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# Who Participates in Tax Avoidance?\*

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## Abstract

This paper empirically examines why tax avoidance differs across individuals. We use rich Swedish administrative panel data on all taxpayers, with a link between corporate and individual tax returns. Surprisingly, few individuals utilize legal and observable tax avoidance opportunities. Our results show that there are several frictions in tax avoidance participation. In addition to monetary benefits from tax avoidance (*incentives*), the opportunity to participate in tax avoidance (*access*), as well as information and knowledge about these opportunities (*awareness*), are important factors for the individual's tax avoidance decision. We further show that information about tax avoidance opportunities spreads within informal networks.

**Keywords:** Tax avoidance, Network effects, Individual taxation

**JEL Classification:** H20, H24, D14

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# 1 Introduction

Recent empirical studies suggest that there is substantial heterogeneity in how individuals respond to incentives and policy changes. For example, not all eligible individuals claim welfare benefits (Chetty, Friedman, and Saez, 2013), fully optimize the timing of capital gains realization (Ivković, Poterba, and Weisbenner, 2005), or exploit tax saving possibilities (Stephens and Ward-Batts, 2004). We document that only 0.6% of the Swedish population exploits a legal tax avoidance opportunity. These are puzzling results, as we would expect all individuals to exploit all available legal means to maximize net income. We explain and empirically document why the extent of tax avoidance activities differs across individuals.

We categorize potential explanations for the observed heterogeneity across individuals in take-up of incentives or benefits into three conditions that must be satisfied for an individual to participate in legal tax avoidance, namely, *incentive*, *access*, and *awareness*. First, the taxpayer must have a monetary incentive to participate in tax avoidance. That is, the tax benefit from the tax planning activity must outweigh one-time and recurring costs. Second, the taxpayer needs access to tax-avoidance strategies. For example, employees generally have less opportunity to shift income across tax bases than owner-managers of closely held corporations (CHCs). Finally, the taxpayer must have awareness of the tax code, of the incentive to minimize taxes, and of the opportunities available to do so.<sup>1</sup>

The main challenge for empirical studies on participation in tax avoidance is the lack of convincing individual income tax data that allows both control of demographic characteristics and observation of legal tax avoidance behavior. We employ a rich administrative panel data set from Sweden to analyze sources of heterogeneity in participation in observable tax avoidance in the form of income shifting. Income shifting is the (legal) process of relabeling existing income or assets to reduce total tax payments.<sup>2</sup> We observe three types of tax avoidance companies: holding companies, low-turnover companies, and shell companies. A holding company enables individuals to shift income within the capital income tax base,

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<sup>1</sup> We have encountered first-hand, anecdotal evidence on the importance of awareness. Several Swedish seminar participants told us after having listened to our presentation, i.e., after becoming aware, that they will follow the tax avoidance strategies outlined in this paper.

<sup>2</sup> The main types of income shifting are across time, across tax bases, and across taxpayers (Stiglitz, 1985).

that is, to re-label dividends from a widely held corporation (WHC) as lower-taxed dividends from a CHC. A low-turnover company can be established to re-label labor income as lower-taxed dividend income. A shell company serves as an option for future tax savings. Our panel data set for 2000–2009 derives from the tax returns of all corporations in Sweden as well as all individual income tax returns with individual demographic information for the entire Swedish population, comprising about 60 million observations. We identify owners of corporations and link information across data sets to obtain detailed individual socioeconomic characteristics on these owners. Surprisingly, only a very small part of the Swedish population employ these tax avoidance strategies.

Our empirical strategy of examining the reasons for this low percentage is threefold. First, we analyze the cross-sectional correlates of tax avoidance participation using the entire sample, to determine what characterizes tax avoiders. We find a positive association between various proxies for having an incentive to participate in income shifting, such as being subject to a high marginal tax, and the probability of owning a tax sheltering firm. Individuals with easier access to income shifting, for example, accountants and consultants, are more likely to own a tax shelter. In contrast, public employees are less likely to own a tax shelter. Awareness appears to be important in explaining heterogeneity in participation in income shifting. We find a positive association between various awareness related proxies, for example, having higher education in business-related subjects or having a parent that is a business owner, and ownership of a tax avoidance firm.

Second, we exploit a 2006 tax reform that reduced the dividend tax rate for CHCs by 10 percentage points. Using a difference-in-difference (DD) framework, we find evidence on the impact of incentives, access, and awareness on tax avoidance participation. We show empirically that individuals with an incentive to shift income have a higher likelihood to own and to establish tax-shelter companies than individuals without a tax incentive. The economic effects are substantial. For example, the likelihood of establishing a low-turnover firm (shell-corporation) increases by 204% (140%) around the tax reform if an individual is subject to high income taxation. Also, individuals with access to income shifting have a higher likelihood of owning and establishing tax-shelter companies than individuals without easy access. Again, the economic effects are large. For example, the likelihood of establishing

a low-turnover firm (shell-corporation) increases by 129% (287%) around the tax reform if the individual is an accountant or consultant, and thus has easier access to income shifting through a low-turnover corporation.

Finally, we exploit differences across geographic areas in the density of tax avoidance activities to identify the effect on participation in tax avoidance of awareness and flow of information in informal networks. This identification strategy is similar to Chetty, Friedman, and Saez (2013). If more individuals in a municipality own a tax-shelter firm, information on tax incentives, tax rules, and on how to establish tax-shelter firms is more easily available and flows through informal channels within a geographic area. Using a DD approach, we show that there is a strong and positive effect of information within a network on an individual's likelihood of establishing a tax-shelter company. For example, the likelihood of establishing a low-turnover firm (shell-corporation) increases by 16% (55%) around the tax reform if the individual resides in a municipality with a high density of tax avoiders.

To validate our proxy of awareness, we exploit information on municipality of residence and of the employer. The network effect, proxied by the density of income-shifting firms in the municipality of residence, is positive and significant for all three measures of tax avoidance. Since this density can be correlated with other unobservable municipality characteristics, we also exploit differences in exposure to informal information across commuters and non-commuters. We predict and show empirically that individuals who live and work in the same region are more responsive to information at the residing municipality level than commuters. We further find that commuters are additionally affected by tax avoidance density in the municipality of the employer. That is, the likelihood of owning a tax shelter increases if the individual works in a region with a higher density of tax avoidance firms. These results indicate that information about tax avoidance opportunities spreads within informal networks at the private level and at the work level, and it has an economically significant effect on the individual's likelihood of avoiding taxes.

To our knowledge, this is the first paper to give a comprehensive overview of reasons why not every individual fully exploits tax avoidance opportunities. Our results demonstrate that there are several frictions in the tax avoidance decision. Apart from the monetary benefits from tax avoidance (*incentive*), the opportunity to participate in tax avoidance is

an important factor (*access*). In addition, information and knowledge about tax avoidance opportunities is critical for the take-up of tax avoidance incentives (*awareness*). Even though we focus on three particular Swedish tax avoidance strategies, our results have external validity and can provide a qualitative framework for analyzing heterogeneity in tax avoidance participation in other settings. For instance, our framework can partly explain the low share of observed income shifters in the sample of Stephens and Ward-Batts (2004): Even among those households who have incentives to shift assets across spouses, both access to and/or awareness of tax avoidance mechanisms may be limited. Similarly, lack of awareness may explain why not all individual investors fully optimize the timing of capital gains and loss realizations (Ivković, Poterba, and Weisbenner, 2005) Our results also have policy implications. Differences in access and awareness can explain heterogeneity in the uptake of various incentives and policy interventions. This heterogeneity can then affect horizontal as well as vertical equity.

The remainder of this paper proceeds as follows. In Section 2, we describe the Swedish tax system and incentives for establishing tax sheltering firms. Section 3 describes the data and variables. In Section 4, we present our empirical results, and Section 5 sets forth our conclusions.

## 2 Tax rules and tax planning incentives

Sweden has a dual income tax, with progressive taxes on labor income and a proportional tax on capital income. The progressivity of the tax on labor income results from a basic flat municipality tax and two additional state-level taxes that apply at different thresholds. Including employee-level social security contributions on wage payments, the total top marginal tax rate on wage income amounts to 67% for the year 2006.<sup>3</sup> Table 1 gives an overview of developments in marginal tax rates and thresholds for the period 2000–2009.

[Insert Table 1 about here]

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<sup>3</sup> The combined top marginal tax rate on wages is calculated as  $(\text{Wage tax} + \text{Social security tax}) / (1 + \text{Social security tax}) = ((0.315 + 0.20 + 0.05) + 0.314) / (1 + 0.314) = 0.66895$ .

Table 1 also summarizes tax rates on capital income. Profits of CHCs are taxed at the corporate level at a rate of 28%, and at the individual level at a rate of 20% (2006 values). This results in a combined top marginal tax rate on dividends of 42.4%.<sup>4</sup> The difference between the top marginal tax rates on labor and capital income amounts to 24.6 percentage points and creates strong incentives to reclassify wage income as dividend income for individuals with high wage income. Importantly, as soon as an individual is in the second tax bracket for wage income (about 51%), the combined tax rate on dividends is below the tax rate on wage income, and the individual has a tax incentive to declare wage income as dividend income. In other words, if an individual is subject to a tax rate on wages of 51% or higher, individuals would benefit from shifting wage income to dividend income.

However, ordinary wage earners have little access to this type of income shifting. In contrast, active owners of smaller firms can decide what to pay themselves in wages and how much to distribute as dividends. Sweden's so-called 3:12 rules are designed to prevent such income shifting by firm owners. According to these rules, dividends to active owners of CHCs are taxed as dividends only up to a particular limit—the imputed dividend allowance.<sup>5</sup> The dividend allowance is a function of the equity and wage costs of the corporation. Importantly, any unused dividend allowances are carried forward with interest. Dividends in excess of the dividend allowance are taxed as labor income. The 2006 reform of the 3:12 rules increased the imputed dividend allowance for most active owners and cut the tax rate on dividends within the dividend allowance by 10 percentage points.<sup>6</sup> Also, an optional new method for

<sup>4</sup> The total top marginal tax rate on dividends is calculated as dividend tax + corporate income tax - (Dividend tax × corporate income tax) = 0.20 + 0.28 - (0.20 × 0.28) = 0.424.

<sup>5</sup> 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. At least one shareholder needs to be active. A shareholder is active if he contributes to profit generation in the firm to a considerable extent. If these criteria are not met, the corporation is considered a WHC. There are no differences in taxation at the corporate level between WHCs and CHCs. Differences in tax treatment occur at the shareholder level. For a detailed overview on the 3:12 rules and the definition of the dividend allowance, see Alstadsæter and Jacob (2012), Chapter 3 and Appendix I.

<sup>6</sup> Before the reform, owners of CHCs were entitled to a small tax-exempt dividend (*Lättnadsregeln*). This tax-exempt dividend was limited to 70% of the interest rate on government bonds, which varied between 4% and 5% over the 2001–2005 period. The dividend allowance for taxable dividends amounted to the interest rate on government bonds plus seven percentage points and a wage base allowance. In total, the dividend allowance for taxable dividends was well above the allowance for tax-exempt dividends. Thus, it is reasonable to assume that the tax reform indeed led to a tax decrease, even in the average tax rate.

imputing the dividend allowance was introduced, under which the dividend allowance per firm was fixed independent of activity, equity, and employment in the firm.

Every taxpayer has the opportunity to set-up and own a CHC. Individuals are required to have a minimum equity of SEK 100,000 (about USD 13,550 in 2006) during our sample period to establish a CHC. There are some additional one-time costs, such as registration fees, which are estimated to be approximately SEK 10,000. Since all corporations are additionally required to file balance sheets and income statements, there are expected to be recurring annual costs for accounting services of approximately SEK 10,000. Given these one-time and recurring costs, an individual benefits from owning a tax-shelter firm only if the tax savings outweigh these costs.

We next present the three specific legal tax avoidance strategies that we analyze in this paper.<sup>7</sup> The main idea behind establishing a CHC is to facilitate shifting income from (highly taxed) labor to (lower-taxed) capital income. Such income shifting has been described as the Achilles heel of dual income tax systems, which are implemented in, for example, Norway, Finland, and Denmark (Sørensen, 1994). The main analysis in Section 4 is illustrated with descriptive statistics showing that each of the strategies indeed appears to facilitate tax planning objectives.

## **2.1 Holding corporations: Income shifting across types of capital income**

A holding corporation is established for the purpose of owning assets and shares in other corporations at the corporate level instead of the individual level. Apart from organizational reasons, there are clear tax incentives that favor operating a holding corporation. As of 2004, dividend income and capital gains from shares are tax-exempt at the corporate level in Sweden.<sup>8</sup> Individuals can thus defer dividend and capital gains taxes until they decide to distribute these funds from the holding company. This is particularly important for

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<sup>7</sup> One possible concern is tax rule uncertainty in Sweden. Individuals may be reluctant to take up these income shifting incentives if the rules change frequently. Swedish tax law, however, has proven to be very stable. The dual income tax was introduced in 1991 and there is no discussion of abandoning the present system. Further, the 3:12 rules may have experienced minor adjustments over time, but a change in incentives with a tax rate cut, as in 2006, was a unique occurrence over the past two decades.

<sup>8</sup> For shares in listed firms, dividends and capital gains are tax-exempt only if the company holds 10% or more of the voting rights or if the shares are held for organizational purposes. Therefore, a holding company does not work as a tax avoidance tool for portfolios of listed stocks.



minority shareholdings in unlisted corporations, where the minority owner has less control over dividend payout policy. As of 2006, holding companies additionally allow individual shareholders to reduce tax rates on dividends from WHCs from 30% (if listed) or 25% (if unlisted) to 20% if capital income is channeled through a closely held holding company. We define a corporation as a *holding company* if at least 80% of the corporation's turnover arises from financial income from affiliated companies (dividends and profit distributions).

To demonstrate the validity of our holding company dummy as a proxy for tax avoidance, we compare the income composition of owners of a holding CHC owning a holding corporation in all sample years to a sample of comparable CHC owners who run a CHC but who never invest in a tax-sheltering company. If owner-managers use their holding companies to shift assets from the individual to the corporate level, we expect that individuals substitute capital income derived outside the CHC with dividends from the CHC, for example, by shifting assets and shares in unlisted WHCs to the holding CHC. Incentives for such income shifting increased after 2006, as discussed above. Relative income changes for different income sources are presented in Table 2.

[Insert Table 2 about here]

In line with our expectations, it appears that holding company owners do not experience higher total before-tax income growth than other CHC owners around 2006 (Column 1 and 2). However, holding firm owners appear to experience a change in the composition of their capital income; they increase dividends from CHCs and reduce dividend income from other sources relative to CHC owners without a tax-shelter firm. This indicates that active owners use holding companies to shift capital income from WHCs to CHCs. In this way, they potentially reduce the tax rate on their dividend income by 10 percentage points. This increases their after-tax income relative to individuals who do not channel their dividend income from WHCs through a holding firm. Most importantly, the descriptive statistics on the relative change in income sources is in line with income shifting across bases and over time. This result indicates that holding companies facilitate income shifting.

## 2.2 Low-turnover corporations: Income shifting from labor income to capital income

High-income wage earners have incentives to channel parts of their wage income through a side business organized as a CHC. By re-classifying wage income in excess of the state tax threshold as dividend income, the combined top marginal tax burden on labor income can be reduced from 67% to the combined marginal tax rate on dividends from a CHC of 42.4%. Anecdotal evidence suggests that high-income individuals, particularly consultants and accountants, establish firms for side business or anticipated future business. We define a corporation as a *low-turnover company* if average turnover is below SEK 200,000 (about USD 27,100), average wages are less than SEK 100,000, and the corporation is not a holding company. However, such low-turnover firms could also be used to generate additional income. Since the marginal tax rate on income earned as dividends can be below the marginal income tax rate on wages, individuals may increase labor supply and generate additional income. Also, negotiating contracts through a CHC can increase the return to labor supply since, for example, compensation per hour increases. It is an empirical question whether our definition of low-turnover firms reflects income shifting or income generation.

Therefore, we wish to validate whether low-turnover companies are indeed used for income shifting activities. We compare the income composition of individuals who establish a low-turnover firm after 2006 (when incentives for such firms increased) to comparable wage earners who do not participate in a CHC or a low-turnover firm in any year. Relative income differences for different income sources are presented in Table 3.

[Insert Table 3 about here]

These descriptive statistics indicate that individuals who establish a low-turnover firm do not generate additional income (columns 1 and 2). However, it appears that owner-managers in low-turnover firms change the composition of their income: They substitute highly taxed labor income with lower-taxed dividend income. This increases total after-tax income while keeping before-tax income constant. This further supports the notion that low-turnover firms are used for tax avoidance purposes.

## 2.3 Shell corporations: Option for income shifting from labor income to capital income

The third tax avoidance tool is the shell corporation. The purpose of the shell corporation is to accumulate unused dividend allowances and to forward these with interest. The possibility of accumulating and forwarding unused dividend allowances represents an option on expected future tax savings. This provides incentives to establish companies mainly for the purpose of accumulating dividend allowances. Due to high dividend allowances under the simplification rule beginning in 2006 and the reduced dividend tax rate, the option value increased considerably after that year. In our data, we define a corporation as a *shell company* if it has no turnover and if it is not a holding company.<sup>9</sup>

# 3 Data and Variable Definitions

## 3.1 Data Sample

We use the Firm Register and Individual Database and the entire sample of income tax returns provided by Statistics Sweden. This data set is a combination of three main data sources: corporate tax statements, individual income tax statements, and the K10-Form. Each owner of a CHC files a K10-Form for each CHC in which that owner actively participates. This filing requirement enables us to link corporate tax data and individual tax returns. Figure 1 illustrates the linking procedure.

[Insert Figure 1 about here]

The first data set comprises a full sample of all corporations registered in Sweden for the period 2000–2009 (referred to as the *corporate tax data*). The corporate tax data are a panel data set based on corporate tax returns from the obligatory *INK 2* form filed by all listed and unlisted corporations.<sup>10</sup> The tax returns include information on tax balance sheet items and profit and loss statements. We drop observations where a corporation filed two or more

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<sup>9</sup> This definition is apparently at odds with the legal definition of an active owner, as there is no profit generation. Nevertheless, we observe that owners of these firms claim and accumulate dividend allowances over a period of years.

<sup>10</sup> See, for example, <http://www.skatteverket.se/download/18.f273d1c11967381d5480001443/200217.pdf> for a corporate income tax declaration for 2009 (retrieved January 18, 2013).

tax statements in a single year. We further exclude firm-years with negative total assets, nominal capital, sales, turnover, scheduled depreciation, and observations where information on dividends, share capital, and organizational form are missing. Finally, we exclude central banks, funds, foundations, and government-owned entities. Using this sample, we identify tax avoidance firms based on tax balance sheet data. We then link this information to the K10-Form data, the second pillar of our data set. For 259,830 firms, we have unique identifiers from the corporate tax data, which we can successfully link to the K10-Form data, thereby identifying some 61% of all Swedish corporations as CHCs. In the final step, we link information from the corporate data (our tax avoidance measures) and the K10-Form data (identification of CHC owners) to the panel of individuals.

This third and main data source is a panel data set of individual income tax statements of the entire Swedish population. For the panel data, we have 2,145,162 successful links to the K10-Form data. That is, about 3.6% of the population are active owner-managers in a CHC. We exclude a number of observations in two steps. First, we exclude observations with missing information on age, gender, marital status, and income for at least three consecutive years. We also censor extreme observations outside the 0.01 and 99.99 percentiles of the income distribution, to remove outliers. Second, we include only observations where the individual's age is between 18 and 70. This yields our final sample of 59,483,618 observations and 7,190,676 individuals. Table 4 presents summary statistics and variable definitions.

[Insert Table 4 about here]

## 3.2 Variable definitions

### 3.2.1 Dependent variables

We use three proxies of tax avoidance as our dependent variables, based on the definitions of tax planning firms in the preceding section: holding companies, low-turnover companies, and shell companies. Owing to our unique data structure, we are able to observe directly the behavior and purpose of a corporation. We then link the status of the firm to the owner. The dummy variables *Holding Firm Owner*, *Low-turnover Firm Owner*, and *Shell Firm Owner* take the value 1 if an individual owns a CHC defined as a holding company, low-turnover

company, or shell company, respectively, and zero otherwise. As shown in Table 4, 0.33% of individual-year observations are owners in low-turnover companies, 0.24% are owners in holding companies, and even fewer are owners in shell companies (0.07%). This shows that only very few individuals own such tax avoidance firms, in total 0.64% of all individual-year observations. However, when restricting the sample to CHC owners (3.6% of the sample), approximately 18% of all CHC owners are tax-avoidance firm owners. Put differently, while owners of tax-planning firms make up only a tiny fraction of the population, they are a sizable proportion of owners of CHCs.

### 3.2.2 Incentives for tax avoidance

Individuals participate in legal tax avoidance if the expected benefits exceed the costs associated with tax avoidance. The benefit of tax avoidance is the expected reduction in tax payments, and thus an increase in disposable income. In turn, the costs can include monetary outlays to access the tax avoidance strategy, for example, fees for tax consultants and cost of time; these costs can also comprise other non-pecuniary costs, such as tax morale (Andreoni, Erard, and Feinstein, 1998; Fortin, Lacroix, and Villeval, 2007). In contrast to tax evasion with penalties for detected evasion, tax avoidance is influenced more by the tax rate, as there are no penalties for “unsuccessful avoidance.”

In our case, if an individual’s income is below the state tax threshold, that individual is subject only to the municipality tax. In this case, the difference in the top marginal tax rates on dividends and labor income is negative. Labor income is then the income source that is taxed at a lower rate. If a taxpayer is, however, subject to the first level of the state tax of 20%, the incentives change. The difference in the top marginal tax rate is positive. Income in excess of the state tax threshold is least taxed if it is earned as capital income. Only in this case do individuals derive tax benefits from owning a low-turnover firm that can outweigh one-time and recurring costs of running such a firm. We thus operationalize the tax incentive effect on tax avoidance using a simple dummy variable, *State Tax 1*<sub>*t*-1</sub>, which takes the value 1 if the individual was subject to the state tax of 20% in the preceding year, zero otherwise. Table 4 shows that only 17% of Swedish taxpayers are subject to the first level of this central government tax. An additional 5% of individuals are subject to the top

income tax (*State Tax 2*), which results in a total top marginal tax burden on labor income of about 67%. In other words, less than a quarter of our sample potentially has monetary incentives to own a low-turnover tax avoidance firm.

### 3.2.3 Access to tax avoidance

Another explanation for the observation that not all individuals with tax incentives participate in income-shifting firms relates to access to tax avoidance. In many cases, several actions are necessary to participate in tax avoidance, for example, setting up a company, becoming self-employed (for example, Kleven et al., 2011; Pirttilä and Selin, 2011; Shaw, Slemrod, and Whiting, 2010; Thoresen and Alstadsæter, 2010), or owning stock options (Goolsbee, 2000). An owner-manager of a firm can determine the tax-minimizing combination of wages and capital income. Such income shifting opportunities are, however, limited for employees, who must negotiate with the employer.

To a certain extent, the nature of employment determines whether an individual can participate in income-shifting. To shift income from labor to the capital income tax base, an individual needs to cooperate with the employer. Instead of paying a wage, the employer partly compensates the employee through the employee's tax sheltering firm. Since we have information on job occupation, we can analyze cross-sectional differences in access to income-shifting. Specifically, we argue that consultants and accountants can more easily cooperate with their employer on selecting the channel for payout of compensation for their labor. In contrast, public employees working for a central or local government have little access to such income-shifting, since the employer (the government) is unlikely to collude (see, for example, Kreiner, Leth-Petersen, and Skov, 2013; Romanov, 2006).

We define a *Consultant* as an individual working for a management consulting company, a software or hardware consulting company, or a marketing consulting company. The job occupation *Accountant* covers accountants, auditors, and tax consultants. A *Public Employee* is an individual working for a state or local government administration. Since about 3% of our individual-year observations comprise accountants and consultants, (easier) access to income-shifting appears to be limited.

### 3.2.4 Awareness of tax avoidance

A growing literature emphasizes tax awareness as a source of heterogeneity in participation in tax avoidance. The taxpayer's awareness of tax rules depends on the salience of taxes, the accessibility of information about the tax system, and the individual's ability to process information (Chetty, Looney, and Kroft, 2009; Finkelstein, 2009; Goldin and Homonoff, 2013). As a consequence, individuals may be unaware of the incentive to participate in tax-minimizing strategies. For example, Slemrod, Blumenthal, and Christian (2001), surprisingly, find indications of increased tax minimization among high-income individuals following a written audit threat. The audit letter appears to raise awareness of tax payments and, subsequently, increases participation in tax minimization. Slowness in adapting to changing income levels may also explain why not all individuals respond to tax incentives (Jones, 2012). Similarly, procrastination and inattention are reasons why, for example, not all individuals participate fully in legal estate tax planning (Kopczuk, 2007) or why labor supply responses are low (Chetty, 2012).

We include several observable individual characteristics that correlate with awareness. We expect that individuals with higher education in either business (*Business Degree*) or law (*Law Degree*) have stronger awareness of the tax code and tax avoidance opportunities, and thus are more likely to own a firm used for tax planning.<sup>11</sup> We expect native speakers to be better able to process details of the Swedish tax codes than foreign-born individuals. Finns, Norwegians, or Danes can more easily understand the Swedish language and tax code than individuals from more distant countries.<sup>12</sup> We include dummy variables indicating whether an individual was born in Sweden, born in another Nordic country, or born in Asia.

Alstadsæter, Kopczuk, and Telle (2013) show that informal spreading of information within families is important to participation in tax-avoidance strategies. We use a variable indicating whether either parent has been a business owner *Business Mother* and *Business Father*, as proxies for knowledge on business and tax rules in families. We expect these variables to be positively associated with tax avoidance participation.

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<sup>11</sup> There is, unfortunately, no information in the data on whether the tax statement was prepared by a tax consultant.

<sup>12</sup> Norwegian, Danish and Swedish are similar languages. While the Finnish language is very different from Swedish, Swedish is an official language in Finland and a mandatory subject in school.

Our main variable of awareness, which we analyze in detail, relates to geographic differences in tax knowledge. Chetty, Friedman, and Saez (2013) document that geographic differences in tax knowledge partly explain cross-sectional differences in Earned Income Tax Credit refunds. We expect that, in regions with high levels of tax-related knowledge, the individual taxpayer is more likely also to participate in tax avoidance. Sweden has 290 municipalities, which are lower-level local government entities. We have information on each individual's municipality of residence and the municipality of the employer. We use the percentage of holding companies, low-turnover companies, and shell companies, respectively, as proxies for general tax avoidance awareness in a municipality. This percentage is based on the entire population, excluding the specific individual to avoid a mechanical relation.

If more individuals in a municipality own income-shifting firms, we would expect that information on tax incentives, tax rules, and on how to establish an income-shifting firm is more readily available and spreads more quickly. In other words, this information more easily flows through informal channels. This means that we expect a higher density of tax sheltering firms in a municipality to positively affect an individual's likelihood of participating in tax avoidance. In Sections 4.2.3 and 4.3, we exploit these regional differences in tax avoidance and use this measure for awareness based on information diffusion within social networks.

## 4 Empirical evidence on tax avoidance

Our empirical strategy is threefold. First, we analyze the cross-sectional correlates of tax avoidance participation using the entire sample, to document what characterizes tax avoiders. Second, we exploit the 2006 tax reform in a DD analysis to generate evidence on the impact of incentives, access, and awareness on tax avoidance participation. Third, we utilize differences across geographic areas in the density of tax avoidance activities to identify the effect of awareness and flow of information in informal networks on participation in tax avoidance.



## 4.1 Characteristics of income shifters

We first analyze which variables are associated with participation in tax avoidance by utilizing the entire cross-sectional variation in the data. The likelihood of owning an income-shifting firm and the impact of various explanatory variables are analyzed with the following logit model:<sup>13</sup>

$$Shifter_{i,t} = \beta_1 + \theta\mathbf{\Gamma}_{i,t} + \beta_c + \beta_t + \epsilon_{i,t} \quad (1)$$

where  $Shifter_{i,t}$  is the dependent variable. We run three different analyses, where  $Shifter_{i,t}$  equals 1 if the individual is an active owner in (1) a shell firm, (2) a low-turnover firm, or (3) a holding firm. Regression results are presented separately for these analyses in Table 5 and in columns (1), (2), and (3), respectively. The individual-level variables, denoted by the vector  $\mathbf{\Gamma}_{i,t}$ , include income and demographic variables, as discussed above. We include county-fixed effects  $\beta_c$ , and year-fixed effects  $\beta_t$  as explanatory variables. The statistical inference is based on heteroskedasticity-robust standard errors clustered at the individual level.

Table 5 presents coefficient estimates for the individual-level variables. There is a positive association between proxies for having *incentives* to own a tax shelter based on income in the preceding year (*Average Income*, *State Tax 1*, and *State Tax 2*), and the probability of owning an income-shifting firm. This result is robust across types of income-shifting firms. Being subject to the state tax is positively associated with participating in income-shifting, which is consistent with our expectations. *Ceteris paribus*, individuals subject to a higher marginal tax rate have incentives to own a tax planning company. Yet, there are concerns that this dummy variable is correlated with other variables. For example, it could capture an income effect (high versus low income) instead of a tax effect. We address this concern in Section 4.2.1 below, using DD regressions exploiting the 2006 tax changes as exogenous event.

Individuals with easier *access* to income-shifting (accountants and consultants) are more likely to own a firm used for tax planning. At the same time, public employees are less likely to shift income across tax bases, due to lack of access, since the employer, that is, the

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<sup>13</sup> Results are similar when we use OLS or probit models.

government, is unlikely to cooperate in income shifting. Results are significant for all types of income-shifting firms.

Finally, our cross-sectional tests of variables related to *awareness* have the expected associations with owning a tax shelter. Having a type of higher education that is expected to give more knowledge of the tax system, that is, a (*Business Degree* or *Law Degree*), is positively associated with owning an income-shifting firm. However, we cannot interpret our results as indicating a causal link between education and income shifting, because these dummy variables capture many dimensions. For example, an individual with a business degree may not only have greater knowledge about tax rules through education, but also stronger individual preferences for business matters, at least compared with graduates in other disciplines. Similarly, having a parent who is a business owner is positively associated with owning an income-shifting firm. This can be interpreted as an indication of knowledge spillover within the family network and of the importance of awareness to participation in income shifting. We also find some evidence that individuals born in Sweden have a higher association with tax avoidance participation than individuals born in other Nordic countries. Differences in tax sheltering activity stem from differences in processing language information rather than from cultural differences with respect to tax avoidance. Below, we address concerns about these variables as proxies for awareness and identify awareness using differences in tax avoidance across geographic areas.

When considering other demographic factors, there is a consistent indication that men are more likely to own tax planning firms. Also, owning a tax planning firm is positively associated with being married, having children, and being older.

[Insert Table 5 about here]

## 4.2 Impact of incentives, access and awareness

Since we can draw no causal inference from the results in Table 5, we next turn to an identification strategy that uses the 2006 tax reform as an exogenous shock to tax avoidance opportunities. While the cross-sectional analysis in Table 5 provides external validity that our incentive, access, and awareness proxies correlate as expected with tax avoidance par-

icipation, we next estimate the effect of incentives, access and awareness on participation in legal tax avoidance by exploiting the 2006 tax reform as a quasi-natural experiment. We estimate the following DD model:

$$Shifter_{i,t} = \beta_1 + Post_t \times X_{i,t} + \theta \mathbf{\Gamma}_{i,t} + \beta_i + \beta_c + \beta_t + \epsilon_{i,t} \quad (2)$$

where  $Post_t \times X_{i,t}$  is the DD coefficient, with  $X_{i,t}$  denoting the treatment group. We subsequently use three different definitions for the treatment group that separately measure incentives, access, and awareness. Vector  $\mathbf{\Gamma}$  denotes the vector of individual-level control variables from Equation (1). We include individual fixed effects, year fixed effects, and state fixed effects in all regressions. Individual fixed effects additionally account for time-invariant differences in individual characteristics between treatment and control groups. In all three cases below, we use two different definitions of the dependent variables ( $Shifter_{i,t}$ ). First, we use a dummy variable equal to 1 if the individual owns a tax avoidance company. Second, we use a dummy variable equal to 1 if the individual establishes a tax avoidance company in the specific year. In Figure 2, we present the general trend in tax-shelter firms. Figure 2 depicts the percentage of CHCs designed for income-shifting purposes, according to our definitions, among newly registered CHCs.

Insert Figure 2 about here

The percentage of holding companies, low-turnover firms, and shell corporations increases in 2006 and remains at a higher level post-reform. The percentage of new firms that are shell corporations (low-turnover firms) increases to about 5% (more than 10%) following the reform. In 2006, we categorize more than 20% of newly founded firms as holding companies. In sum, about one-third of all newly founded CHCs in 2006 are some kind of income-shifting vehicle. This is a first indication that tax avoidance increased following the 2006 reform. Note that the 2004 increase in holding companies is very likely to be tax-related. The tax-exemption for dividends and capital gains at the corporate level from unlisted shares was introduced in this year. In the subsequent analysis, we examine which individuals are more likely to own/establish these tax-shelter firms.

### 4.2.1 Incentives and tax avoidance participation

If tax incentives drive legal tax avoidance, individuals with a marginal income tax rate of 51% or higher should be more likely to participate in income shifting than individuals with a lower income tax. Since the 2006 tax reform increases the amount of income that can be shifted from labor income to capital income, we expect that individuals with a high tax rate increase tax avoidance activities around the reform relative to individuals with a lower income tax rate.

Accordingly, we define the treatment group,  $X_{i,t}$ , as individuals with an income tax of 51% or higher in the previous year ( $High\_Tax = 1$ ). Table 6 presents the resulting DD coefficients from estimating Equation (2). As expected, the  $Post \times High\_Tax$  coefficient is positive and significant in all specifications. Table 6 also presents the *Treatment Effect*, which we define as the ratio of the DD coefficient to the unconditional pre-reform average. In other words, the *Treatment Effect* expresses the effect of the reform on tax avoidance as a percentage of the pre-reform average.

We find that individuals with an incentive to shift income have a higher likelihood of owning and establishing tax-shelter companies than individuals without a tax incentive. The economic effects of this are substantial. For example, the likelihood of establishing a low-turnover firm (shell-corporation) increases by 204% (140%) around the tax reform if an individual is subject to high income taxation. While this result appears to be very large at first glance, recall that the 2006 tax reform substantially increased the amount of income that can be shifted from labor to capital income through low-turnover firms as the dividend allowance increased substantially. Moreover, the dividend tax rate was cut by 10 percentage points. Therefore, the large effect on establishing income shifting firms is a consequence of the 2006 tax reform. Our results indicate that tax incentive plays an important role in the tax avoidance decision.

[Insert Table 6 about here]

### 4.2.2 Access and tax avoidance participation

The second friction, apart from any incentive effects, relates to access to tax avoidance. Our cross-sectional results indicate that there is a positive correlation between tax avoidance and certain job occupations. In the DD setting, we test whether individuals in two job occupations, accountant and consultant, respond more strongly to the reform than individuals in other job occupations. To this end, we define the treatment group,  $X_t$ , as individuals with access to tax avoidance. In particular, we set  $Access_{i,t}$  to 1 if the individual is a consultant or an accountant. Note that  $High-Tax_{i,t-1}$  is included in the vector of control variables to account for differences in tax incentives.

Table 7 presents the resulting DD coefficients from estimating Equation (2). The DD coefficient,  $Post \times Access$ , is positive and significant in all specifications. We find that individuals with access to income shifting have a higher likelihood of owning and establishing tax-shelter companies than individuals without easy access. Again, the economic effects are large. For example, the likelihood of establishing a low-turnover firm (shell-corporation) increases by 129% (287%) around the tax reform if the individual is an accountant or a consultant and thus has the opportunity to shift income through a low-turnover corporation, thanks to the nature of the job occupation.

[Insert Table 7 about here]

### 4.2.3 Awareness and tax avoidance participation

To test the effect of awareness on tax avoidance, we exploit regional differences in tax avoidance across Sweden's 290 municipalities and use a more exogenous measure for awareness based on information diffusion within social networks (Alstadsæter, Kopczuk, and Telle, 2013; Chetty, Friedman, and Saez, 2013). We have information on each individual's municipality of residence and use the percentage of holding companies, low-turnover companies, and shell companies, respectively, as proxies for local awareness of tax avoidance. We denote these variables  $Density Holding$ ,  $Density LT$ , and  $Density Shell$ , respectively.

In our DD setting, we define treatment and control groups as follows: When we use ownership (and establishment) of a low-turnover corporation as the dependent variable, we

define the treatment group  $X_{i,t}$  as individuals that reside in a municipality with a high density of low-turnover corporations. The control group comprises individuals in a municipality with a low density of such corporations. High and low density are defined as the top and bottom quartile of the *Density LT* distribution. Since we measure *Density LT* at the municipality level, the size of the treatment and control groups differs. We then repeat this procedure separately for holding and shell corporations. Further, since there are cross-municipality differences in *Density Holding*, *Density LT*, and *Density Shell*, the number of observations varies across specifications. In all regressions, we control for our access and incentive variables to ensure that we estimate the additional effect of awareness on the decision to participate in tax avoidance

Table 8 presents the resulting DD coefficients from estimating Equation (2). The DD coefficient,  $Post \times High\ Density$ , is positive and significant in all specifications. We find a strong and positive effect from information within a network on the individual’s likelihood of establishing a tax-shelter company. The economic effects are still large, but smaller than in the previous regressions. For example, the likelihood of establishing a low-turnover firm (shell-corporation) increases by 16% (55%) around the tax reform if the individual resides in a municipality with a high density of tax avoiders.

[Insert Table 8 about here]

Taken together, the three DD results show that there are several frictions in the tax avoidance decision. Not only monetary benefits from tax avoidance (*incentive*), but also the opportunity to participate in tax avoidance (*access*), as well as information and knowledge about tax avoidance opportunities (*awareness*) explain why individuals participate in tax avoidance.

### 4.3 Awareness and networks

After having tested the effect of regional differences in tax avoidance on the individual’s decision to avoid taxes in a DD setting, we next validate our measure of awareness—geographic differences in tax knowledge—in two steps. First, we show that the density of tax sheltering firms is positively correlated with the individual’s likelihood of owning such a firm. We use

a logit regression to analyze the impact of the density of tax sheltering firms in the municipality of residence on the likelihood of owning a tax sheltering firm following Equation (1). As additional regional control variables, we include the density of accountants, density of consultants, unemployment rate, and population size (as a natural logarithm). Columns (1), (4), and (7) in Table 9 display results from logit regressions of estimating the probability of owning a shell company, low-turnover company, and holding company, respectively. The results indicate that the network effect, proxied by the density of income-shifting firms in the municipality of residence, is positive and significant for all three measures of income shifting. The economic magnitudes are significant. For example, a one standard deviation increase in the density of low-turnover firms in a municipality (in  $t - 1$ ) is associated with an increase in the likelihood of owning a low-turnover corporation by about 13%.<sup>14</sup>

The second step in our identification strategy exploits differences in exposure to informal information channels across individuals. For example, Chetty, Friedman, and Saez (2013) use information on individuals moving across states. We use another source of variation and exploit information on the income-shifting density in both the municipality of residence and the municipality of the employer. If an individual lives and works in the same municipality (non-commuter), we expect the impact of the density of income shifters in this municipality on owning a tax-shelter firm to be stronger for non-commuters than for commuters. The reason for this is that a non-commuter is exposed to local information through the workplace and through neighbors and other networks within the municipality. In contrast, a commuter is exposed only to non-work related information channels. We thus include an indicator variable for working and living in the same municipality (*Non-Commuter*), as well as an interaction between the density of tax-shelter firms and *Non-Commuter*.

Results are displayed in columns (2), (4), and (6) in Table 9. We find that the main effect of *Non-Commuter* indicates a positive association with the probability of participating in a tax-shelter firm. Most importantly, the interaction term between the density of income shifters in the municipality and being a non-commuter is positive. This indicates that the municipality information diffusion effect is stronger for individuals working and living in the

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<sup>14</sup> We standardize densities to have a mean of zero and a standard deviation of 1 to simplify interpretation of the results.

same municipality. Awareness of tax incentives thus appears to be an important explanation for why some individuals participate in income shifting and others do not. Again, the economic magnitudes are significant. For example, the baseline effect of a one standard deviation increase in the density of low-turnover firms in a municipality is associated with an increase in the likelihood of owning a low-turnover corporation by 10.8%. If an individual lives and works in the same region, this effect increases by 46% to 15.8%.

Finally, we exploit whether commuters also respond to the density of tax avoidance in the municipality in which the employer is located. Commuters are exposed to two different municipalities. If information channels are responsible for the observed effect, then commuters should be responsive to the density of tax avoidance activities in their municipality of residence and in their municipality of work. To empirically test this potential spillover mechanism, we rerun the regressions from columns (1), (4), and (7) and include a dummy variable *Commuter*. *Commuter* is equal to 1 if the individual does not live and work in the same municipality, and zero otherwise. We additionally interact *Commuter* with the difference in tax avoidance density between the municipalities of residence and work, denoted by  $\Delta$ . Regression results are presented in columns (3), (6), and (9). Results indicate that both information channels, at the location of residence and of the employer, matter. The network effect of the location of residence is positive and significant in all specifications for all three measures of income shifting. We additionally find that the likelihood of owning a tax-sheltering firm increases when commuters face a higher density of tax avoidance in the municipality of work than in the municipality of residence.

In sum, the results in Tables 8 and 9 show that the likelihood of participating in tax avoidance is driven by the density of income shifting activities in the local geographic area. The effect of municipality of residence is stronger if the individual lives and works in the same region. Commuters' likelihood to participate in tax avoidance is affected by two locations: the municipality of residence and the municipality of work. Overall, these results suggest that the likelihood of tax avoidance participation is a function of tax awareness and the flow of tax-related information through networks.

[Insert Table 9 about here]



## 5 Conclusion

This paper examines empirically why not all individuals exploit tax avoidance opportunities. These reasons can be categorized as incentive, access, and awareness. Utilizing rich Swedish microdata and a tax reform, we find a positive effect from monetary incentives on the probability of owning a firm that facilitates tax avoidance and income shifting. Individuals with easier access to income shifting, such as accountants and consultants, are more likely to own a firm that facilitates tax planning, while public employees are less likely to own a tax-shelter firm. Finally, we show that awareness is an important source of heterogeneity in participation in income shifting. Our identification strategy exploits regional differences in tax avoidance participation, along with information on commuters and non-commuters. The network effect, proxied by the density of income-shifting firms in the municipality of residence, is positive and significant. The effect of the local network is stronger for non-commuters who live and work in the same municipality. Awareness by commuters is additionally influenced by the density of tax avoidance in the municipality in which the employer is located.

These results have important policy implications. If mainly high-income individuals benefit from legal tax avoidance, income inequality increases and vertical equity is reduced. In addition, horizontal equity is reduced, as only informed individuals with awareness of tax changes and access to income shifting react to tax incentives. This is relevant for tax authorities when designing and communicating tax reforms. If tax rules are overly complex and the resulting incentives are not transparent, unintended effects can occur when awareness of incentives is concentrated among informed, highly taxed individuals. Studying the welfare consequences of heterogeneity in legal tax avoidance is an interesting avenue for further research.

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Figure 1: Linking of Corporate and Income Tax Information via K10 Forms

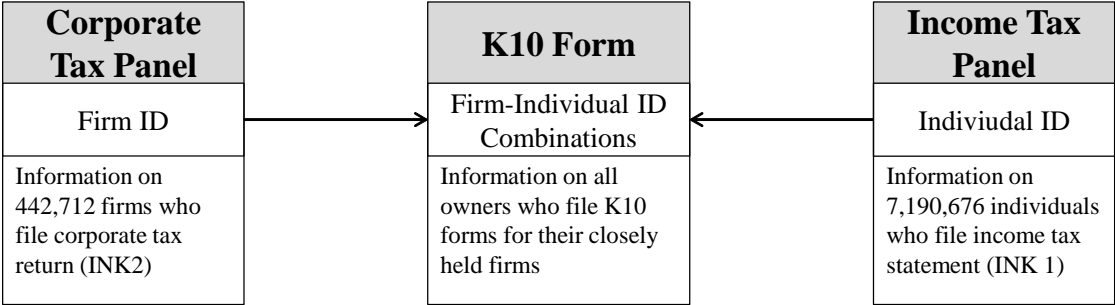
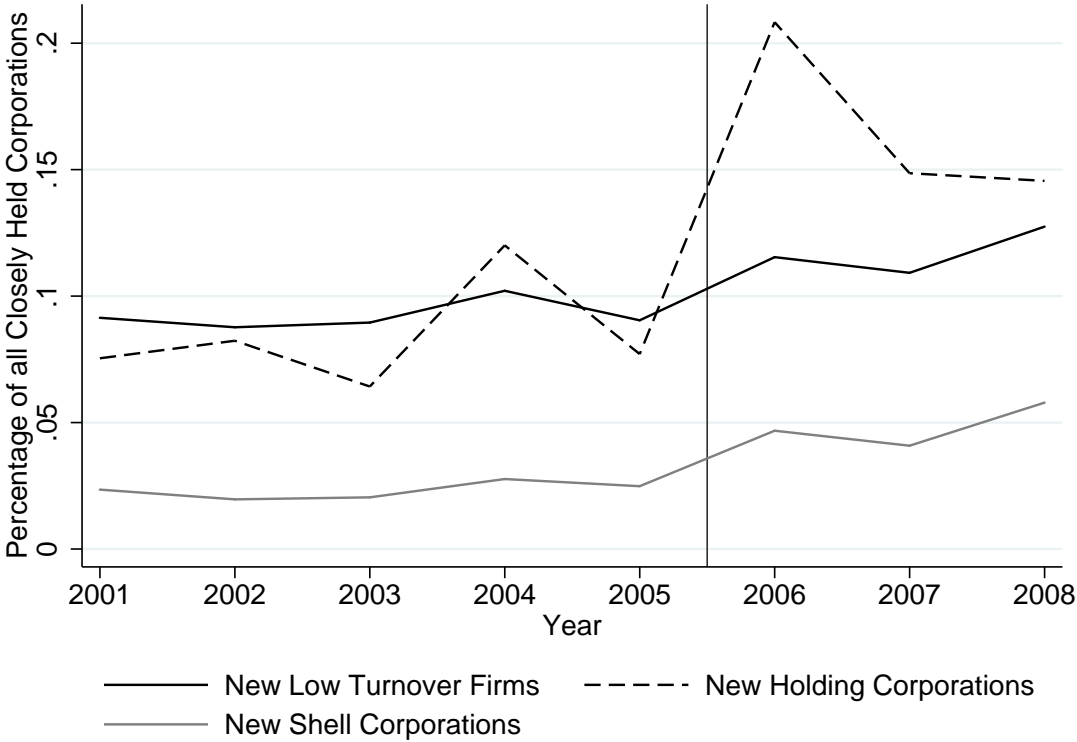


Figure 2: Shell, Low-Turnover, and Holdings Corporations, 2001–2008



**Table 1: Marginal tax rates and thresholds in Sweden, 2000–2009**

Year	Labor income						Capital income		
	Municipality tax	State tax1	Threshold for state tax 1	State tax 2	Threshold for state tax 2	Social security <sup>a</sup>	Corp. Tax	Dividend WHC <sup>b</sup>	Dividend CHC <sup>c</sup>
2000	30.4	20	254,600	5	398,500	32.9	28	30	30
2001	30.5	20	271,500	5	411,100	32.8	28	30	30
2002	30.5	20	290,100	5	430,900	32.8	28	30	30
2003	31.2	20	301,000	5	447,200	32.8	28	30	30
2004	31.5	20	308,800	5	458,900	32.7	28	30	30
2005	31.6	20	313,000	5	465,200	32.5	28	30	30
2006	31.6	20	317,700	5	472,300	32.3	28	25 / 30	20
2007	31.6	20	328,600	5	488,600	32.4	28	25 / 30	20
2008	31.4	20	340,900	5	507,100	32.4	28	25 / 30	20
2009	31.5	20	380,200	5	538,800	31.4	26.3	25 / 30	20

The thresholds for the first and second levels of state tax are defined in Swedish krona (SEK). In 2006, USD 1 equaled SEK 7.38.

<sup>a</sup> Social security contributions are remitted by the employer at the corporate level.

<sup>b</sup> As of 2006, dividends from unlisted, widely held firms are taxed at 25%. Dividends from listed firms are taxed at 30%.

<sup>c</sup> Dividends exceeding the dividend allowance are taxed as labor income in all years. Until 2005, there was a small proportion of dividends that was tax-exempt. This was equal to 0.7 times the interest rate on government bonds times nominal equity.

**Table 2: Income composition: Holding Firm Owners**

This table presents changes in income of holding owners relative to closely held corporation (CHC) owners estimated over the period 2002–2009. As a comparison group for holding owners, we use a matched sample of CHC owners that participate in no income shifting firms over the sample period. We use an exact one-on-one matching procedure without replacement with respect to average income, *State Tax*, and demographic characteristics (see Table 4 for an overview and description of all variables). Matching is based on pre-2006 values. Standard errors (shown in parentheses) allow for heteroskedasticity clustered at the individual level. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

	Total Income w/o Turnover (1)	Total Income with Turnover (2)	Labor Income (3)	Dividends from CHC (4)	Dividends & Interest (5)
Relative Change in SEK	-7,778 (6,467)	-6,011 (6,502)	2,926 (2,556)	31,528*** (2,522)	-16,310*** (2,793)
Controls	Yes	Yes	Yes	Yes	Yes
Year-FE	Yes	Yes	Yes	Yes	Yes
County-FE	Yes	Yes	Yes	Yes	Yes
Observations	138,501	138,501	138,501	138,501	138,501

**Table 3: Income composition: Low-Turnover Firm Owners**

This table presents changes in income of low-turnover firm owners estimated over the period 2002–2009. Our group consists of low-turnover firm owners that actively participate in a low-turnover firm after 2006. These are individuals employed before the tax reform of 2006. As a comparison group to low-turnover firm owners that actively participate in a low-turnover firm after 2006, we use a matched sample of employed individuals that do not participate in a closely held corporation (CHC). Low-turnover firm owners are employed prior to 2006. We use an exact one-on-one matching procedure without replacement with respect to average income, *State Tax*, and demographic characteristics (see Table 4 for an overview and description of all variables). We match on pre-2006 values. We present relative income change estimates for total income without and with firm turnover, labor income, and capital income (without capital gains and losses). Standard errors (shown in parentheses) allow for heteroskedasticity clustered at the individual level. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

	Total Income w/o Turnover	Total Income with Turnover	Labor Income	Capital Income
Relative Change in SEK	2,148 (3,878)	4,784 (3,906)	-15,600*** (3,316)	18,120*** (1,986)
Controls	Yes	Yes	Yes	Yes
Year-FE	Yes	Yes	Yes	Yes
County-FE	Yes	Yes	Yes	Yes
Observations	69,826	69,826	69,826	69,826

**Table 4: Summary Statistics**

This table presents descriptive statistics of our main variables for the representative panel of individuals over the 2002–2009 sample period. *Average Income<sub>t-2,t</sub>* is average income over three periods, excluding income from the closely held corporations (CHC). *State Tax 1* (*State Tax 2*) 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% (additional top tax of 5%). *Labor Income* (*Interest Income*) comprises all wages and salaries (interest income). *Dividends* includes dividends from all sources. *Business150* (*Business20*) is a dummy variable equal to 1 if income from self-employment in the preceding year exceeds SEK 150,000 (SEK 20,000). *Born in Sweden*, *Born in Nordic*, and *Born in Asia* are indicator variables equal to 1 if the taxpayer was born in Sweden, in the other Nordic countries, or in Asia, respectively. *Age* is the taxpayer’s age in years. *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 in the household. *Consultant* is a dummy variable equal to 1 if the individual works as a consultant in the IT, business, or marketing sectors. *Accountant* is a dummy variable equal to 1 if the individual works in an accounting, book-keeping, or tax consulting firm. *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. *Public Employee* is a dummy variable equal to 1 if the individual works in the public administration of central or local governments. *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). *Father Business* is an indicator variable equal to 1 if the father (mother) of the individual owned a business or a CHC in any of the preceding 10 years. *Shell Owner* is a dummy variable equal to 1 if the taxpayer actively participates in a shell firm with no turnover. *Low-Turnover Owner* is a dummy variable equal to 1 if the individual actively participates in a low-turnover firm. *Holding Owner* is a dummy variable equal to 1 if the individual actively participates in a CHC that is a holding firm.

Variable	N	Mean	Standard Deviation	10th Percentile	Median	90th Percentile
<b>Panel A: Income Elements</b>						
Average Income <sub>t-2,t</sub>	59,483,618	219,061	739,540	35,100	195,133	370,967
State Tax 1	59,483,618	0.1745	0.3795	0.0000	0.0000	1.0000
State Tax 2	59,483,618	0.0477	0.2132	0.0000	0.0000	0.0000
Labor Income	59,483,618	191,094	199,788	0	188,448	377,604
Interest Income	59,483,618	1,976	225,413	0	0	2,966
Dividends	59,483,618	4,410	718,923	0	4	3,596
Business20	59,483,618	0.3932	0.4885	0.0000	0.0000	1.0000
Business150	59,483,618	0.1098	0.3126	0.0000	0.0000	1.0000
<b>Panel B: Demographic Characteristics</b>						
Born in Sweden	59,483,618	0.8587	0.3483	0.0000	1.0000	1.0000
Born in Nordic	59,483,618	0.0347	0.1831	0.0000	0.0000	0.0000
Born in Asia	59,483,618	0.0352	0.1843	0.0000	0.0000	0.0000
Age	59,483,618	43.4815	14.6397	23.0000	43.0000	64.0000
Female	59,483,618	0.4942	0.5000	0.0000	0.0000	1.0000
Married	59,483,618	0.4335	0.4956	0.0000	0.0000	1.0000
Number Children	59,483,618	0.6153	0.9787	0.0000	0.0000	2.0000
Consultant	59,483,618	0.0237	0.1522	0.0000	0.0000	0.0000
Accountant	59,483,618	0.0048	0.0688	0.0000	0.0000	0.0000
Public Employee	59,483,618	0.0262	0.1598	0.0000	0.0000	0.0000
Tertiary Education	59,483,618	0.1409	0.3479	0.0000	0.0000	1.0000
Business Degree	59,483,618	0.1056	0.3073	0.0000	0.0000	1.0000
Law Degree	59,483,618	0.0076	0.0868	0.0000	0.0000	0.0000
IT Degree	59,483,618	0.0115	0.1067	0.0000	0.0000	0.0000
Father Business	59,483,618	0.1656	0.3718	0.0000	0.0000	1.0000
Mother Business	59,483,618	0.1059	0.3078	0.0000	0.0000	1.0000
<b>Panel C: Statistics on CHC Owners</b>						
CHC	59,483,618	0.0361	0.1865	0.0000	0.0000	0.0000
Shell Owner	59,483,618	0.0007	0.0257	0.0000	0.0000	0.0000
Low-Turnover Owner	59,483,618	0.0033	0.0574	0.0000	0.0000	0.0000
Holding Owner	59,483,618	0.0024	0.0492	0.0000	0.0000	0.0000

**Table 5: Individual Characteristics and Tax Avoidance Strategies**

This table presents the results for income shifting behavior estimated over the period 2002–2009. Columns (1) to (3) present coefficient estimates using different dimensions of income shifting as dependent variables. All dependent and independent variables are as described in Table 2. Standard errors (shown in parentheses) allow for heteroskedasticity clustered at the individual level. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

	Shell Corporation		Low-Turnover Corporation		Holding Corporation	
	(1)	(2)	(1)	(2)	(3)	(4)
	Coef.	(s.e.)	Coef.	(s.e.)	Coef.	(s.e.)
Average Income $_{t-2,t}$	0.0037***	(0.0013)	0.0056***	(0.0010)	0.0169***	(0.0015)
State Tax1	0.8122***	(0.0255)	0.5691***	(0.0121)	1.5426***	(0.0145)
State Tax2	0.5088***	(0.0277)	0.4474***	(0.0144)	0.7367***	(0.0149)
Business20	0.2426***	(0.0221)	0.1207***	(0.0102)	0.4280***	(0.0120)
Business150	0.1222***	(0.0276)	0.1992***	(0.0127)	-0.0017	(0.0148)
Accountant	0.8423***	(0.0792)	1.0101***	(0.0360)	0.7839***	(0.0448)
Public Employee	-1.2589***	(0.1120)	-0.6356***	(0.0377)	-1.8148***	(0.0842)
Consultant	0.3916***	(0.0405)	0.5268***	(0.0192)	0.4251***	(0.0223)
Born in Sweden	0.3121***	(0.0586)	0.4571***	(0.0293)	0.8383***	(0.0470)
Born in Nordic	-0.2172**	(0.1003)	0.0017	(0.0471)	0.3584***	(0.0693)
Born in Asia	-0.2144**	(0.1077)	-0.4143***	(0.0583)	-0.3465***	(0.0996)
Business Degree	0.5665***	(0.0313)	0.5920***	(0.0151)	0.5397***	(0.0177)
Law Degree	0.6061***	(0.0777)	0.4478***	(0.0394)	0.8840***	(0.0413)
IT Degree	-0.1468	(0.1051)	0.0145	(0.0485)	-0.3828***	(0.0594)
Business Father	0.5991***	(0.0318)	0.5262***	(0.0163)	0.5933***	(0.0183)
Business Mother	0.5876***	(0.0349)	0.4871***	(0.0180)	0.5066***	(0.0200)
Age	0.0297***	(0.0011)	0.0365***	(0.0005)	0.0224***	(0.0006)
Married	0.3447***	(0.0269)	0.3537***	(0.0126)	0.4174***	(0.0157)
Tertiary Education	0.0070	(0.0318)	0.5063***	(0.0143)	-0.2431***	(0.0182)
Female	-0.9443***	(0.0299)	-0.8197***	(0.0135)	-0.8227***	(0.0180)
Number Children	0.0965***	(0.0116)	0.0624***	(0.0059)	0.1033***	(0.0067)
County FE	Yes		Yes		Yes	
Year FE	Yes		Yes		Yes	
Observations	59,483,618		59,483,618		59,483,618	
R-Squared	0.0755		0.0889		0.1579	



**Table 6: The Effect of Incentives on Tax Avoidance**

This table presents the results for income shifting behavior estimated over the period 2002–2009. Columns (1), (3), and (5) present coefficient estimates using dummy variables of owning our three different dimensions of tax avoidance firm as dependent variables. Columns (2), (4), and (6) present coefficient estimates using dummy variables of establishing a low-turnover, holding, and shell corporation, respectively, as dependent variables. We use a difference-in-difference (DD) approach around the 2006 tax reform with individuals subject to an income tax on wages above 51% in the previous year as the treatment group (*High Tax* = 1). Additional independent variables are as described in Table 2. The *Treatment Effect* is the DD estimate normalized by the unconditional pre-reform average. Standard errors (shown in parentheses) allow for heteroskedasticity clustered at the individual level. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

	Low-Turnover Corporation		Holding Corporation		Shell Corporation	
	Owning (1)	Establish (2)	Owning (3)	Establish (4)	Owning (5)	Establish (6)
Prereform Average (in %)	0.32%	0.06%	0.20%	0.04%	0.06%	0.01%
Post × High Tax	0.00141*** (0.00007)	0.00122*** (0.00003)	0.00382*** (0.00008)	0.00045*** (0.00003)	0.00055*** (0.00004)	0.00017*** (0.00002)
<b>Treatment Effect</b>	<b>44%</b>	<b>204%</b>	<b>189%</b>	<b>125%</b>	<b>90%</b>	<b>140%</b>
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	59,109,712	59,109,712	59,109,712	59,109,712	59,109,712	59,109,712

**Table 7: The Effect of Access on Tax Avoidance**

This table presents the results for income shifting behavior estimated over the period 2002–2009. Columns (1), (3), and (5) present coefficient estimates using dummy variables of owning three different dimensions of tax avoidance firm as dependent variables. Columns (2), (4), and (6) present coefficient estimates using dummy variables of establishing a low-turnover, holding, and shell corporation, respectively, as dependent variables. We use a difference-in-difference (DD) approach around the 2006 tax reform with accountants and consultants as the treatment group with simplified access to income shifting (*Access* = 1). Additional independent variables are as described in Table 2. The *Treatment Effect* is the DD estimate normalized by the unconditional pre-reform average. Standard errors (shown in parentheses) allow for heteroskedasticity clustered at the individual level. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

	Low-Turnover Corporation		Holding Corporation		Shell Corporation	
	Owning (1)	Establish (2)	Owning (3)	Establish (4)	Owning (5)	Establish (6)
Prereform Average (in %)	0.32%	0.06%	0.20%	0.04%	0.06%	0.01%
Post × Access	0.00264*** (0.00020)	0.00077*** (0.00009)	0.00441*** (0.00022)	0.00085*** (0.00008)	0.00059*** (0.00010)	0.00035*** (0.00004)
<b>Treatment Effect</b>	<b>82%</b>	<b>129%</b>	<b>219%</b>	<b>239%</b>	<b>98%</b>	<b>287%</b>
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	59,109,712	59,109,712	59,109,712	59,109,712	59,109,712	59,109,712

**Table 8: The Effect of Awareness on Tax Avoidance**

This table presents the results for income shifting behavior estimated over the period 2002–2009. Columns (1), (3), and (5) present coefficient estimates using dummy variables of owning three different dimensions of tax avoidance firm as dependent variables. Columns (2), (4), and (6) present coefficient estimates using dummy variables of establishing a low-turnover, holding, and shell corporation, respectively, as dependent variables. We use a difference-in-difference (DD) approach around the 2006 tax reform. The treatment group comprises individuals that reside in a municipality with a high density of the respective type of tax avoidance firm. The control group comprises individuals in a municipality with a low density of the respective type of tax avoidance firm. High and low density are defined as the top and bottom quartile of the respective density distribution. Additional independent variables are as described in Table 2. The *Treatment Effect* is the DD estimate normalized by the unconditional pre-reform average. Standard errors (shown in parentheses) allow for heteroskedasticity clustered at the individual level. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

	Low-Turnover Corporation		Holding Corporation		Shell Corporation	
	Owning (1)	Establish (2)	Owning (3)	Establish (4)	Owning (5)	Establish (6)
Prereform Average (in %)	0.37%	0.07%	0.22%	0.04%	0.07%	0.01%
Post × High Density	0.00052*** (0.00006)	0.00012*** (0.00003)	0.00086*** (0.00006)	0.00008*** (0.00002)	0.00015*** (0.00004)	0.00007*** (0.00002)
<b>Treatment Effect</b>	<b>14%</b>	<b>16%</b>	<b>39%</b>	<b>21%</b>	<b>20%</b>	<b>55%</b>
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	29,879,265	29,879,265	28,848,234	28,848,234	21,239,161	21,239,161

**Table 9: Networks and Awareness of Income Shifting**

This table presents logit regression results for ownership of income-shifting firms. The dependent variable is a dummy variable equal to 1 if the individual owns a shell corporation in year  $t$ . In columns 3 to 6 (columns 7 to 8), we use ownership of a low-turnover corporation (holding corporation) as the dependent variable. Our main independent variable of interest is the percentage of individuals in a municipality in year  $t-1$  that participate in income shifting. Regional variables with  $\Delta$  denote differences in density of income shifting between the municipality of work and the municipality of residence. As controls, we add socioeconomic variables (see Table 2) and year fixed effects. Standard errors (shown in parentheses) allow for heteroskedasticity clustered at the individual level. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Shell Corporation			Low-turnover Corporation			Holding Corporation		
Density Shell $_{t-1}$	0.0676*** (0.0031)	0.1610*** (0.0113)	0.0854*** (0.0035)						
Density LT $_{t-1}$				0.1243*** (0.0056)	0.1024*** (0.0063)	0.0629*** (0.0024)			
Density Holding $_{t-1}$							0.2108*** (0.0060)	0.1608*** (0.0078)	0.1071*** (0.0024)
Density Shell $_{t-1} \times$ Non-Commuter			0.0835*** (0.0149)						
Density LT $_{t-1} \times$ Non-Commuter					0.0441*** (0.0086)				
Density Holding $_{t-1} \times$ Non-Commuter								0.0712*** (0.0092)	
$\Delta$ Density Shell $_{t-1} \times$ Commuter			0.0379*** (0.0035)						
$\Delta$ Density LT $_{t-1} \times$ Commuter						0.0204*** (0.0019)			
$\Delta$ Density Holding $_{t-1} \times$ Commuter									0.0592*** (0.0027)
Non-Commuter		0.4254*** (0.0235)			0.2262*** (0.0108)			0.4945*** (0.0139)	
Commuter			-0.1148*** (0.0068)			-0.0691*** (0.0037)			-0.1579*** (0.0047)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	59,483,618	59,483,618	59,483,618	59,483,618	59,483,618	59,483,618	59,483,618	59,483,618	59,483,618
R-squared	0.0802	0.0813	0.0830	0.0909	0.0917	0.0936	0.1647	0.1684	0.1693