from standard economic models. Kleven, Knudsen, Kreiner, Pedersen, and Saez (2011) show that not everyone with access to tax evasion opportunities actually chooses to participate in such activity. Non-pecuniary factors such as moral disposition, norms, social conscience, and attitudes towards government all play a role in explaining non-participation in tax evasion (Andreoni, Erard, and Feinstein, 1998; Slemrod, 2003; Sandmo, 2005, 2012).

While most of these arguments relate to the conscious decision to evade taxes, some taxpayers may accidently file erroneous tax returns. Complexity of the tax system can increase unintentional as well as intentional non-compliance (Kopczuk, 2006; Slemrod, 2007). The design of the tax return form can induce non-compliance if taxpayers have difficulty understanding the information provided and asked for in the form. At the same time, taxpayers may deliberately take advantage of complex rules and tax forms if they perceive a low probability of detection. Therefore, organization of the tax administration and strength of tax enforcement additionally affect non-compliance by taxpayers. For example, if control routines of tax authorities are not adjusted following a tax reform that changes incentives, neither accidental nor intended tax evasion may be detected. This study examines the effects of complexity, tax awareness, and tax incentives on tax evasion.

The general challenge of any empirical study on tax evasion is the lack of appropriate data and an unobservable dependent variable. When using administrative data, the extent of tax evasion is unknown, since tax evasion is defined as the difference between true and (under-)reported income. In contrast to other studies (e.g., Clotfelter, 1983; Feinstein, 1991; Kleven, Knudsen, Kreiner, Pedersen, and Saez, 2011), we have a unique setting to empirically study tax evasion and non-compliance. We directly observe systematic errors in tax returns of business owners after the tax authority has approved the tax returns. By merging information across taxpayers and across

[1] In practice there is a blurry line between legal tax avoidance and illegal tax evasion, due to unclear regulations, lack of enforcement, and tax agencies' focus on particular types of transactions (Slemrod and Yitzhaki, 2002).

corporate and individual tax returns, we are able to uncover a specific type of tax evasion in administrative data.

We use a large Swedish micro-panel data set for the years 2006–2009 with information on income, tax rates, and other socioeconomic variables for individuals. This panel covers the population of all tax returns of all active Swedish closely held corporation (CHC) owners, including the corresponding corporate tax returns.[2] The advantage of our tax evasion measure is that the extent of evasion is observable. We define tax evasion as the difference between a claimed allowance, which is observed in the data, and the legal maximum allowance, which is defined in the tax code. More specifically, we are interested in the dividend allowance, which determines the amount of dividends from a CHC that active owners may receive at a preferential tax rate. This dividend allowance is defined as a fixed lump-sum per firm in a fiscal year.[3] The allowance is allocated across owners according to their share in equity. As the dividend allowance is claimed by each shareholder individually, shareholders in a CHC with more than one owner can claim outright a dividend allowance above their actual share. By overstating this dividend allowance, taxpayers attempt to illegally reclassify labor income as dividend income to reduce the total tax burden.

Over our sample period, approximately 5% of active owners overstate their dividend allowance and, consequently, evade taxes. However, since 60% of individuals overstating the dividend allowance do not generate tax benefits from such overstatement (based on current tax status), some of the tax evasion observed on the tax return data appears to be accidental. That is, some observed misreporting is due to accidental mistakes and some is due to intended tax evasion. Both cases are treated as tax evasion under Swedish tax law. Both accidental and intentional tax evasion lead to penalties if detected and if the evasion generates a tax benefit in the current tax year. In contrast, if there is no dividend payout in the year of overstatement and detection, the authority does not impose a penalty.[4] The tax authority treats this case as evasion but simply corrects the "mistake." The taxpayer's advantage from the latter treatment of tax evasion is that an overstated and undetected dividend allowance in a year without a dividend payout can be carried forward with interest. This is a valuable option on future tax savings, as dividends of private, and in particular of closely held firms, are very flexible and are paid out irregularly (Jacob and Alstadsæter, 2013). The Swedish tax administration did not systematically control for this type of tax evasion in the past. The tax authority does not merge information across shareholders to test if owners jointly claim a dividend allowance above the legal maximum per firm.

[2]CHCs form the one of the most important organizational forms in Sweden. About 60% of all Swedish corporations are treated as CHCs.

[3]This allowance is used by 80% of CHC owners. Owners can choose an alternative calculation method, where the dividend allowance depends on equity and wages paid by the corporation.

[4]In other jurisdictions, accidental and unintended tax evasion, i.e., negligence, usually yields lower penalties than intentional tax evasion, i.e., tax fraud. For example, the Internal Revenue Service (IRS) imposes fines of up to 20% on accidental tax evasion while tax fraud can lead to a fine of up to 75%.

We are interested in three questions. First, who overstates the dividend allowance and what characteristics increase the likelihood of evading taxes? Second, is overstating the dividend allowance driven by the tax benefit from re-classifying labor income as dividend income? Third, what drives the dynamics of detecting the overstated dividend allowance?

We first develop a simple model of overstating the dividend allowance with endogenous probability of detection and a risk-neutral taxpayer based on the tax evasion model of Allingham and Sandmo (1972) and Kleven, Knudsen, Kreiner, Pedersen, and Saez (2011). Our model shows that if the tax rate on dividends is below the tax rate on labor income, overstating the dividend allowance can increase net-of-tax income. Overstating the dividend allowance for each owner is limited to the maximum per firm, as the probability of detection becomes 1 above the maximum. Our model predicts that if an individual expects the dividend tax rate to be below the tax rate on labor income, he overstates the dividend allowance up to the legal maximum. In contrast, if the tax rate on dividends is expected to be above the tax rate on labor income, overstating the dividend allowance and paying out dividends reduces net-of-tax income and would be irrational.

We empirically test the effect of firm-level and individual-level characteristics on the probability of evading taxes. Our results suggest that the likelihood that a taxpayer overstates the dividend allowance is affected by tax complexity and tax awareness. For example, the likelihood of overstating the dividend allowance increases with the number of owners per firm, with the number of firms an individual owns, and whether owners live in different municipalities. In contrast, paying out dividends reduces the likelihood of overstating the dividend allowance, as it raises awareness of the level of the dividend allowance, increasing the probability of detection. Variables related to awareness and financial literacy, such as higher education, being born in Sweden, and income, reduce the probability of evading taxes. We also control for the purpose of the firm. Alstadsæter and Jacob (2013) show that some CHC types, such as holding, shell, and low-turnover corporations, are used for legal tax avoidance. We find that the probability of overstating the dividend allowance is lower if the firm is used for legal tax sheltering. This finding indicates that illegal tax evasion and legal tax avoidance are not used as complementary methods of tax minimization.

Second, we use an alternative identification strategy to test the effect of tax rates on tax evasion. The Swedish tax rate schedule, with its large kink, offers a suitable setting for identifying the predicted effect of tax rates on tax evasion in our model. If an individual is subject to an additional surtax of 20% on labor income, the dividend tax rate is below the income tax rate on labor income. This tax wedge creates an incentive to overstate the dividend allowance. If the individual is not subject to the state tax, the individual has no tax incentive to reclassify labor income as dividend income and to overstate the dividend allowance. That is, around the cutoff point of the state tax, the incentive to evade taxes changes. To identify the tax rate effect, we use local linear regressions with very narrow ranges of SEK 1,000 and SEK 500 (about USD 136 and USD 68) around this kink. As observable characteristics are smooth around the kink, the

identification stems only from differences in the tax rate. We find that crossing state tax threshold increases the likelihood of overstating the dividend allowance by 2.0 percentage points, or about 40% of the unconditional sample mean. We characterize this as intentional tax evasion, since the decision to evade taxes is driven by the tax advantage. We find that this tax rate effect, i.e., deliberate tax evasion, is stronger for less complex tax returns. In contrast, individuals with more complex tax returns do not respond to the tax incentive. Taken together, our findings suggest that complexity and lack of awareness can result in accidental tax evasion, while tax benefits explain intentional tax evasion behavior.

Finally, we analyze the dynamics of detection. We distinguish two cases in the data. First, the taxpayer changes behavior and complies with the tax rules after having overstated the dividend allowance for some years. Second, the tax authority detects evasion and automatically corrects prior-year outrightly claimed dividend allowances. Surprisingly, about 70% of the mistakes are corrected by the taxpayer. Only 30% are corrected by the tax administration. This observation relates to the importance of changing enforcement and control strategies following implementation of new tax rules. We use a competing risks proportional hazards model to analyze the dynamics of detecting the overstated dividend allowance, either by the taxpayer or by the tax authority. Our results suggest that complexity in compliance increases time until detection. If a firm has many owners, it requires more effort to coordinate both the preparation of tax returns and their audit. However, our results indicate that only a few factors explain self-correction and external detection of overstated dividend allowances.

Our results relate to the literature on tax enforcement strategies and the quality of tax compliance in general (e.g., Sánchez and Sobel, 1993; Chander and Wilde, 1998; Boadway and Sato, 2009; Alm, Jackson, and McKee, 2009; Bigio and Zilberman, 2011). Our findings have four main implications. First, economic models of tax evasion and avoidance should acknowledge that tax administration, enforcement strategies, and the design of the tax return form can affect participation in non-compliance and the level of tax evasion. Second, when designing tax reforms that change incentives for taxpayers, policy makers should also adjust enforcement and audit strategies. Third, to implement effective control and compliance strategies, tax authorities need to merge information across taxpayers and use automated, computer-based plausibility checks. Fourth, some of the observed tax evasion observed in this paper appears to be accidental. Complex tax rules and tax forms can trigger unintended tax evasion if mistakes stem from lack of tax awareness and slowness to adapt to new rules.

Our results also point toward more general challenges in complying with rules, norms, and forms. Business owners and corporations need to comply with employee health insurance requirements, environmental standards, and tariff regulations. All these non-tax regulations change over time and are vulnerable to accidental as well as intentional non-compliance.

2 Institutional Background

2.1 The Swedish tax system and tax treatment of CHCs

Sweden has a dual income tax, with a progressive tax on labor income and a proportional tax on capital income. Progressivity in the tax on labor income is achieved through a municipality tax (on average 31.5%) and two levels of state taxes of 20% and 5%, which apply at different thresholds. In addition, social security contributions apply to all wage payments and are remitted by the employer. These contributions generate substantial benefits, such as health care, unemployment payments, and future pensions. Above a certain threshold, social security contributions stop generating benefits (see Column 4, Table 1). We thus consider these contributions as insurance and benefit contributions, rather than as a tax below this threshold; we consider them as a tax above the cutoff. Table 1 provides an overview of marginal tax rates and thresholds for the two levels of state taxes and social security contributions for our sample period, 2006–2009.

[Insert Table 1 about here]

Table 1 also shows the combined dividend tax rate (τ_d), which consists of the corporate income tax of 28% (26.3% in 2009) and the dividend tax rate for CHCs at the individual level of 20%. The difference between the marginal tax rates on labor and capital income creates incentives for individuals subject to the state tax to reclassify wage income as dividend income. Alstadsæter and Jacob (2013) show that informed, highly taxed individuals establish CHCs with low turnover to legally benefit from the tax rate difference between τ_d and τ_i. If earned income is below the threshold for the first-level state tax (Column 2, Table 1), τ_i is below τ_d. That is, labor income is taxed at lower rates than dividend income. As soon as earned income is subject to the first level of the state tax, the combined tax rate on dividends is below the labor income tax rate ($\tau_i > \tau_d$), and individuals then have an incentive to reclassify labor income as dividend income.

To reduce this type of income shifting by firm owners, the Swedish government implemented the so-called 3:12 rules for active owners[5] of CHCs.[6] The purpose of these rules is to prevent income shifting from the labor income tax base to the capital income tax base by owner-managers. According to the 3:12 rules, dividends within an imputed dividend allowance are treated as dividends for tax purposes. Dividends in excess of the dividend allowance are taxed as labor income. The dividend allowance is a function of equity and wage costs of the corporation (general rule).[7]

[5] According to Swedish tax law, a shareholder is deemed active if the shareholder contributes to profit generation in the firm to a *considerable extent*.

[6] The tax law defines a corporation as closely held if four or fewer shareholders own at least 50% of the shares. Multiple family members count as a single shareholder. Therefore, few firms have more than four owners. If these criteria are not met, the corporation is considered to be widely held. There are no differences in corporate taxation between widely and CHCs. Dividends from unlisted widely held corporations have been taxed at 25% since 2006.

[7] The general rule defines the dividend allowance as a fixed interest on nominal equity (around 11%) and a fixed percentage of wages (25% or 50%) paid by the corporation to its employees. A more detailed description of the 3:12 rules and Swedish tax rates is found in Alstadsæter and Jacob (2012).

The allowance is calculated by each shareholder for each firm. In case of multiple owners, the dividend allowance is allocated across active shareholders according to the ownership share in the corporation. Any unused dividend allowances are carried forward with interest at the shareholder level, to be utilized on future dividends from the same corporation. In 2006, the 3:12 rules were reformulated to foster entrepreneurship and growth of CHCs. The reform included a reduction in the dividend tax rate from 30% to 20%, an increase in the dividend allowance from the general rule, and an introduction of an optional, fixed dividend allowance per corporation (the Simplification Rule—*Förenklingsregeln*).

2.2 Identifying misreporting

Each active shareholder in a CHC must file a K10-form. The K10-form is a four page document with which each shareholder calculates the dividend allowance for their particular corporation.[8] The K10-form is often filled out by the owner-manager.[9] The active owner chooses the calculation method for imputing the dividend allowance under the 3:12 rules. That is, the active owner chooses either the general rule or the simplification rule. We focus on the simplification rule and on tax evasion through overstating this lump-sum allowance. One reason behind implementation of this rule was to simplify compliance. The dividend allowance, according to the simplification rule, is independent of activity, equity, and employment in the firm. Approximately 80% of active owners under the 3:12 rules choose the simplification rule to calculate dividend allowance. These taxpayers fill out only the first page of the form.[10]

Each active shareholder is entitled to a share of the fixed dividend allowance in accordance with that shareholder's ownership share in the CHC. Around the introduction of the new tax form in 2006, which includes the new simplification rule, there was an ongoing process of reducing the number of entries in tax forms and of simplifying compliance. As a result, the shareholder is not asked to report actual ownership share on the K10-form. Instead, the shareholder declares only the resulting dividend allowance, $\mathbf{X}$, according to the following simple calculation (2006 value, 1 USD $\approx$ 7 SEK).

$$(SEK64,950) \times \frac{\text{(Number of own shares)}}{\text{(Number of total shares in the corporation)}} = \mathbf{X}.$$

[8]The K10-form is available at the homepage of the Swedish tax authority (in Swedish for 2009, retrieved August, 2013.): http://www.skatteverket.se/download/18.6d02084411db6e252fe80001510/211020.pdf.

[9]We are, unfortunately, not able to observe whether a tax consultant assisted in the preparation of a tax return. Owners of very large CHCs are likely to have tax consultants. In our empirical model, we include firm size to control for this effect.

[10]In case a taxpayer fills out both methods, the tax authority chooses the method that results in the higher dividend allowance. We follow this approach when identifying whether a taxpayer uses the simplification rule.

Figure 1 shows the corresponding excerpt from the K10-form of the simplification rule for fiscal year 2006. This is the first line in the K10-form. The taxpayer fills in field 410 (**X**) without explicitly stating ownership share.

[Insert Figure 1 about here]

While this appears fairly straightforward, it does require some minimum level of mathematical and cognitive ability. There are several potential sources of error in the case of multiple active firm owners. Let us consider an active shareholder who owns 50% of CHC equity. Instead of the shareholder's actual 50% share of the dividend allowance (SEK 32,475 in year 2006), the shareholder could fill in the maximum annual fixed dividend allowance (SEK 64,950 in year 2006). Since there is no shareholder register for CHCs or third-party reporting of ownership structure of privately held corporations in Sweden, the tax authority is not able to cross-check implied ownership share with an external source. Further, the tax authority apparently does not systematically merge information across shareholders to check whether shareholders in a CHC jointly claim more than the legal maximum per firm. As a result, taxpayers are able to overstate the dividend allowance.

Overstating the dividend allowance is regarded as tax evasion by Swedish tax law, but the consequences depend on the tax benefits. If the overstated dividend allowance leads to a tax reduction in the current year, and if the overstated dividend allowance is detected (e.g., through our detection strategy), the Swedish tax authority imposes a penalty. However, if there is no dividend payout in the year of overstatement and detection, the authority does not impose a penalty. The tax authority simply corrects the "mistake." The taxpayer's advantage from the latter approach toward tax evasion is that the overstated dividend allowance can be carried forward with interest and can be utilized when dividends are paid out in later years. This option is valuable, since dividends of private, in particular CHCs, are very flexible and are paid out irregularly (Jacob and Alstadsæter, 2013). The possibility of accumulating and forwarding unused dividend allowances represents an option to generate future tax savings, even if they generate no tax saving in the present period. By overstating the dividend allowance in the present period, the taxpayer reduces the present or future tax burden, depending on when (and whether) dividends are distributed to the active owner. This type of tax evasion can therefore more or less be carried out without risk of penalty.

We illustrate the effect of overstating dividend allowance in Table 2. We consider an individual with an ownership share of 50%. Columns (2) through (4) show the tax evasion case for overstating the dividend allowance. Columns (5) through (8) show the correct reporting. In case of evasion, the taxpayer effectively doubles the dividend allowance. The potential tax benefits are substantial. Consider a taxpayer who is in the top marginal tax bracket and subject to an income tax of 56.6%. If such taxpayer receives a dividend (after corporate taxes) of SEK 396,717, the dividend tax burden equals SEK 79,343 (=396,717×20%). In the case of correct reporting, only half the

dividend payment is treated as dividends. The remaining portion of the dividend is taxed as labor income but is not subject to social security contributions. This leads to a total tax burden of SEK 151,942 (=198,358×20% + 198,358×56.6%). Overstating the dividend allowance can thus have a substantial impact on the tax burden of individuals.

[Insert Table 2 here]

2.3 Detection and correction of overstated dividend allowance

The Swedish tax administration is organized under eight income tax regions with numerous tax offices in each. Each tax office covers on average 3 to 4 of the 290 Swedish municipalities. Tax audit decisions are centralized at the national level. The selected tax returns are then distributed to the relevant local tax offices, where the audits are carried out. Over our sample period, there is no automatic control routine at the national level prior to audit assignments to check whether the jointly claimed dividend allowance of all shareholders per firm exceeds the maximum allowance. This may explain why not all over-reported dividend allowances are detected.

We observe two ways of detecting and correcting the overstated dividend allowance in the data. If a shareholder who overstates the prior year's dividend allowance (year *t-1*) reports the allowance correctly in year t with no changes to the accumulated dividend allowance, we label this as *Self-Correction*. That is, the shareholder changes behavior but retains the outrightly claimed dividend allowance from prior years. Columns (2) through (4), Table 3 show an example where overstating the dividend allowance is self-detected in 2008. In 2008, the correct amount of SEK 45,900 (=50% ×91,800) is declared. The overstated dividend allowances (in total SEK 158,198 in 2007) of the preceding years are not corrected. The taxpayer corrects the reporting on the taxpayer's own initiative without consulting the tax administration.

In Columns (5) through (7), Table 3, we show cases that we label *External Correction*. In these cases, the active owner who previously over-reported the dividend allowance also begins reporting it correctly in year t. However, the accumulated dividend allowance from the previous year decreases by the prior year overstated dividend allowance.[11] If an auditor from the Swedish tax authority detects the overstated dividend allowance or is actively involved in the correction process, for example, in cases of amended tax returns, the auditor ultimately corrects the overstated dividend allowance of the current and preceding year. This is how we distinguish between self-correction and external correction. However, adjustment of previously overstated dividend allowances does not go back two or more years in the data. In our case, the difference in accumulated dividend allowances between self-correction and external detection amounts to SEK 47,686 (= 169,525−121,839).

[Insert Table 3 here]

[11] When identifying overstatement of the dividend allowance, self-correction, and external correction, we take into account any dividend payments that reduce the dividend allowance.

Note that we may underestimate tax evasion in the data. We have information only on active owners of CHCs. As long as active owners claim a total dividend allowance that is not above the legal maximum, we define this as correct reporting. However, if there is a (are) passive owner(s) in this corporation, active owners should claim less than the maximum allowed dividend allowance. We are not able to identify this in the data, as there is no shareholder register and no third-party reporting of ownership structure of privately held corporations in Sweden.

3 A simple model for overstating dividend allowance

We formalize our predictions about the tax rate effect on tax evasion in a simple model. This model is based on the Allingham and Sandmo (1972) model. We assume risk-neutral taxpayers who maximize expected income in the presence of an endogenous detection probability (Kleven, Knudsen, Kreiner, Pedersen, and Saez, 2011).[12] In contrast to the standard approach in modeling tax evasion by under-reporting true income, our measure of tax evasion refers to overstating the dividend allowance. This allowance defines the portion of dividend income that is to be taxed at a proportional dividend tax rate rather than a progressive tax rate on wage income. If dividends are taxed at a lower rate than wage income, taxes are illegally minimized. However, it could well be that individuals face an increase in tax burden if they accidently overstate the dividend allowance in cases where the marginal labor income tax rate is below the dividend tax rate. Kleven, Knudsen, Kreiner, Pedersen, and Saez (2011), for example, find that some taxpayers overstate true income on their tax returns.

In our model, we first consider a taxpayer with true income $\bar{y}$ that is equal to his taxable reported income y. We adjust the model to facilitate the dual income tax. A part α of the income is subject to the income tax rate τ_i. The remaining portion $(1-\alpha)$ is subject to the dividend tax rate τ_d. We define the effective overall tax rate on $\bar{y}$ as $\tau_e = \alpha \cdot \tau_i + (1-\alpha) \cdot \tau_d$. The taxpayer can overstate the dividend allowance by e. Overstating the dividend allowance by e does not affect total income $\bar{y}$, but leads to a change in the tax burden of $e \cdot (\tau_d - \tau_i) = e \cdot \Delta\tau$. Depending on the relation between dividend taxes and income taxes, overstating the dividend allowance can reduce or increase the overall tax burden.

With probability p, the tax authority detects the overstated dividend allowance. We assume that, in case of detection, the dividend allowance is fully adjusted. We assume that the probability of detection is increasing in the overstated dividend allowance. For example, as the individual benefits of overstating the dividend allowance increase with the number of owners, the likelihood of being detected increases when more owners participate in tax evasion. If the tax authority exposes the tax evasion of one owner, it checks the tax returns of the other owners as well. Since

[12] See Sandmo (2005, 2012) for thorough literature overviews on tax evasion as a portfolio choice, following the seminal Allingham and Sandmo (1972).

the dividend allowance is capped at the firm level (see Column 1, Table 2), any overstatement of the dividend allowance above this cap, denoted as $\bar{e}$, in one tax return is ultimately detected. Hence, $p(e)$ is a non-monotonic function that we define as $p = p(e)$ with $p'(e) \geq 0$ and $p''(e) \geq 0$ if $0 \leq e \leq \bar{e}$ and $p(e) = 1$ if $e > \bar{e}$. Put differently, so long as the claimed dividend allowance in one tax return does not exceed the legal maximum, the probability of detection is below 1. If, however, the claimed dividend allowance in one K10-form exceeds the annual limit per firm, the probability of detection is 1. Empirically, we observe no case where a taxpayer successfully claimed more than $\bar{e}$. Therefore, the ability to evade taxes depends on the number of owners of a firm. Not everyone who may be willing to cheat has the ability to do so (see also Kleven, Knudsen, Kreiner, Pedersen, and Saez, 2011). Only owners of firms with multiple owners have access to this type of tax evasion and are able to overstate their share of the dividend allowance to the maximum per firm.

If an overstated dividend allowance is detected, the Swedish tax authority corrects the calculated dividend allowance but does not necessarily impose a penalty.[13] In case no dividends are paid out, there is no penalty. Therefore, we simplify our model and assume that individuals do not pay out dividends in the year of overstatement. In this case, $\Delta\tau$ represents the present value of the expected change in the deferred dividend tax burden. While this reduces the present value of evasion, it does not alter the sign of $\Delta\tau$, which depends on expected tax rates. The risk-neutral taxpayer maximizes the following expected net-of-tax income:

$$\begin{aligned} u &= (1 - p(e)) \cdot [\bar{y} \cdot (1 - \tau_e) + e \cdot \Delta\tau] + p(e) \cdot [\bar{y} \cdot (1 - \tau_e)] && if\ 0 \leq e \leq \bar{e} \\ u &= \bar{y} \cdot (1 - \tau_e) && if\ e > \bar{e} \end{aligned} \tag{1}$$

We are interested in the first case. That is, the dividend allowance can be overstated with some probability that evasion remains undetected. The first term corresponds to net-of-tax income in case the overstatement is not detected. The second term represents net-of-tax income if evasion is detected. The first derivative of the net-of-tax income with respect to overstatement e is:

$$\frac{\partial u}{\partial e} = \Delta\tau \cdot [1 - e \cdot p'(e) - p(e)] \qquad if\ 0 \leq e \leq \bar{e} \tag{2}$$

If $\Delta\tau > 0$ and $1 - e \cdot p'(e) - p(e) > 0$, an increase in e increases the expected net-of-tax income, that is, $\frac{\partial u}{\partial e} > 0$. Our simple model predicts that individuals should overstate the dividend allowance if the expected dividend tax exceeds the expected income tax on earned income up to the level of $\bar{e}$ and if the probability of detection is low. If $\Delta\tau < 0$, any overstatement of the dividend allowance reduces net-of-tax income when dividends are paid out. Hence, tax evasion in the form

[13] Niepelt (2005) presents an extended version of the Allingham-Sandmo model that allows for duration-dependent fines. While this could be of interest with respect to the problem presented in this paper, as individuals accumulate overstated dividend allowances over several periods, the Swedish tax authority does not impose duration-dependent fines in practice. If at all, a potential fine depends only on the current overstated dividend allowance.

of overstating the dividend allowance is very likely to be accidental. However, there are two potential problems with this conclusion. First, the model uses current tax status. Since we assume a case where the dividend payout is in later periods, our prediction should be based on *expected* rather than *current* tax status. That is, our model prediction relates to the uncertain future tax rate difference $\Delta\tilde{\tau}$. Second, individuals with $\Delta\tilde{\tau} < 0$ may also overstate the dividend allowance, as it represents an option on future tax savings; individuals decide on the real dividend-wage-mix through their payout behavior.

From our model, we formulate a simple prediction for the effect of tax rates on tax evasion, which we test empirically. The sign of $\Delta\tau$ depends on the expected relation of τ_d to τ_i. The advantage of our setting is that $\tau_i < \tau_d$ if the individual is subject to the municipality tax. If an individual is additionally subject to the state tax, $\tau_i > \tau_d$ and $\Delta\tau$ become positive. Empirically, we expect that the likelihood of overstating the dividend allowance is higher for taxpayers that are subject to the state tax.

4 Data sample, variable definitions, and estimation strategy

4.1 Data

We use the Firm Register and Individual Database (FRIDA) provided by Statistics Sweden. This panel data set is a combination of three main data sources: corporate tax statements, income tax statements, and the K10-form for owners of closely held firms. The corporate and individual data sets are full samples of all CHCs and their active owners. Individual data contain information on income and other socioeconomic variables. Due to unique identifiers, we can link information from the individual database and the corporate tax database to the population of K10-forms filed in the period 2006–2009. We include all observations where we can successfully link information from the corporation (from the corporate tax database) and the individual (from the individual tax database) to the respective K10-form. The final sample consists of 574,030 observations (K10-forms) from 163,097 CHCs and 213,380 individuals over the period 2006–2009.

4.2 Identifying tax evasion in the data

We use a simple algorithm to detect overstated dividend allowances. We compute the claimed dividend allowance for firm j in year t using the simplification rule. We do so by summing up the claimed dividend allowances by all active owners of one firm. If the total claimed dividend allowance exceeds the maximum per firm, we flag each owner as having overstated the dividend allowance and set the dummy variable *Failure* to 1. This classification follows Swedish tax laws, according to which these cases are treated as tax evasion. If the claimed dividend allowance per firm does not exceed the maximum per firm, we set *Failure* to zero.

There are several concerns about this measure, as we treat every owner as a tax evader. It could be that only one of the shareholders overstates the dividend allowance, e.g., by claiming the maximum for himself. As a robustness test, we re-run all tests using an alternative definition where we set the dummy to 1 if the total claimed dividend allowance exceeds the maximum per firm *and* if the owner claims the legal maximum for himself.[14] However, we use *Failure* throughout the paper, since owners can overstate the dividend allowance without claiming the full allowance. For example, we observe cases where two owners each claim 75% of the dividend allowance. The alternative and stricter definition ignores this case. Most importantly, results for this alternative definition are similar to the results when using *Failure*.

We observe overstated dividend allowances (*Failure* = 1) in about 5% of the filed K10-forms.[15] The overstated dividend allowances amount to approximately SEK 3.3 bn. This is a non-trivial amount, as it does not take into account that the outrightly claimed dividend allowances can be carried forward with interest rates of about 7% to 8%. Figure 2 plots the distribution of claimed dividend allowances per firm relative to the legal maximum. For example, a value of 2 indicates that a firm has claimed 200% of $\bar{e}$. We plot the distribution for each sample year. We find that misreporting is highest in the year of introduction of the new rule. Thereafter, tax authorities and/or taxpayers adapt to the new rules. Misreporting decreases but is still present. This is a first indication of inertia in the adoption of the new rules. The spikes in the distribution at the values of 1.5, 2, 3, 4, and 5 indicate that the majority of misreporting is due to firms with multiple owners, where each owner claims the full annual dividend allowance per firm without coordinating dividend allowances across owners.

[Insert Figure 2 about here]

4.3 Estimation strategy

4.3.1 Likelihood of overstating dividend allowance

We test the implications our theoretical considerations using a linear probability model that contrasts the likelihood of evading taxes by overstating the dividend allowance against correct statement of the dividend allowance.[16] We specify the regression model as

$$y_{i,j,t} = \alpha_1 + \delta \mathbf{\Pi}_{j,t} + \gamma \mathbf{\Theta}_{i,t} + \alpha_t + \alpha_c + \epsilon_{j,t} \tag{3}$$

[14] Results using this alternative dependent variable are presented in Tables A.1 through A.4 in the Appendix.

[15] Taxpayers may also underreport the dividend allowance. We are, unfortunately, not able to observe this, because we do not know the true share due to lack of a shareholder register. However, as mentioned above, the dividend allowance represents an option to pay out dividends; this option may or may not be utilized.

[16] We run additional sensitivity tests and re-estimate the model using a probit model. Results (not reported) are very similar.

where the dependent variable $y_{i,j,t}$ is an indicator variable for individual i, firm j measured in year t, taking the value 1 if the dividend allowance is overstated, i.e., if individual i evades taxes, and 0 otherwise (*Failure*). We use a set of firm-level and individual-level control variables that are related to the incentive to evade taxes, awareness of tax rules, complexity of tax compliance, and probability of detection.

The vector $\mathbf{\Pi}_{j,t}$ contains firm-level characteristics of firm j in year t. First, we include the number of active owners (*Number Owners*).[17] The expected effect of number of owners is ambiguous. If a firm is owned by many active owners, costs of coordination and of tax compliance increase. The effect of *Number Owners* is further related to incentives, since the marginal benefit for one owner increases with the number of owners. Both arguments would predict a positive sign. At the same time, it is more difficult to collude with larger numbers of owners, which suggests a negative effect. Second, we include a dummy variable indicating whether owners of a closely held firm live in different states (*Different Region*). This variables is a proxy for complexity and relates to the costs of coordination across firm owners. If firm owners reside in various states, costs of coordination increase and the likelihood of over-reporting should also increase. Third, we include age of the firm (*Firm_Age*) as a measure for inertia and slowness of adoption (Jones, 2012). Owners of well-established firms may have greater difficulty in adapting to new rules than individuals starting a new firm. In contrast, firm age could also decrease over-reporting of dividend allowances, since the owners are more experienced in filing tax returns. Fourth, we include a dummy variable *Dividend Payout*, equal to 1 if the CHC pays out a dividend in year t. We expect that paying out dividends reduces the likelihood of overstating the dividend allowance, for two reasons. First, it raises taxpayer's awareness of calculation of the dividend allowance. Second, the probability of detection increases as the tax administration more closely considers cases where dividends are paid out.[18] Fifth, we include the natural logarithm of total assets (*Ln(Assets)*) as a measure of firm size. Since we have no information on tax advisers, we use firm size as a control for tax advice. We expect that smaller firms are more likely to overstate the dividend allowance, since larger firms are more likely to have a tax consultant. Sixth, we include the profitability measure *Return on Equity*. The return to tax evasion is higher for profitable firms, since more profits are to be distributed. Such firms have an incentive to overstate the dividend allowance. In contrast, we could observe the opposite effect. Less profitable firms may have incentives to increase net-of-tax return of their company by illegal means. We therefore additionally include a squared term of *Return on Equity* in the regression and expect a positive sign for the squared term. Seventh, we use the ratio of

[17] One concern about *Number Owners* is that only firms with more than one active owner have access to over-reporting the dividend allowance. As a robustness test, we re-run equation (3) where we focus on firms with more than two owners. Results are reported in Table A.5 and are qualitative similar.

[18] While one would expect that calculation of the dividend allowance is always thoroughly checked by the tax administration when dividends are paid out, we find no empirical support for this expectation. The tax authority apparently does not automatically audit calculation of the dividend allowance when dividends are paid out. We observe cases where outrightly claimed dividend allowances are utilized by taxpayers.

financial assets and cash holdings to total firm assets (*Financial Assets*) as a measure of passive firms. Finally, we include *Shifter CHC*, a dummy variable indicating whether the firm is a holding, shell, or low-turnover corporation. These three firm types facilitate legal tax avoidance following the 2006 tax reform (Alstadsæter and Jacob, 2013). The sign of Shifter CHC indicates whether illegal tax avoidance and legal tax evasion are substitutes or complements.

The vector $\mathbf{\Theta}_{i,t}$ contains controls for characteristics of individual i in year t. We include the number of firms (*Number Firms*) in which the taxpayer actively participates. Number of firms is an individual-level control for complexity in compliance. At the same time, number of firms is positively related to experience in tax compliance. Second, we control for tax incentive. For example, Clotfelter (1983); Feinstein (1991); Hanlon, Maydew, and Thornock (2013) document a positive relation between tax rates and tax evasion. In our sample, we measure tax incentive through the dummy *State Tax*, equal to 1 if the individual is subject to state tax. In this case, the current dividend tax rate τ_d is below the current income tax rate on labor income τ_i and $\Delta\tau$ becomes positive. According to our model, we expect a positive effect from the state tax dummy on overstating the dividend allowance. We additionally include an interaction between the number of owners and $\Delta\tau$. If *Number Owners* is related to the incentive to overstate the dividend allowance, we should obtain a positive coefficient for the interaction term. Third, we include dummy variables for each of the 10 deciles of the 3-year average income distribution to account for a non-linear relationship between income and tax evasion. Income comprises labor income, income from self-employment, income related to CHC, capital income such as dividends, interest, and capital gains, and any other taxable income. We additionally include variables related to tax awareness. If the observed type of tax evasion is unintended, tax-aware individuals are less likely to overstate the dividend allowance. In contrast, if an individual is not tax aware, the individual may accidently overstate the dividend allowance. As proxies for tax awareness, we include level of education, type of education, experience (measured through age), and a dummy *Born in Sweden*, equal to 1 if the individual was born in Sweden. K10-forms and detailed tax rule information are available only in Swedish. We thus expect that individuals who are born in Sweden understand available information more easily and predict that Swedish-born taxpayers have a lower probability of accidentally overstating the dividend allowance. The same applies for individuals with tertiary education.

As additional socioeconomic controls we include a dummy for being married and number of children in the household. We additionally include controls for gender and marital status, as well as year-fixed effects (α_t). We also include county-fixed effects (α_c) to account for regional differences across the 21 first-level administrative regions in Sweden.[19] Our statistical inference

[19] As a robustness test, we re-run the regression with shareholder-fixed effects. Results for time-varying variables, e.g., the tax incentive, are similar to the baseline model, which allows identification of time-invariant controls.

is based on heteroskedasticity-robust standard errors clustered at the individual level. Table 4 presents summary statistics and variable definitions for our sample.

[Insert Table 4 about here]

4.3.2 Identifying tax incentive—local linear regressions

The model from equation (3) includes the variable *State Tax* to test the effect of the tax wedge between dividend taxes and labor income taxes, $\Delta\tau$, on tax evasion. We use an alternative identification strategy to test the effect of tax rates on tax evasion. The Swedish tax rate schedule offers a suitable setting for testing the tax effect on tax evasion using a local linear regression. If an individual is subject to the additional state tax of 20%, the tax rate on dividends falls below the income tax rate on labor income. $\Delta\tau$ from equation (2) becomes positive and the individual has a tax incentive to overstate the dividend allowance. Below the threshold, $\Delta\tau$ is negative and there is no incentive to overstate the dividend allowance. We take advantage of this major kink in the tax code and the sign change in $\Delta\tau$. We run a local linear regression to empirically test the relation between evasion and tax rates. Since we use a very narrow range around the kink, the effect is not due to a large tax benefit, since the average tax rate changes little. The effect is more related to the salience of the kink to taxpayers (Chetty, Looney, and Kroft, 2009; Finkelstein, 2009). Below the kink, individuals pay municipality tax, whereas individuals above the kink pay municipality and state tax. For example, Alstadsæter and Jacob (2013) use this kink to identify a tax effect on legal income shifting. We follow their approach and run the following local linear regression:

$$y_{i,j,t} = \beta_1 + \beta_2 State\ Tax + \mu_{j,t} \tag{4}$$

$$y_{i,j,t} = \beta_1 + \beta_2 State\ Tax + \vartheta \mathbf{\Pi}_{j,t} + \xi \mathbf{\Theta}_{i,t} + \beta_t + \beta_c + \mu_{j,t} \tag{5}$$

where $y_{i,j,t}$ is an indicator variable taking the value 1 if individual i overstates the dividend allowance of firm j in year t, and 0 otherwise. We choose very narrow ranges of SEK 1,000 and SEK 500 (about USD 136 and USD 68) around the state tax threshold to ensure that there are no differences between individuals above and below the threshold in observable characteristics. In fact, we detect no statistically significant differences in all variables of vectors $\mathbf{\Pi}_{j,t}$ and $\mathbf{\Theta}_{i,t}$ for individuals above and below the threshold (see Table A.6 of the Appendix). We are mainly interested in the β_2 coefficient. According to our model, β_2 is expected to be positive. We test the model with and without control variables. The specification in equation (4) includes no control variables. In equation (5), we control for firm-level controls ($\mathbf{\Pi}_{j,t}$), individual-level controls ($\mathbf{\Theta}_{i,t}$), time (β_t), and county-fixed effects (β_c). If our identifying assumptions hold, we should not observe differences in the β_2 coefficients across the two equations.

We are additionally interested in the role of complexity in the effect of the tax incentive. For this purpose, we split the sample into firms with either two active owners (lower complexity) or

more than two active owners (higher complexity).[20] The complexity of tax compliance increases in the number of taxpayers who need to align their dividend allowances across tax returns. At the same time, more owners increase their tax benefits from overstating the dividend allowance. Using these cross-sectional differences in the number of owners, we test (1) whether the number of owners is related to complexity and, given that this is true, (2) whether complexity is related to intentional or accidental tax evasion. If taxpayers deliberately abuse complexity when evading taxes, the effect of crossing the cutoff for the state tax should increase in complexity. That is, the effect of $\Delta\tau$ should be larger in the high-complexity sample. In contrast, if complexity leads to unintentional tax evasion, the effect of tax rates on tax evasion should be more pronounced in the low-complexity sample. It is an empirical question as to which of these two effects dominates.

5 Empirical results on participation in tax evasion

5.1 Likelihood to overstate dividend allowance

Table 5 presents regression results for the OLS regression from equation (3). We present results for the firm-level variables ($\mathbf{\Pi}_{j,t}$), individual-level variables ($\mathbf{\Theta}_{i,t}$), and for the full set of independent variables. Our results suggest that the likelihood of overstating the dividend allowance is affected by complexity and the cost of coordination. The likelihood of tax evasion increases with the number of owners of a firm and whether the owners live in different regions. The effects we find are economically significant. For example, an increase in the number of active owners by 1 increases the likelihood of overstating the dividend allowance by 3.87 percentage points, or about 79% of the unconditional sample mean. In contrast, paying out dividends raises awareness of the potentially incorrect calculation of the dividend allowance. We find that the likelihood of overstating the dividend allowance decreases by 1.25 percentage points, or 25% of the unconditional mean, if a firm distributes dividends. We further find that the likelihood of overstating the allowance is higher for older as well as for smaller firms. We observe a significant effect of the squared term of return on equity. The resulting U-shape pattern for the return on equity effect reflects our expectation that the least profitable as well as the most profitable firms evade taxes. While less profitable firms may seek out illegal opportunities to increase net profits, owners of highly profitable firms may overstate the dividend allowance as they enjoy large benefits in the form of tax reductions. Finally, the negative coefficient of *Shifting CHC* indicates that owners of CHC that are designed for legal tax sheltering are less likely to also participate in illegal tax minimization. Being an owner of a CHC designed for tax avoidance reduces the likelihood of overstating the dividend allowance by 12%. This result indicates that tax evasion and tax avoidance are not used as complementary

[20] We use alternative sample split variables (number of firms, living in different regions). Results (reported in Table A.7 and A.8 of the Appendix) are qualitatively similar when using these alternative variables.

ways of minimizing taxes. Taxpayers who avoid taxes are less likely to evade taxes. Our results for the firm-level variables are not affected by inclusion of individual-level variables.

[Insert Table 5 about here]

We next turn to our individual-level variables. Our results suggest that variables related to complexity and awareness have a significant effect on the likelihood to overstate dividend allowance; for example, this likelihood increases with the number of firms. Even though experience with tax compliance increases with the number of firms, the complexity of tax compliance increases if an individual actively participates in many firms. Our results suggest that an increase in the number of firms by 1 increases the likelihood of overstating the dividend allowance by 0.28 percentage points. We find that tertiary education and being born in Sweden reduces the likelihood of tax evasion. For example, if an individual is born in Sweden, that individual has a 15% lower probability of evading taxes. Likewise, having a university degree reduces the probability of overstating the dividend allowance by 24%. This result indicates that tax-aware individuals are less likely to evade taxes. Further, we control for income, which is also related to tax awareness, financial literacy, and potential tax advice. Seven of nine of our income indicator variables are significant and have negative signs.

In line with our theoretical model, we find a positive estimate for the tax incentive coefficient (*State Tax*). This is a first indication that tax incentives positively affect tax evasion. However, the dummy *State Tax* is correlated with other variables, for example, our income decile indicator variables. Therefore, we use the alternative estimation strategy set forth below to estimate the effect of $\Delta\tau$ from our model on tax evasion. In Table 5, we further find that the interaction between *Number Owners* and *State Tax* is negative and significant. This indicates that the number of owners is more related to complexity than to increased potential tax benefits. Finally, it appears that there is a learning effect. The likelihood of overstating the dividend allowance decreases over time, as indicated by the decreasing year–dummy variables.

Taken together, it appears that at least some of the observed tax evasion can be explained by complexity and lack of awareness. Not all individuals who overstate the dividend allowance actually benefit from tax evasion. In fact, the overall tax burden could increase for individuals subject only to the municipality tax. Summary statistics (not reported) show that 60% of business owners who overstate the dividend allowance are currently not subject to the state tax ($\Delta\tau < 0$). Still, some of the observed tax evasion may be due to deliberate tax evasion. Otherwise, owners of highly profitable firms and owners subject to the state tax would not be more likely to overstate the dividend allowance.

5.2 Tax incentive and evasion: evidence from local linear regressions

This section presents an alternative identification strategy to analyze the relation between tax rates and tax evasion and the effect of complexity on intended tax evasion. If individuals respond to the tax incentive, we may interpret this as deliberate tax evasion. Taxpayers would only overstate the dividend allowance because of the tax benefit. Our model from Section 3 has a clear prediction: if the expected dividend tax is below the expected labor income tax, overstating the dividend allowance can increase net-of-tax income. To test this prediction, we use the state tax cutoff that increases the marginal labor income tax rate by 20% and that changes the sign of $\Delta\tau$. This approach has several advantages. First, since individuals above and below the threshold are statistically not different from each other in observable characteristics, the identification stems only from the difference in $\Delta\tau$. Second, the tax rate increase is salient. This increase is due to the state-level tax in addition to the municipality tax. While the actual tax benefit changes little around the kink, the increase in the marginal tax becomes quite salient. The cutoff, however, changes the marginal and not the average tax rate. Therefore, the increase in tax benefits is only marginal. A potential reaction to the increase in the marginal labor income tax rate may be explained by the salience of the tax cut or by taxpayer confusion of marginal with average tax rates (see, e.g., de Bartolome, 1995). Third, the threshold for the state tax changes each year. This time-series variation improves identification of the tax effect.

We generate empirical evidence on the effect of the increase in marginal tax rate on overstating the dividend allowance in two ways. We first provide graphical evidence. We sort the data into SEK 250 bins and calculate the percentage of CHC owners overstating the dividend allowance in each bin. Figure 3 shows the resulting percentages in each bin. The likelihood of overstating the dividend allowance decreases up to the state tax cutoff (indicated by the vertical line). Above the state tax threshold, the percentage of individuals overstating the dividend allowance increases.

[Insert Figure 3 about here]

Second, we quantify the effect of tax rates on tax evasion using local linear regressions around very narrow ranges of SEK 500 and SEK 1000 around the state tax threshold. Table 6 reports the coefficient of the state tax dummy without control variables (Columns 1 and 3) and with control variables (Columns 2 and 4).

[Insert Table 6 about here]

We find that crossing the state tax threshold significantly increases the likelihood of overstating the dividend allowance. Results are very similar for both ranges around the threshold. Crossing the state tax threshold increases the likelihood of overstating the dividend allowance by 2 percentage points—about 40% of the unconditional sample mean. Results are very similar when including

controls. This confirms that the sample is reasonably smooth around the kink, as coefficient estimates are not affected by inclusion of control variables, year-fixed effects, and county-fixed effects. Hence, some of the observed tax evasion is driven by the tax wedge between dividend taxes and labor income taxes. Individuals intentionally overstate the dividend allowance to benefit from lower dividend taxes as opposed to higher labor income taxes.

We are next interested in the role of complexity in intentional tax evasion. Since complex tax compliance reduces the probability of detection, taxpayers may deliberately take advantage of complex situations. In contrast, complexity in compliance may result in accidental tax evasion. We therefore split the sample into two groups that differ in complexity. In Table 7, we present coefficient estimates for *State Tax* from local linear regressions for CHCs with two owners (lower-complexity sample) and for CHCs with more than two owners (higher-complexity sample). Our results indicate that complexity is related to accidental tax evasion. If incentives explain the results of *Number Owners*, we would see a stronger effect of *State Tax* in the group of CHCs with more than two owners. We find a positive effect of crossing the state tax threshold only in the low-complexity sample. In the high-complexity sample, crossing the state tax threshold does not affect the probability of overstating the dividend allowance.

[Insert Table 7 about here]

We run robustness tests and use the number of firms an individual owns and whether the owners live in different states (*Different Regions*) as alternative proxies for complexity (Table A.7 and A.8 in the Appendix). Results are qualitatively similar. This robustness analysis also addresses concerns that *Number Owners* is additionally related to collusion. Owners of firms with many owners may not be able and willing to collude in tax evasion. In both robustness tests, we find a positive and significant effect only in the low-complexity group.

We conclude that some tax evasion is driven by the tax advantage of dividend income over labor income and tax awareness of the kink in the Swedish dual income tax. Individuals intentionally evade taxes once they have a tax incentive. Hence, not only legal tax avoidance (Alstadsæter and Jacob, 2013), but also tax evasion through overstating the dividend allowance is driven by tax incentives and tax awareness. Further, since one requires business partners for this type of tax evasion, this type of tax evasion is another example that not everyone who may be willing to cheat also has the ability to do so (Kleven, Knudsen, Kreiner, Pedersen, and Saez, 2011).

6 Self-correction versus external correction of tax evasion

6.1 Detection of tax evasion

We distinguish between two different types of detection, which we label self-correction and external correction, according to the legal consequences of detection by the tax administration (see above).

We set the indicator variable *Self-Correction* to 1 if the individual corrects the dividend allowance himself, zero otherwise. We treat a case as self-detection only if the accumulated overstated dividend allowance from past years is not corrected. If the accumulated dividend allowance from *t-1* is corrected as shown in Columns (5) to (7) of Table 3, we set *External Correction* to 1. *Self-Correction* and *External Correction* are mutually exclusive. Either the taxpayer or the tax authority detects the overstated dividend allowance.

Figure 4 summarizes the percentage of K10-forms with overstated dividend allowances in the preceding year and the percentage of cases detected. In 2007, about 40% of incorrect K10-forms from 2006 are corrected and now declared correctly. Surprisingly, 70% of these detected cases do not lead to a readjustment of the outrightly claimed dividend allowance. These cases are detected by taxpayers themselves without consequences. The remaining 30% are corrections by the tax authority. Overstating the dividend allowance is discovered by the authorities in only 12% (40% $\times$ 30%) of all evasion cases. This is a surprising result, as an automatic check across firm owners could have discovered all evasion cases.

Figure 4 also provides some first indications that the probability of detection with consequences (*External Correction*) decreases over time. First, the percentage of detected cases (self-corrected and externally detected) decreases from 40% in 2007 to 36.6% in 2009. Second, the share of external corrections decreases from 30% in 2007 and over 22% in 2008 to 20% in 2009. That is, only 7.23% of overstated dividend allowances are detected by tax authorities in 2009. In case of detection, the vast majority has no consequences on the accumulated dividend allowance; that is, there is no penalty for taxpayers who self-correct misreporting. The motivation behind self-correction is not entirely clear. One may argue that self-correction is related to accidental tax evasion. If taxpayers unintentionally overstate the dividend allowance, they may correct their mistake without further obligation. However, one may also argue that self-correction can be used by intentional tax evaders. These evaders overstate the dividend allowance up to the year in which they wish to pay out dividends. In the year of dividend payout, they comply with the rules, since there is no fine as long as the error does not lead to a reduction in income taxes in the year of misreporting.

[Insert Figure 4 about here]

6.2 Time until detection of overstated dividend allowance

Finally, we are interested in the factors that affect the dynamics of self-correction (taxpayer detects the mistake in calculating the dividend allowance) versus external correction (the tax authority corrects the dividend allowance). We examine the risk, or hazard, of being detected due either to self-correction or to external detection. As these two outcomes are mutually exclusive, i.e., competing events, we use a competing risks proportional hazards model with time-varying covariates

(Fine and Gray, 1999). We specify the model as:

$$\lambda(t) = \lambda(0)exp(\theta\mathbf{\Pi}_{j,t} + \nu\mathbf{\Theta}_{i,t}) \tag{6}$$

where we use the time until self-correction and the time until external correction as dependent variables and competing events. The advantage of a hazard model is that it informs us about the dynamics of detecting tax evasion. As independent variables, we include the firm-level controls ($\mathbf{\Pi}_{j,t}$) and individual-level controls ($\mathbf{\Pi}_{j,t}$) from above. We run the competing risks model for all individuals considered *at risk*. That is, we restrict the sample to owners who overstate the dividend allowance in at least one sample year; only these individuals can be detected. This restriction creates a sample-selection bias that we need to correct. To account for selection, we first run a one-to-one matching procedure based on equation (3). We then use the predicted probability scores from this probit regression as weights in the competing risks proportional hazards model (second stage, equation (6)) to control for sample selection in our main model. Our statistical inference in the competing risks hazards model is based on heteroskedasticity-robust standard errors clustered at the individual level.

Table 8 presents regression results for the duration model from equation (6). We present results for the time to self-correction in Panel A. We find that the likelihood that a taxpayer corrects the overstated dividend allowance on his own decreases with number of owners. Put differently, the time until the overstated dividend allowance is self-corrected decreases as the number of owners increases. We find a similar effect for least profitable and most profitable firms, as indicated by the negative coefficient of the squared term of return on equity. That is, the least profitable and most profitable firms are detected earlier than other firms. The positive coefficient of our firm size variable *ln(Assets)* suggests that owners of larger firms have a higher likelihood of self-correction. From the individual-level variables, we find a negative effect from being married and a positive effect from family size on self-correction. Overall, the results in Panel A of Table 8 suggest that self-correction is not well explained by awareness and incentives. It appears that complexity increases the time until self-correction.

[Insert Table 8 about here]

Panel B of Table 8 presents results for time until external detection. Again, only a few variables are significant. For example, if the CHC is a tax sheltering firm, the likelihood of detection is higher and the tax authority detects the mistake earlier. Further, being married and living in a smaller town (*Rural*) is associated with earlier external detection. In rural areas, the auditor may be more familiar with businesses and their actual ownership structure in smaller municipalities. The positive sign on *Born in Sweden* could also be the result of amended tax returns. If a taxpayers consults the tax authority about his past overstated dividend allowance, the tax authority is required to change the prior year's dividend allowance.

Comparison of the results from Table 5 and Table 8 points toward the difference between the characteristics of individuals who overstate the dividend allowance and the determinants of detection. Not all factors that increase the likelihood of filing erroneous tax returns also decrease time until detection by the tax authority, i.e., external correction. For example, while the number of owners is associated with a higher likelihood of overstating the dividend allowance, it has no effect on time until external correction. In fact, we find that only a few variables are significant in the detection equations. One implication of this finding is that there is a lack of effective "red-flag" mechanisms. Such mechanisms should be based on empirical evidence of the characteristics of individuals evading taxes and on factors that increase the complexity of compliance.

7 Conclusion

Tax authorities in many countries experience budget cuts while simultaneously trying to maintain the quality and efficiency of tax compliance. The challenge is to improve tax revenue collection when resources allocated to tax administration are reduced. Audits are costly and there are continuous efforts to automate controls and audit selection of taxpayers. This paper shows that lack of awareness of the tax code and complexity in compliance can increase tax evasion. We also find evidence for a relation between tax rates and observed tax evasion. The type of tax evasion, which we directly observe and identify in tax returns approved by the Swedish tax administration, is often corrected by the taxpayer. Complexity increases the likelihood of misreporting and decreases the probability of detection. The relatively low detection rate of tax authorities can be explained by slowness in adjusting enforcement and audit strategies following implementation of new tax rules and tax forms.

Our findings have four main implications. First, economic models of tax evasion and avoidance should take into account that tax administration and enforcement strategies can affect the tax evasion decision and the level of tax evasion (Shaw, Slemrod, and Whiting, 2010). Second, when designing tax reforms that change taxpayer incentives, policymakers should also adjust enforcement and audit strategies. Otherwise, a tax reform may have unintended consequences, or the desired effect may not occur at all. This argument not only applies to tax policy but to laws in general. For example, Christensen, Hail, and Leuz (2012) show that the liquidity benefits of adopting international financial reporting standards are limited to those countries that also changed enforcement of accounting standards. Also, the threat of stronger enforcement and higher detection risk can effectively decrease tax evasion (Alm, Jackson, and McKee, 2009; Fellner, Sausgruber, and Traxler, 2013). Third, our results add to the literature on tax enforcement strategies (e.g., Sánchez and Sobel, 1993; Chander and Wilde, 1998; Boadway and Sato, 2009; Shaw, Slemrod, and Whiting, 2010; Bigio and Zilberman, 2011). To implement effective control and compliance strategies, tax authorities should merge information across taxpayers and use automated, computer-based plau-

sibility checks, which are capable of automatically detecting all overstated dividend allowances examined in this study. Fourth, at least some of the observed tax evasion observed in this paper appears to be accidental. Overall, only 40% of taxpayers actually benefit from the observed tax evasion given their current tax status. Complex tax rules and tax forms can trigger unintended tax evasion if mistakes are based on a lack of tax awareness and slowness in adapting to new rules.

The main challenge for tax authorities is to distinguish between accidental tax evaders and those that deliberately evade taxes. Easily understandable and well-designed tax forms provide information to taxpayers and can reduce accidental misreporting. Integrating "easy-to-comply" tax forms into the design of control routines enables more automated auditing by tax administrations. Also, by reducing accidental misreporting, tax authorities can shift scarce auditing resources toward detecting intentional tax evasion. Disentangling empirically unintentional and intentional tax non-compliance is a relevant and challenging avenue for future research, policymakers, and tax authorities. The challenge of non-compliance is not related exclusively to taxes. It is a central issue in other areas, such as social security insurance, environmental standards, trade, and tariff regulations, where intended and accidental non-compliance are likely to be present.

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Figure 1: Excerpt from K10-Form for CHC Owners

This figure shows an excerpt from the K10-form for fiscal year 2006. The excerpt shows calculation of the dividend allowance (*Beräkning av gränsbelopp*) under the simplification rule (*Förenklingsregeln*). The annual dividend allowance under the simplification rule (*Årets gränsbelopp enligt förenklingsregeln*) is defined as 64,950 SEK, times the ratio of the number of own shares (*Antal ägde andelar*) to the number of total shares (*Totala antalet andelar*). Taxpayers fill in the field *410*.

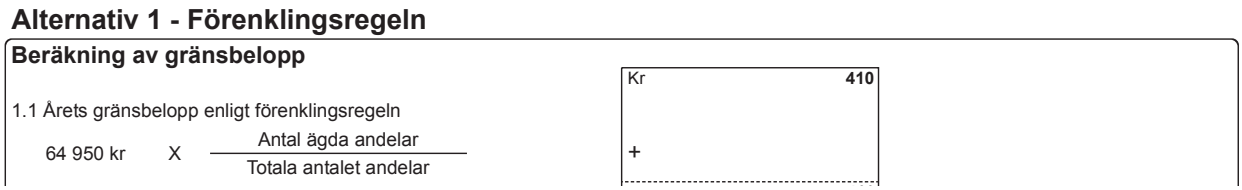

Figure 2: Frequencies of Excess Dividend Allowance Reporting, 2006–2009

This figure plots the frequencies of misreported dividend allowances separately for each of our four sample years. On the horizontal axis, we use the ratio of claimed dividend allowance per firm to the maximum allowance per firm according to the tax law. A value above 1 is regarded as tax evasion by law. On the vertical axis, we use the frequency of cases in each bin.

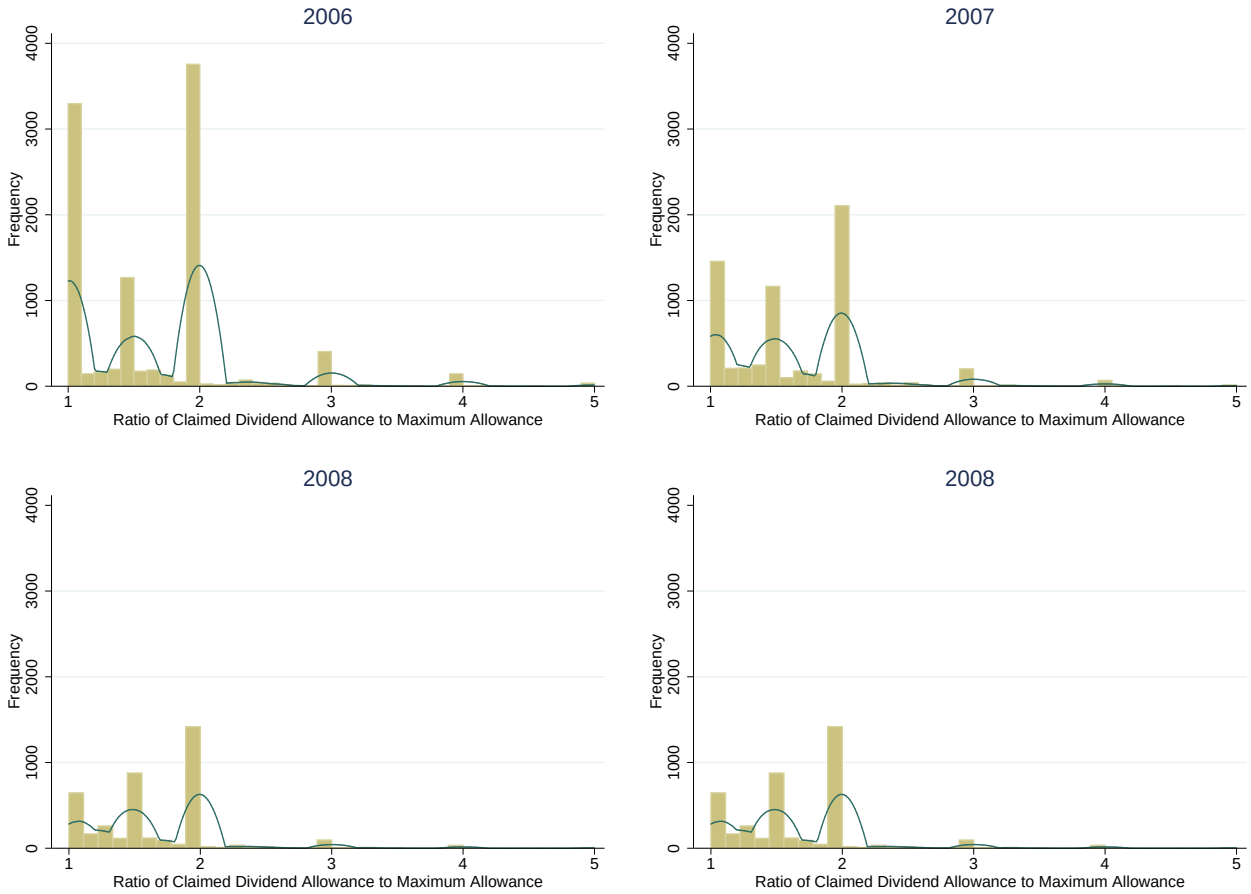

Figure 3: Over-reporting around the Major Kink in the Tax Schedule

This figure shows the percentage of K10 forms with overstated dividend allowances in each bin of SEK 250 around the major kink in the tax rate schedule.

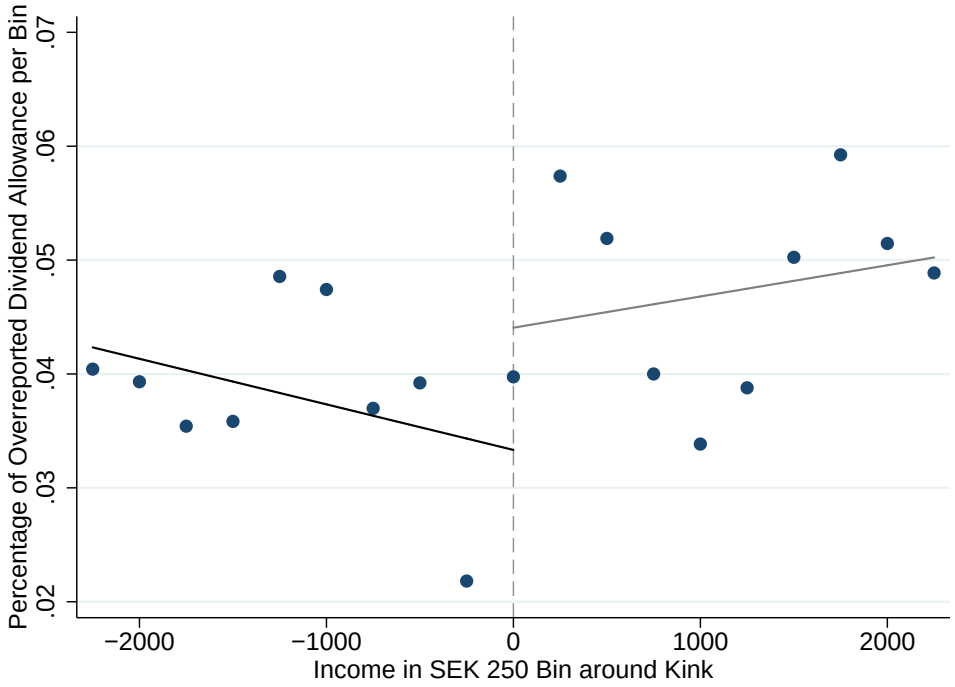

Figure 4: Self-Correction versus External Correction

This figure plots the percentage of overstated dividend allowances in the preceding year (black bar), the percentage of cases detected (gray bar), the fraction of cases detected by the taxpayer (*Self-Correction*), and the percentage of cases detected by the tax authority (*External Correction*). The basis for the calculation for all four statistics is total number K10-forms in a year.

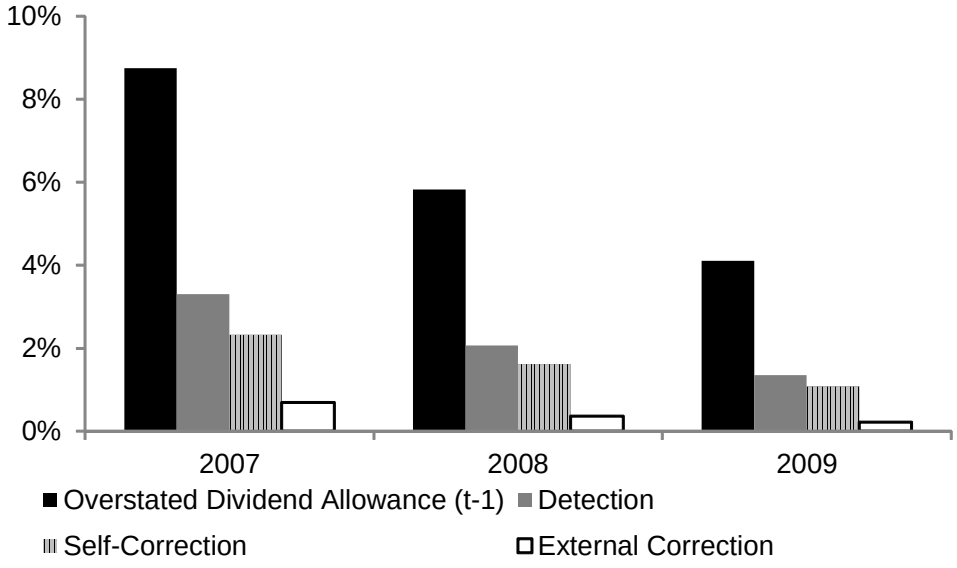

Table 1: Marginal tax rates and thresholds in Sweden, 2006–2009

This table reports marginal tax rates on labor income and dividend income over the sample period. The marginal tax rate on labor income consists of a municipality tax (*Local Tax*, Column 1, averaged over all municipalities), a government-level tax of 20% (*State Tax Level 1*) above the threshold reported in Column (2), and a second level of state tax of 5% above the threshold in Column (3). In Column (4), we present the threshold at which the social security contributions (32.4%) cease to generate benefits. Above the threshold, we treat social security contributions on wage income (remitted at the corporate level) as a tax. The thresholds are reported in Swedish Krona (SEK). In 2006, USD 1 equaled SEK 7.38. The combined marginal tax rate, including social security τ_i contributions is presented in Column (5). We neglect the standard deduction and the earned income tax credit in the calculation. In Columns (6) through (8), we present the corporate tax rate on profits of CHCs (Column 6), dividend taxes at the individual level (Column 7), and combined marginal tax rate on dividends, τ_d, (Column (8)).

	Labor Income					**Dividend Income CHC**		
Year	Local Tax	State Tax Level 1 (20%) above SEK	State Tax Level 2 (5%) above SEK	Social Security Tax Threshold	τ_i	Corp. Tax	Dividend Tax Owner Level	τ_d
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2006	31.60%	317,700	472,300	359,100	31.6%-67.2%	28.00%	20%	42.40%
2007	31.60%	328,600	488,600	403,000	31.6%-67.2%	28.00%	20%	42.40%
2008	31.40%	340,900	507,100	410,000	31.4%-67.1%	28.00%	20%	42.40%
2009	31.50%	380,200	538,800	428,000	31.5%-66.9%	26.30%	20%	41.00%

Table 2: Tax Misreporting in the Dividend Allowance

This table illustrates calculation of the dividend allowance in case of tax misreporting. The example assumes that no dividends are paid out. The maximum available allowance per firm is reported in Column 1. Columns 2 and 5 illustrate the claimed dividend allowance by one active owner holding 50% of shares. In Case 1, such owner claims twice the entitled allowance. In case of no detection, the current claimed allowance increases the total allowance at year-end (Column 4 = Column 3 + 2 and Column 7 = Column 6 + 5). The accumulated allowances in year t in Column 3 and 6 equal the compounded total dividend allowance from the preceding year from Column 4 and 7. Interest rates are 6.54% in 2007, 7.16% in 2008, and 5.89% in 2009.

Year	Maximum Allowance in t	**Case 1: Misreporting of Allowance, Share in CHC = 50%**			**Case 2: Correct Reporting of Allowance, Share in CHC = 50%**		
		Claimed Current Allowance in year t	Accumulated Allowance in year t from last years	Total Allowance at the end of year t	Claimed Current Allowance in year t	Accumulated Allowance in year t from last years	Total Allowance at the end of year t
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
2006	64,950	64,950	0	64,950	32,475	0	32,475
2007	89,000	89,000	69,198	158,198	44,500	34,599	79,099
2008	91,800	91,800	169,525	261,325	45,900	84,762	130,662
2009	120,000	120,000	276,717	396,717	60,000	138,358	198,358

Table 3: Self-Correction versus External correction

This table illustrates self-correction and external correction in mistakes in reporting the dividend allowance. The examples are based on Table 1. The active owner claims the current dividend allowance correctly for the first time in 2008 (values in bold fonts in Columns 2 and 5). In Case 1, a mistake is detected by the taxpayer (self-correction). That is, the excessive and unjustifiable total dividend allowance of preceding years is corrected (value in italics in Column 3). Case 2 illustrates external correction. In this case, the claimed dividend allowance of the preceding year is corrected and in the current year the correct recent dividend allowance is claimed (value in italics in Column 6).

Year	Maximum Allowance in t	**Case 1: Self-Correction of Tax Misreporting**			**Case 2: External Correction of Tax Misreporting**		
		Claimed Current Allowance in year t	Accumulated Allowance in year t from last years	Total Allowance at the end of year t	Claimed Current Allowance in year t	Accumulated Allowance in year t from last years	Total Allowance at the end of year t
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
2006	64,950	64,950	0	64,950	64,950	0	64,950
2007	89,000	89,000	69,198	158,198	89,000	69,198	158,198
2008	91,800	**45,900**	*169,525*	*215,425*	**45,900**	*121,839*	*167,739*
2009	120,000	60,000	228,113	288,113	60,000	177,618	237,618

Table 4: Summary Statistics

This table presents summary statistics for the sample of K10-forms over the period 2006–2009. *Failure* is a dummy variable equal to 1 if the dividend allowance is over-reported. *Self-Correction* (*External correction*) is a dummy equal to 1 if the prior year's failure is corrected and if the excess claimed dividend allowance is not corrected (is corrected as well). Both variables are defined for the 2007–2009 period only. Firm-level controls include eight variables. *Number Owners* is the number of active owners in the firm. *Different Region* is a dummy equal to 1 if the owners of a corporation reside in different counties. *Firm_Age* is the age of the firm in year *t*. *Dividend Payout* is a dummy variable equal to 1 if firm j pays out a dividend in year *t*. *Ln(Assets)* is the natural logarithm of total assets in SEK. *Return on Equity* is the ratio of taxable profit at the CHC level in year t divided by prior-year total book equity. *Financial Assets* is the ratio of financial assets and cash holdings at the CHC level in year t divided by prior-year total assets. *Shifting CHC* is an indicator variable taking the value 1 if the CHC is a holding, shell, or low-turnover corporation designed for tax avoidance (see, Alstadsæter and Jacob, 2013). We include thirteen individual-level control variables. *Number Firms* is the number of firms owned by an individual. *State Tax* is a dummy variable equal to 1 if earned income (labor and business income) in the preceding year exceeds the threshold for the state tax of 20%. *Income Decile* is the decile of the average income distribution of individual i in year *t*. *Age* is taxpayer age in years. *Born in Sweden* is a dummy equal to 1 if the individual was born in Sweden. *Female* is a dummy variable equal to 1 if the taxpayer is female, zero otherwise. *Married* is a dummy variable equal to 1 if the taxpayer is married. *Number Children* is the number of children aged below 19 years. *Tertiary Education* is a dummy variable equal to 1 if the individual holds a tertiary education degree of at least four years of college or university education. *Business Degree* is a dummy variable equal to 1 if the taxpayer holds a tertiary degree in business administration or economics. *Law Degree* (*IT Degree*) is a dummy variable equal to 1 if the individual has studied law (computer sciences). *Rural Area* is an indicator variable equal to 1 if the individual resides in a small village. *City* is an indicator variable equal to 1 if the individual resides in a city with a population of more than 10,000.

	N	Mean	Standard Deviation	10th Percentile	Median	90th Percentile
Panel A: Misreporting Variables						
Failure	574,030	0.049	0.217	0.000	0.000	0.000
Self-Correction	472,628	0.018	0.134	0.000	0.000	0.000
External correction	472,628	0.007	0.081	0.000	0.000	0.000
Panel B: Independent Variables						
Number Owners	574,030	1.902	1.024	1.000	2.000	3.000
Different Region	574,030	0.071	0.256	0.000	0.000	0.000
Firm_Age	574,030	14.870	11.390	3.000	14.000	27.000
Dividend Payout	574,030	0.380	0.486	0.000	0.000	1.000
Ln(Assets)	574,030	14.140	1.353	12.440	14.120	15.860
Return on Equity	574,030	0.068	0.468	-0.354	0.025	0.397
Financial Assets	574,030	0.406	0.356	0.011	0.311	0.985
Shifting CHC	574,030	0.145	0.352	0.000	0.000	1.000
Number Firms	574,030	1.256	0.647	1.000	1.000	2.000
State Tax	574,030	0.447	0.497	0.000	0.000	1.000
Income Decile	574,030	4.973	2.748	1.000	5.000	9.000
Age	574,030	51.640	11.770	36.000	52.000	66.000
Born in Sweden	574,030	0.930	0.256	1.000	1.000	1.000
Female	574,030	0.237	0.425	0.000	0.000	1.000
Married	574,030	0.632	0.482	0.000	1.000	1.000
Number Children	574,030	0.643	0.978	0.000	0.000	2.000
Tertiary Education	574,030	0.195	0.396	0.000	0.000	1.000
Business Degree	574,030	0.162	0.368	0.000	0.000	1.000
Law Degree	574,030	0.017	0.130	0.000	0.000	0.000
IT Degree	574,030	0.011	0.105	0.000	0.000	0.000
Rural Area	574,030	0.172	0.377	0.000	0.000	1.000
City	574,030	0.708	0.455	0.000	1.000	1.000

Table 5: Likelihood of Overstating the Dividend Allowance

This table reports regression results from OLS regressions over the period 2006–2009. The dependent variable is a nominal variable taking the value 1 if the dividend allowance is overstated, 0 otherwise. Independent variables cover all variables from Panel B of Table 4. We report robust standard errors (s.e.) clustered at the individual level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	Firm Level Variables		**Individual Level Variables**		**All Variables**	
	b	s.e.	b	s.e.	b	s.e.
Number Owners	3.594***	0.049			3.868***	0.066
Different Regions	0.432*	0.223			0.728***	0.224
Firm Age	0.021***	0.004			0.010**	0.004
Dividend Payout	-1.345***	0.070			-1.247***	0.072
Ln(Assets)	-0.363***	0.031			-0.360***	0.032
Return on Equity	-0.068	0.106			-0.054	0.106
(Return on Equity)^2	0.175***	0.068			0.163**	0.068
Financial Assets	-1.193***	0.104			-1.005***	0.106
Shifting CHC	-0.622***	0.108			-0.602***	0.111
Number Firms			0.611***	0.095	0.282***	0.080
State Tax			0.571***	0.093	0.599***	0.145
State Tax×Number Owners					-0.432***	0.083
Income Decile 2			-0.146	0.163	-0.157	0.161
Income Decile 3			-0.443***	0.166	-0.431***	0.165
Income Decile 4			-1.005***	0.164	-0.688***	0.164
Income Decile 5			-1.468***	0.169	-0.611***	0.169
Income Decile 6			-1.818***	0.176	-0.570***	0.178
Income Decile 7			-1.809***	0.185	-0.365*	0.189
Income Decile 8			-1.745***	0.193	-0.233	0.198
Income Decile 9			-2.075***	0.202	-0.510**	0.207
Income Decile 10			-2.333***	0.213	-0.560**	0.221
Age			-0.242***	0.026	0.193***	0.027
Age^2			0.002***	0.000	-0.002***	0.000
Born in Sweden			-0.309*	0.160	-0.744***	0.157
Female			1.021***	0.103	-0.125	0.104
Married			0.718***	0.087	0.097	0.086
Number Children			-0.060	0.048	0.061	0.047
Tertiary Education			-1.146***	0.100	-1.200***	0.100
Business Degree			-0.373***	0.107	-0.066	0.105
Law Degree			-1.270***	0.239	0.130	0.229
IT Degree			-0.927***	0.315	-1.002***	0.312
Rural Area			-0.426***	0.164	-0.409**	0.161
City			-0.748***	0.134	-0.612***	0.132
Year 2007	-2.905***	0.094	-3.015***	0.090	-2.905***	0.094
Year 2008	-4.666***	0.098	-4.967***	0.094	-4.673***	0.099
Year 2009	-6.089***	0.097	-6.414***	0.093	-6.088***	0.097
County-FE	Yes		Yes		Yes	
Observations	574,030		574,030		574,030	
R-squared	0.043		0.015		0.044	

Table 6: Tax Incentives, Tax Awareness, and Overstating Dividend Allowances: Local Linear Regressions

This table presents local linear regression results around the major kink in the marginal tax rate. We use the dummy variable *Failure* as the dependent variable. The range is defined in SEK around the first state tax threshold. Individuals above this threshold are subject to the 20% state tax. We present coefficient estimates for a dummy equal to 1 if the individual was above this threshold. We use a range of SEK 1,000 (Columns 1 and 2) and SEK 500 (Columns 3 and 4) around the state tax threshold. We present results without controls (Columns 1 and 3). Columns 2 and 4 present coefficient estimates for crossing the state tax threshold with control variables. Independent variables cover all variables from Panel B of Table 4. Standard errors (shown in parentheses) allow for heteroskedasticity and are clustered at the individual level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	SEK 1,000 around Threshold		**SEK 500 around Threshold**	
	(1)	(2)	(3)	(4)
State Tax	1.839***	1.438**	1.993***	1.582**
	(0.622)	(0.607)	(0.707)	(0.671)
Controls	No	Yes	No	Yes
Year-FE	No	Yes	No	Yes
County-FE	No	Yes	No	Yes
Observations	3,619	3,619	2,405	2,405

Table 7: Tax Incentives, Complexity, and Overstating Dividend Allowances

This table presents local linear regression results around the major kink in the marginal tax rate. We use the dummy variable *Failure* as the dependent variable. The range is defined in SEK around the first state tax threshold. Individuals above this threshold are subject to the 20% state tax. We present coefficient estimates for a dummy equal to 1 if the individual was above this threshold. We use a range of SEK 1,000 (Columns 1 to 3) and SEK 500 (Columns 4 to 6) around the state tax threshold. We present results without controls in Panel A. Panel B presents coefficient estimates for crossing the state tax threshold with control variables. Independent variables cover all variables from Panel B of Table 4. In Column (1) and (3), we restrict the sample to CHCs with two active owners. Columns (2) and (4) use CHCs with more than two active owners. Standard errors (shown in parentheses) allow for heteroskedasticity. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Local Linear Regression without Controls

	SEK 1,000 around Threshold		**SEK 500 around Threshold**	
	2 Owners	>2 Owners	2 Owners	>2 Owners
	(1)	(2)	(3)	(4)
State Tax	3.490**	3.471	4.576***	2.778
	(1.427)	(2.627)	(1.686)	(3.454)
Controls	No	No	No	No
Observations	1,192	529	766	300

Panel B: Local Linear Regression With Controls

State Tax	2.762**	3.425	3.760**	3.047
	(1.393)	(2.522)	(1.650)	(3.420)
Controls	Yes	Yes	Yes	Yes
Observations	1,192	529	766	300

Table 8: Determinants of Self-Correction and External Correction

This table reports regression results from competing risks model over the period 2007-2009. The dependent variable is *time-to-self-correction* (Panel A), and *time-to-external-correction* (Panel B). In Panel A, the competing event is external correction. In Panel B, we use self-correction as the competing event. Independent variables cover all variables from Panel B of Table 4. Standard errors (s.e.) allow for heteroskedasticity and are clustered at the individual level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. The sample consists of 59,775 observations.

	Panel A: Self-Correction			**Panel B: External Correction**		
	Coefficient	s.e.	Hazard Ratio	Coefficient	s.e.	Hazard Ratio
Number Owners	-0.046***	0.006	0.955***	-0.003	0.011	0.997
Different Regions	0.006	0.012	1.006	-0.012	0.023	0.988
Firm Age	0.000	0.000	1.000	-0.006***	0.001	0.994***
Dividend Payout	-0.012	0.009	0.988	-0.005	0.017	0.995
Ln(Assets)	0.006**	0.003	1.006**	0.001	0.006	1.001
Return on Equity	0.054***	0.014	1.055***	0.166***	0.029	1.181***
(Return on Equity)2	-0.024**	0.012	0.976**	-0.111***	0.025	0.895***
Financial Assets	-0.021*	0.013	0.979*	-0.009	0.024	0.991
Shifting CHC	-0.006	0.013	0.994	0.068***	0.023	1.071***
Number Firms	0.009	0.007	1.009	-0.044***	0.015	0.957***
State Tax	0.013	0.024	1.013	0.012	0.045	1.012
State Tax×Owners	-0.002	0.009	0.998	-0.007	0.016	0.993
Income Decile 2	0.011	0.014	1.011	0.021	0.027	1.022
Income Decile 3	0.009	0.014	1.009	0.065**	0.027	1.068**
Income Decile 4	0.015	0.015	1.015	0.058**	0.029	1.059**
Income Decile 5	0.021	0.018	1.022	0.023	0.034	1.023
Income Decile 6	0.005	0.020	1.005	0.026	0.037	1.027
Income Decile 7	0.017	0.021	1.017	0.003	0.042	1.003
Income Decile 8	0.036	0.023	1.037	-0.017	0.044	0.983
Income Decile 9	0.032	0.023	1.033	0.013	0.046	1.013
Income Decile 10	-0.007	0.027	0.993	0.097**	0.048	1.102**
Born in Sweden	0.000	0.036	1.000	0.144**	0.073	1.155**
Female	0.010	0.023	1.010	0.071*	0.042	1.074*
Married	-0.016**	0.008	0.984**	0.041***	0.016	1.041***
Number Children	0.010***	0.004	1.010***	0.006	0.007	1.006
Tertiary Education	0.005	0.011	1.005	0.033	0.021	1.034
Business Degree	0.001	0.010	1.001	-0.027	0.020	0.973
Law Degree	-0.051	0.047	0.950	0.011	0.073	1.012
IT Degree	0.005	0.035	1.005	-0.057	0.073	0.945
Rural Area	-0.042***	0.013	0.958***	0.060**	0.027	1.062**
City	-0.022**	0.011	0.978**	0.037	0.023	1.038

Appendix—Not for publication

Table A.1: Overstating the Dividend Allowance—Alternative Dependent Variable

This table replicates Table 5 but uses the dummy variable *Failure* as the dependent variable, where we set *Failure* to 1 only if the individual reports 100% of the maximum dividend allowance. We report robust standard errors (s.e.) clustered at the individual level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	b	s.e.	b	s.e.	b	s.e.
Number Owners	1.632***	0.035			1.768***	0.047
Different Regions	-0.494***	0.165			-0.205	0.166
Firm Age	0.022***	0.003			0.013***	0.003
Dividend Payout	-1.066***	0.057			-0.984***	0.059
Ln(Assets)	-0.194***	0.025			-0.144***	0.027
Return on Equity	0.150*	0.086			0.144*	0.086
(Return on Equity)^2	-0.049	0.056			-0.042	0.056
Financial Assets	-0.837***	0.085			-0.682***	0.086
Shifting CHC	-0.313***	0.089			-0.165*	0.092
Number Firms			0.090	0.060	-0.082	0.058
State Tax			0.221***	0.075	0.328***	0.105
State Tax×Number Owners					-0.263***	0.057
Income Decile 2			-0.059	0.137	-0.052	0.137
Income Decile 3			-0.415***	0.139	-0.370***	0.139
Income Decile 4			-0.818***	0.138	-0.589***	0.139
Income Decile 5			-1.112***	0.140	-0.580***	0.142
Income Decile 6			-1.329***	0.147	-0.589***	0.150
Income Decile 7			-1.339***	0.153	-0.498***	0.157
Income Decile 8			-1.267***	0.159	-0.386**	0.165
Income Decile 9			-1.465***	0.166	-0.559***	0.173
Income Decile 10			-1.660***	0.172	-0.690***	0.181
Age			-0.034*	0.020	0.154***	0.021
Age^2			0.000**	0.000	-0.001***	0.000
Born in Sweden			-0.306**	0.133	-0.509***	0.132
Female			0.756***	0.086	0.270***	0.087
Married			0.558***	0.071	0.286***	0.071
Number Children			-0.034	0.039	0.012	0.039
Tertiary Education			-0.811***	0.080	-0.775***	0.081
Business Degree			-0.343***	0.086	-0.206**	0.086
Law Degree			-0.925***	0.176	-0.289*	0.175
IT Degree			-0.700***	0.242	-0.671***	0.242
Rural Area			-0.275**	0.137	-0.261*	0.136
City			-0.608***	0.111	-0.526***	0.110
Year 2007	-2.893***	0.094	-2.962***	0.075	-2.948***	0.080
Year 2008	-4.663***	0.098	-4.364***	0.079	-4.238***	0.084
Year 2009	-6.083***	0.097	-5.229***	0.080	-5.100***	0.084
County-FE	Yes		Yes		Yes	
Observations	574,030		574,030		574,030	
R-squared	0.022		0.014		0.024	

Table A.2: Tax Incentives, Tax Awareness, and Overstating Dividend Allowances: Local Linear Regressions—Alternative Dependent Variable

This table replicates Table 6 but uses the dummy variable *Failure* as the dependent variable, where we set *Failure* to 1 only if the individual reports 100% of the maximum dividend allowance. The range is defined in SEK around the first state tax threshold. Individuals above this threshold are subject to the 20% state tax. We present coefficient estimates for a dummy equal to 1 if the individual was above this threshold. We use a range of SEK 1,000 (Columns 1 and 2) and SEK 500 (Columns 3 and 4) around the state tax threshold. We present results without controls (Columns 1 and 3). Columns 2 and 4 present coefficient estimates for crossing the state tax threshold with control variables. Independent variables cover all variables from Panel B of Table 4. Standard errors (shown in parentheses) allow for heteroskedasticity and are clustered at the individual level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	SEK 1,000 around Threshold		**SEK 500 around Threshold**	
	(1)	(2)	(3)	(4)
State Tax	1.702***	1.370***	1.550***	1.211**
	(0.510)	(0.495)	(0.564)	(0.531)
Controls	No	Yes	No	Yes
Year-FE	No	Yes	No	Yes
County-FE	No	Yes	No	Yes
Observations	3,619	3,619	2,405	2,405

Table A.3: Tax Incentives, Complexity, and Overstating Dividend Allowances—Alternative Dependent Variable

This table replicates Table 7 but uses the dummy variable *Failure* as the dependent variable, where we set *Failure* to 1 only if the individual reports 100% of the maximum dividend allowance. The range is defined in SEK around the first state tax threshold. Individuals above this threshold are subject to the 20% state tax. We present coefficient estimates for a dummy equal to 1 if the individual was above this threshold. We use a range of SEK 1,000 (Columns 1 to 3) and SEK 500 (Columns 4 to 6) around the state tax threshold. We present results without controls in Panel A. Panel B presents coefficient estimates for crossing the state tax threshold with control variables. Independent variables cover all variables from Panel B of Table 4. In Columns (1) and (3), we restrict the sample to CHCs with two active owners. Columns (2) and (4) use CHCs with more than two active owners. Standard errors (shown in parentheses) allow for heteroskedasticity. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Local Linear Regression without Controls

	SEK 1,000 around Threshold		**SEK 500 around Threshold**	
	2 Owners	>2 Owners	2 Owners	>2 Owners
	(1)	(2)	(3)	(4)
State Tax	3.701***	2.495	4.387***	0.000
	(1.314)	(1.730)	(1.535)	(2.122)
Controls	No	No	No	No
Observations	1,192	529	766	300

Panel B: Local Linear Regression With Controls

State Tax	3.288**	2.343	4.375***	0.349
	(1.290)	(1.715)	(1.482)	(2.442)
Controls	Yes	Yes	Yes	Yes
Observations	1,192	529	766	300

Table A.4: Determinants of Self-Correction and External Correction

This table replicates Table 8 but uses the dummy variable *Failure* as the dependent variable, where we set *Failure* to 1 only if the individual reports 100% of the maximum dividend allowance. The dependent variable is time-to-self-correction (Panel A), and time-to-external-correction (Panel B). In Panel A, the competing event is external correction. In Panel B, we use self-correction as the competing event. Independent variables cover all variables from Panel B of Table 4. Standard errors (s.e.) allow for heteroskedasticity. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. The sample consists of 39,092 observations.

	Panel A: Self-Correction			**Panel B: External Correction**		
	Coefficient	s.e.	Hazard Ratio	Coefficient	s.e.	Hazard Ratio
Number Owners	-0.077***	0.009	0.926***	0.056***	0.010	1.057***
Different Regions	-0.003	0.020	0.997	-0.014	0.025	0.986
Firm Age	0.000	0.000	1.000	-0.007***	0.001	0.993***
Dividend Payout	-0.007	0.012	0.993	-0.011	0.017	0.990
Ln(Assets)	0.011***	0.004	1.011***	-0.011*	0.006	0.989*
Return on Equity	0.043**	0.018	1.044**	0.173***	0.030	1.189***
(Return on Equity)^2	0.019	0.015	1.019	-0.082***	0.028	0.921***
Financial Assets	-0.049***	0.017	0.952***	0.007	0.024	1.007
Shifting CHC	-0.013	0.017	0.987	0.054**	0.024	1.055**
Number Firms	-0.023**	0.011	0.978**	-0.006	0.016	0.994
State Tax	-0.005	0.035	0.995	0.031	0.045	1.032
State Tax×Owners	0.007	0.014	1.008	-0.020	0.016	0.981
Income Decile 2	0.019	0.018	1.019	0.003	0.027	1.003
Income Decile 3	0.015	0.018	1.015	0.045*	0.027	1.046*
Income Decile 4	0.016	0.020	1.016	0.025	0.029	1.025
Income Decile 5	0.018	0.023	1.018	0.029	0.035	1.030
Income Decile 6	0.011	0.025	1.011	-0.011	0.037	0.989
Income Decile 7	0.051*	0.027	1.052*	-0.051	0.044	0.951
Income Decile 8	0.014	0.031	1.014	-0.017	0.046	0.983
Income Decile 9	0.031	0.031	1.032	0.051	0.046	1.052
Income Decile 10	0.020	0.035	1.020	0.056	0.051	1.057
Born in Sweden	-0.035	0.043	0.965	0.134*	0.073	1.144*
Female	-0.008	0.029	0.992	0.062	0.042	1.063
Married	-0.015	0.010	0.985	0.035**	0.016	1.036**
Number Children	0.011**	0.005	1.011**	0.014*	0.007	1.014*
Tertiary Education	-0.014	0.015	0.986	0.033	0.021	1.033
Business Degree	-0.007	0.013	0.993	0.008	0.020	1.008
Law Degree	0.027	0.054	1.027	-0.026	0.072	0.975
IT Degree	0.024	0.045	1.024	-0.020	0.081	0.981
Rural Area	-0.057***	0.017	0.945***	0.023	0.027	1.023
City	-0.030**	0.014	0.971**	0.024	0.023	1.024

Table A.5: Determinants of Self-Correction and External Correction—Restricting the Sample to Firms with Multiple Owners

This table replicates Table 5 but restricts the sample to firms with at least two active owners. The dependent variable is a nominal variable taking the value 1 if the dividend allowance is overstated, zero otherwise. Independent variables cover all variables from Panel B of Table 4. We report robust standard errors (s.e.) clustered at the individual level. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	Firm Level Variables		**Individual Level Variables**		**All Variables**	
	b	s.e.	b	s.e.	b	s.e.
Number Owners	1.072***	0.083			1.220***	0.111
Different Regions	0.996***	0.222			1.249***	0.225
Firm Age	0.043***	0.006			0.032***	0.006
Dividend Payout	-2.382***	0.120			-2.186***	0.122
Ln(Assets)	-0.619***	0.052			-0.642***	0.055
Return on Equity	-0.451**	0.192			-0.440**	0.191
(Return on Equity)^2	0.301**	0.118			0.267**	0.118
Financial Assets	-1.847***	0.186			-1.507***	0.188
Shifting CHC	-0.866***	0.199			-0.883***	0.202
Number Firms			0.509***	0.149	0.382***	0.138
State Tax			0.275	0.169	-0.181	0.401
State Tax×Number Owners					-0.018	0.146
Income Decile 2			-0.888***	0.262	-0.570**	0.262
Income Decile 3			-1.609***	0.268	-0.999***	0.269
Income Decile 4			-2.387***	0.271	-1.375***	0.273
Income Decile 5			-2.765***	0.289	-1.289***	0.294
Income Decile 6			-2.956***	0.312	-1.265***	0.319
Income Decile 7			-2.649***	0.332	-0.843**	0.340
Income Decile 8			-2.488***	0.347	-0.593*	0.358
Income Decile 9			-3.117***	0.365	-1.117***	0.375
Income Decile 10			-3.129***	0.397	-1.048**	0.411
Age			0.169***	0.040	0.256***	0.040
Age^2			-0.001***	0.000	-0.002***	0.000
Born in Sweden			-1.327***	0.289	-1.395***	0.289
Female			-1.187***	0.156	-1.052***	0.156
Married			-1.023***	0.165	-0.860***	0.165
Number Children			0.141*	0.080	0.142*	0.080
Tertiary Education			-1.525***	0.174	-1.772***	0.176
Business Degree			-0.018	0.188	-0.054	0.188
Law Degree			0.881	0.690	0.877	0.677
IT Degree			-1.345**	0.539	-1.565***	0.538
Rural Area			-0.620**	0.274	-0.617**	0.273
City			-0.909***	0.223	-0.891***	0.222
Year 2007			-5.116***	0.149	-5.060***	0.161
Year 2008			-8.326***	0.158	-8.116***	0.169
Year 2009			-10.797***	0.156	-10.715***	0.168
County-FE	Yes		Yes		Yes	
Observations	328,991		328,991		328,991	
R-squared	0.025		0.022		0.027	

Table A.6: Differences in Observables around First State Tax Threshold

This table presents differences in the characteristics of individuals above and below the first threshold for the state tax. Variables are as described in Panel B of Table 4. We present differences for different cutoff points. We use Mann-Whitney U-tests to test for significant differences. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	SEK 1,000 around Cutoff			**SEK 500 around Cutoff**		
	Below Cutoff	Above Cutoff	**Difference**	Below Cutoff	Above Cutoff	**Difference**
Number Owners	1.688	1.705	**-0.017**	1.613	1.644	**-0.030**
Different Regions	0.043	0.048	**-0.005**	0.038	0.040	**-0.001**
Firm Age	13.982	13.727	**0.255**	13.360	13.351	**0.009**
Dividend Payout	0.521	0.506	**0.016**	0.555	0.530	**0.025**
Ln(Assets)	14.215	14.277	**-0.062**	14.289	14.312	**-0.023**
Return on Equity	0.145	0.540	**-0.009**	0.145	0.163	**-0.177**
Financial Assets	0.508	0.497	**0.111**	0.540	0.515	**0.254**
Shifting CHC	0.132	0.126	**0.006**	0.132	0.131	**0.001**
Number Firms	1.265	1.314	**-0.049**	1.274	1.333	**-0.058**
Age	51.436	51.028	**0.408**	51.136	50.432	**0.703**
Born in Sweden	0.944	0.930	**0.014***	0.938	0.930	**0.008**
Female	0.195	0.188	**0.008**	0.170	0.182	**-0.012**
Married	0.631	0.630	**0.001**	0.631	0.619	**0.012**
Number Children	0.576	0.615	**-0.039**	0.553	0.607	**-0.053**
Tertiary Education	0.237	0.246	**-0.008**	0.250	0.256	**-0.006**
Business Degree	0.184	0.204	**-0.020**	0.189	0.212	**-0.023**
Law Degree	0.011	0.017	**-0.006**	0.010	0.021	**-0.011**
IT Degree	0.018	0.013	**0.005**	0.022	0.016	**0.006****
Rural Area	0.141	0.159	**-0.018**	0.126	0.149	**-0.023***
City	0.739	0.738	**0.001**	0.746	0.745	**0.000**

Table A.7: Tax Incentives, Complexity, and Overstating Dividend Allowances—Number of Firms as Alternative Sample Split Variable

This table replicates Table 7 but uses *Number Firms* as a proxy for complexity. In Columns (1) and (3), we restrict the sample to owners with one firm. Columns (2) and (4) use owners with more than one firm. Standard errors (shown in parentheses) allow for heteroskedasticity. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Local Linear Regression without Controls				
	SEK 1,000 around Threshold		**SEK 500 around Threshold**	
	1 Firm	>1 Firm	1 Firm	>1 Firm
State Tax	1.963***	1.293	2.474***	0.484
	(0.689)	(1.450)	(0.791)	(1.526)
Controls	No	No	No	No
Observations	2,950	669	1,939	466
Panel B: Local Linear Regression with Controls				
State Tax	1.455**	0.959	1.799**	0.927
	(0.678)	(1.485)	(0.756)	(1.377)
Controls	Yes	Yes	Yes	Yes
Observations	2,950	669	1,939	466

Table A.8: Tax Incentives, Complexity, and Overstating Dividend Allowances—Different Region as Alternative Sample Split Variable

This table replicates Table 7 but uses *Different Region* as a proxy for complexity. In Columns (1) and (3), we restrict the sample to CHCs with owners in the same region. Columns (2) and (4) use CHCs with owners in different regions. Standard errors (shown in parentheses) allow for heteroskedasticity. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Local Linear Regression without Controls				
	SEK 1,000 around Threshold		**SEK 500 around Threshold**	
	Same Region	Different Region	Same Region	Different Region
State Tax	1.745***	2.766	2.098***	1.196
	(0.605)	(5.001)	(0.691)	(5.909)
Controls	No	No	No	No
Observations	3,455	164	2,312	93
Panel B: Local Linear Regression With Controls				
State Tax	1.372**	-0.271	1.636**	6.450
	(0.595)	(5.564)	(0.667)	(7.473)
Controls	Yes	Yes	Yes	Yes
Observations	3,455	164	2,312	93