Dividend Tax Thresholds and Extreme Bunching

Aliisa Koivisto*

Preliminary version

August 5, 2019

Abstract

In this paper, I use panel data of all Finnish privately held corporations and their main owners to study how business owners respond to dividend taxes. By studying the effects of dividend tax schedule discontinuities on place in 2006–2016, I find exceptionally clear dividend responses to tax rates, implying taxable income elasticities between 0.5–3.6. The results indicate that majority of the payment response is due to inter-temporal income-smoothing or income-shifting across income bases, while changes in the tax schedule did not cause significant real responses in output or investment.

JEL classification codes: G20, H21, H24, H25

Keywords: Dividend taxation, dividend payments, real investment, income-shifting, bunching

1 Introduction

Understanding the mechanisms of how business owners respond to dividend taxation is essential in planning a good income tax scheme. As equity reasons entail taxing entrepreneurial income as any other income, efficiency aspects suggest the opposite. Dividend taxes reduce the return on invested capital and owner’s own work effort, hence decreasing incentives for new investments and exertion. However, business owners have many channels for adjusting their tax burden i.a. tax planning and

*VATT Institute of Economic Research and University of Helsinki
evasion, and several channels to fund investment, so the distortions could also remain small. Therefore, studying multiple responses to dividend taxation is integral for knowing the actual effects of dividend taxes.

The Finnish dividend tax schedule provides exceptionally large incentives for firms to respond. To reduce the efficiency concern, the dividend tax schedule in Finland includes deductions, effectively causing a clearly lower marginal tax rates for certain amounts of dividend income in comparison to labour income. The dividend tax rate jumps notably at a threshold that is first 9 then 8 percent return on net assets. Moreover, there is a monetary threshold for dividends exempted from majority of the capital income tax. These discontinuities create strong incentives and have changed several times during the past decade\(^1\). Using administrative data, I study the effects of five different dividend tax schedule discontinuities on place in 2006–2016.

In the first part of the paper, I study the number of dividend payments at the thresholds using the bunching method, developed by Saez (2010). The idea of the method is that discontinuities in the tax schedule create convex kink points to the budget set of the owner. If the owners respond to a tax rate discontinuity, there should exist bunching at the kink. Indeed, that is what I observe: I find exceptionally clear dividend responses to the dividend tax rate thresholds. The excess mass at each threshold is from 6 to 20 times more than the estimated counter-factual mass. Then, I use the excess mass at the threshold to estimate an elasticity of taxable (dividend) income. I find elasticities ranging from 0.5 at the monetary thresholds to 3.6 at the net asset thresholds. This implies that a 1 percent increase in the net of tax rate reduces the taxable income by 0.5-3.6 percent, which is a massive response. However, the elasticity parameter obtained with bunching method does not compare to structural costs of taxation as it captures tax planning and other channels affecting the dividend pay-out\(^2\). Taxable income in other income bases may increase as a response to dividend tax increase, thereby the effect for total income would be smaller. Nevertheless, the elasticity of taxable income is a useful tool to capture all the responses created by the threshold and it allows for comparing the results to earlier literature on business owners’ responsiveness to taxation.

The bunching responses reported in this paper are massive compared to earlier bunching literature studying business owners responsiveness to income taxes. Kreiner

---

\(^1\) For example, the marginal tax rate on dividends (including corporate taxes) jumped from 28% to 40.5% at 90,000 euros in 2006–2011.

\(^2\) Kleven (2016) provides a good introduction to bunching and on how frictions and tax planning limit the using the bunching elasticity as a structural parameter to estimate effects of policies.
et al. (2014) and Kreiner et al. (2016) use bunching evidence to study year-end income-shifting in Denmark. They find that especially high income individuals, such as managers shift income around the year end, when the tax rates are to change the next year. However, the observed elasticity (in Kreiner et al. (2016)) estimated with the bunching method is only 0.1 and entirely driven by year end income shifters. Bastani and Selin (2014) study kinks in the Swedish income tax schedule and find no bunching, not even a hump for wage earners, whereas self-employed bunch clearly. However, comparing to bunching in the Finnish dividend tax schedule, the excess mass is small with elasticity estimates are around 0.02 for broader groups of self-employed individuals and around 0.07 for the ”purely self-employed” who only earn income from the firm they own. Chetty et al. (2011) study bunching in Danish income tax schedule. They find that frictions affect the labour supply elasticities of wage earners. Combining theory to empirical evidence, they show, that long run elasticities are likely to differ from short run elasticities, such as the ones obtained with bunching. They, too, find that business owners bunch more strongly, the estimated (short run) elasticities are 0.01 for wage earners and 0.1-0.2 for self-employed.

In the second part of the paper, I examine the mechanisms driving the bunching at the thresholds. I study the real economic effects, using the changes in the dividend tax thresholds. Moving the dividend tax threshold brings new firms to range of the higher marginal tax rate, but I find no statistically significant responses in investment or output. While finding no real effects, I show that majority of the bunching response is driven by tax-planning. I find that firm owners engage actively in inter-temporal income-smoothing and income-shifting across income bases. Inter-temporal income-smoothing means that firm owners avoid the higher marginal tax rates by retaining earnings to the firm. Such manner has several tax benefits. In addition to avoiding the higher tax bracket, the retained earnings increase the firms net assets and thereby allow for higher amount of dividend to be distributed in the lower capital income tax bracket. Also, some forms capital income are taxed more lightly when received by a firm, thereby saving through a firm may be attractive. Income-shifting across income-bases means adjusting income suitably between wage and dividend to minimize the total tax burden, this is also evident in Finnish context.

There is some existing empirical literature on how firms respond to dividend taxation. Chetty and Saez (2005) study the US dividend tax cut of 2003 and show that

---

3However, these results cannot rule out global effects affecting the whole distribution of the firms, as I study these responses locally.
dividend payments responded massively to the tax cut. Yagan (2015) carries on the research by showing that despite the notable effect in dividend payments, there was no increase in investment. Alstadsæter et al. (2015) find dividend taxes distorting the investment behaviour of cash constrained firms. Harju and Matikka (2016) show that business owners actively shift income between tax bases, namely wage and dividends, and Le Maire and Schjerning (2013) shed light on the business owners ability to use retained and withdrawn earnings to adjust their taxation. Considering this income smoothing, Le Maire and Schjerning (2013) extend the bunching method to extract the real elasticity from the massive bunching responses of business owners on business income tax thresholds.

This paper contributes to several areas of public finance literature. First, it contributes to the bunching literature studying local effects around tax rate thresholds. I show massive responses to the thresholds studied and I provide detailed information on the mechanisms driving the bunching. Second, this paper contributes to literature on investment effects of dividend taxation, by showing, that a dividend tax alteration is a weak tool for incentivizing real economic activity and investment. Such reforms seem to have mainly distributional effects. Therefore, the results support the so called new view in the literature stating that dividend taxation has little effect on investment⁴. Third, this paper extends the literature on income-shifting of firm owners by showing how actively Finnish business owners shift income both in time and across income bases to avoid locating above a marginal tax rate threshold. Fourth, I show that Finnish business income tax system creates complex incentives, such as storing savings in the firm. This implies that big differences between corporate and owner-level taxes may cause locking effects.

The rest of the paper is organized as follows. In section 2, I describe the institution and the data. Section 3 presents the payment responses to dividend taxation using the bunching method. Section 4 discusses what the payment responses imply, covering real responses, income-smoothing and income-shifting. Section 5 concludes.
Table 1: Dividend tax thresholds

<table>
<thead>
<tr>
<th>Years</th>
<th>Kink threshold</th>
<th>Net asset threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006–2011</td>
<td>90,000 €</td>
<td>9 %</td>
</tr>
<tr>
<td>2012–2013</td>
<td>60,000 €</td>
<td>9 %</td>
</tr>
<tr>
<td>2014–2016</td>
<td>150,000 €</td>
<td>8 %</td>
</tr>
</tbody>
</table>

Table 2: Owner level tax burden around the tax thresholds

<table>
<thead>
<tr>
<th>Years</th>
<th>Effective marginal tax rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below net asset threshold</td>
<td>Above net asset threshold</td>
</tr>
<tr>
<td>2006–2011</td>
<td>26%</td>
</tr>
<tr>
<td>2012–2013</td>
<td>Below 24.5%</td>
</tr>
<tr>
<td>2014–2016</td>
<td>kink 26–26.8%</td>
</tr>
<tr>
<td>2006–2011</td>
<td>Above 40.5%</td>
</tr>
<tr>
<td>2012–2013</td>
<td>kink 40.36%</td>
</tr>
<tr>
<td>2014–2016</td>
<td>40.4–43.12%</td>
</tr>
</tbody>
</table>

The earned income tax rate varies depending on the taxpayer’s income and municipality. Both the municipal and government tax schedules change nearly every year. The lowest government tax rate has been zero during the whole period and, with deductions in the municipal tax for low income earners, also the aggregate earned income tax rate has been close to zero in the low end of the income distribution. The highest overall marginal earned income tax rate has been circa 55 %. Overall government tax rates on earned income have been decreasing during the research period of 2000-2013, especially for low and middle income earners. However, the municipal income tax has been increasing; in 2000, the average rate was 17.7 %, but in 2013 it was 19.4 %. The municipal income tax varies across municipalities; in 2015 it ranged from 16.5 % to 22.5 %.

2 Institutions and Data

2.1 Institutions

There are two income tax schedules in Finland. Personal capital income, such as capital gains and rental income, are taxed at a nearly flat capital tax rate. Other income, such as wage and social benefits, is taxed with a progressive earned income tax rate schedule. The ~30 % capital income tax is lower than the highest marginal tax rates on earned income, ~50 %, aiming to boost capital mobility and to respond

---

4New view dividend tax literature dates back to King (1974) and Auerbach (1979).
to international tax competition. Owners of privately held firms\textsuperscript{5} can quite freely choose whether to receive their income as wage, dividends or leave income in the firm as retained earnings.

To prevent extensive income shifting, the dividend tax rate for privately held corporations depends on the level of net assets of the firm: only the amount of distributed dividends below a predetermined rate of return on the firm’s net assets, 8\% since 2014, are taxed with the lower capital income tax rate. Moreover, below the net asset threshold part of the capital income tax is imputed in order to mitigate the double taxation of distributed profits, since, the overall tax burden of distributed dividends includes both the flat corporate tax rate (20\% from 2014 onward) and personal dividend taxes. The dividend payments above the net asset threshold are taxed with the progressive earned income tax rate. However, the tax is applied only to 75 \% of the exceeding dividends, to reduce the double taxation. Earned income taxation in Finland includes a progressive government tax, a flat municipal income tax and pension and social security contributions. The earned income share of the dividends is added to other earned income of the owner when setting the final tax rate.\textsuperscript{6}

This complex system creates a considerable tax minimization challenge for the owner, as shown in tables 1 and 2. There has been three monetary thresholds, at 90,000, 60,000 and 150,000 euros and two net asset thresholds, 9\% and 8\%, during 2006-2016. The first column in table 2 features the marginal tax rates below and above the monetary kink, for dividends below the net asset threshold. For example, from 2006 to 2011 the effective tax rate below the monetary threshold was 26 \% as capital tax was fully exempted and above the 90,000-euro-kink the effective tax rate rate was 40.5 \%.\textsuperscript{7} The marginal tax rate above the net asset threshold in the second column

\begin{itemize}
\item \textsuperscript{5}The Finnish dividend tax system varies depending on the organizational form of the company. In this study, I focus on privately held corporations that are limited companies owned by a single person or a group of individuals. Privately held corporation is the most common corporate form in Finland covering nearly half of all firms.
\item \textsuperscript{6}In estimating elasticities and comparing taxes between wage and dividend, I calculate the marginal tax rate for one extra euro of the particular income type. I exclude the payroll tax (Employer’s social contributions: työnantajan sairausvakuutusmaksu, työeläkevakuutusmaksu, työttömyysvakuutusmaksu, ryhmähenkivakuutusmaksu. Employee’s social contributions: työeläkevakuutusmaksu, työttömyysvakuutusmaksu, vakuutetun sairausvakuutusmaksu.), since for majority of the business owners, the payroll contribution is not defined by wage sum, but is based on so called entrepreneurs labour income, that is largely decided by the owner. Thus, marginal payroll tax is generally not affected by an additional euro to gross income.
\item \textsuperscript{7}0.26+(1-0.26)*0.7*0.3. Above the monetary threshold the capital tax rate is applied to 85 \% of the exceeding dividend since 2014 and before 2014 to 70 \%.
\end{itemize}

6
depends on the owners other personal income, as dividends above this threshold face the progressive earned income tax schedule, with highest rates around 50%. Figure 1 visualizes the thresholds in marginal tax rates. For an individual firm owner, the whole region is not available, but the firm’s net assets define a restriction, that slices the three dimensional dividend tax schedule. For example a firm with exactly 1 million euros of net assets, could locate exactly at the corner of the lowest plane. By receiving more dividends, the owner would face the earned income schedule, that is the high uneven plane in the graph. The earned income tax rates above the threshold are calculated as averages of the individual tax rates of owners at the threshold.

Figure 1: Marginal tax rate for dividends 2006–2011

Note: This graph describes the thresholds in 2006-2011, when the kink was at 90,000 euros and net asset threshold at 9 percent. Above the net asset threshold, the owner pays earned income tax for 70 % of the income (85% since 2014) in addition to the corporate tax. The tax rate above the net asset threshold is estimated as a mean of the actual marginal earned income tax rates in each 5000-euro-dividend bin.

The described thresholds in the tax schedule and amendments to them create variation that enables studying the effects of dividend taxes. I study bunching caused by both the monetary and the net asset threshold, to provide evidence of the dividend tax elasticities in Finland. Then, I use the reforms to study what are the mechanisms driving the bunching effects.
Table 3: Summary statistics of the data 2006-2016

<table>
<thead>
<tr>
<th></th>
<th>mean</th>
<th>sd</th>
<th>p50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turnover</td>
<td>1074027</td>
<td>8470518</td>
<td>210747.3</td>
</tr>
<tr>
<td>Profit</td>
<td>99677.94</td>
<td>4566064</td>
<td>15124.67</td>
</tr>
<tr>
<td>Net Assets</td>
<td>639841.4</td>
<td>8057264</td>
<td>119399</td>
</tr>
<tr>
<td>Investment</td>
<td>54562.4</td>
<td>672584.5</td>
<td>1772.71</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>mean</th>
<th>sd</th>
<th>p50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dividends</td>
<td>25567.52</td>
<td>138317.7</td>
<td>8500</td>
</tr>
<tr>
<td>Wage</td>
<td>22930.7</td>
<td>28290.37</td>
<td>15660</td>
</tr>
<tr>
<td>Observations</td>
<td>641558</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 2: Dividend payment distributions during the three tax schedules (nominal)

Note: This figure plots the distribution of dividend payments to the main owners during three dividend tax schedules. The vertical line shows the fractions of firms in each 1000-euro dividend bin. In addition to round number bunching during each schedule, there is a clear spike at the prevailing monetary threshold.

2.2 Data

I use firm and owner level tax filing data that cover all Finnish privately held corporations, it covers years 2006–2016 and three different schedules in use. The data
are obtained annually from the Finnish tax administration and VATT Institute for Economic Research maintains the database. Annual firm data are matched with owner-level data of the main owners of the company and combined into a panel dataset. The data include information such as dividends and wages paid to the owner, turnover, net assets and new investment of the firm. The detailed owner level data allow me to calculate the marginal tax rates for different forms of income. Table 3 describes key variables in the data. The data include more than 600,000 observations during the research period and 113,835 distinct firms.

Figure 2 shows the dividend payment distributions during the three studied dividend tax schedules. The figure shows clear round number bunching, revealing that the payment decisions are not random. Additionally, this round number effect indicates that there is some behavioural aspect in the dividend payout choice. However, the main interest of this paper is in the highest spikes, that are driven by the thresholds. In the following section, I describe how to use this bunching evidence to estimate the elasticity of taxable income, while taking into account the round number effects.

3 Dividend Payment Responses

3.1 Bunching method

I estimate the extent of excess mass and the according elasticity of taxable income with the bunching method, developed by Saez (2010). The elasticity of taxable income (ETI) is the ratio of a percentage change in taxable income to a percentage change in the net-of-tax income rate (one minus the tax rate). The higher the elasticity, the more strongly taxable income responds to a change in the tax rate.

Intuitively, the bunching method works as follows. The owner of a company withdraws dividend income from the firm until the marginal disutility of the payment equals the marginal utility of it. Marginal disutility can be though of as the cost of the owner’s effort or the pre-tax return to invested capital, captured by the gross dividends paid to the owner. Respectively, the marginal utility is the after-tax dividend income. There should exist bunching at the convex kink points of the budget.

---

8The owner can postpone cashing the dividends from the firm. Thus, the dividend tax is paid with the tax rate of the year when the dividend is cashed, not based on the year of distribution of dividend. Therefore, some of the owners have several dividend observations from the same company and year. As a solution, dividend observations from an owner-company pair in a single year have been aggregated.

9Kleven (2016) provides an excellent review of the method and it’s indications.
set if the owners respond to this tax rate discontinuity. The dividend tax elasticity parameter is recovered by relating the excess mass in the dividend distribution to the change in the dividend tax rate at the kink point.

To measure the excess mass, I first estimate a counter-factual distribution that describes what the dividend distribution would approximately be in the absence of the kink point. The counter-factual distribution is estimated using a seventh-order polynomial excluding observations near the kink.

**Counter-factual distribution around monetary kink**

The counter-factual distribution around the monetary kink is estimated as

\[
\hat{C}^0_j = \sum_{i=0}^{p} \beta^0_i \cdot (Z_j)^i + \rho \cdot 1 \left[ \frac{Z_j}{r} \in \mathbb{N} \right] + \varepsilon_j, \ Z_j \notin [-R; R], \tag{1}
\]

where \(\hat{C}^0_j\) is the estimate of the counter-factual distribution in each bin \(j\) with dividend income \(Z_j\). \(\beta^0_i\) are the regression estimates, and \(p\) denotes the degree of the polynomial. \(\rho\) in the second term captures a round number fixed effect, that is observed in figure 2. \([-R; R]\) is the excluded range of the distribution, which denotes the area where the kink point affects the behavior of the owners. Following earlier literature (e.g. Chetty et al. 2011), this area is selected by visual observation of the data. My results and conclusions are not very sensitive to the choice of \([-R; R]\) nor the order of the polynomial.

**Counter-factual distribution around net asset threshold**

I estimate the counter-factual distribution around the net asset threshold as

\[
\hat{C}^0_j = \sum_{i=0}^{p} \beta^0_i \cdot (Z_j)^i + \frac{\sum_{j=-R}^{R} C_j}{2A + 1} + \varepsilon_j, \ Z_j \notin [-R; R], \ j \in [-A; A]. \tag{2}
\]

Bunching at the net asset threshold is so strong that I use the second term to spread the bunchers to the surrounding region to make the sum of firms in the counter-factual distribution to match that of the realized distribution. Thus, \(2A + 1\) is the number of bins in the region \([-A; A]\) of the distribution studied.
Excess mass and elasticity estimate

The sum of the excess observations in the bunching range is

\[ \sum_{j=-R}^{R} \hat{B}_j = \sum_{j=-R}^{R} \left( C_j - \hat{C}_j^0 \right). \]  

(3)

The estimate of excess bunching \( \hat{b} \) is then the estimated excess mass around the kink relative to the average density of the counter-factual dividend distribution between \(-R\) and \(R\)

\[ \hat{b} = \frac{\sum_{j=-R}^{R} \hat{B}_j}{\sum_{j=-R}^{R} \hat{C}_j^0 / (2R + 1)}. \]  

(4)

Finally, the excess bunching can be turned into an elasticity estimate. The elasticities at the kink points are estimated as

\[ \varepsilon_D = \frac{dD}{d(1 - \tau)} \frac{1 - \tau}{D} = \frac{\hat{b}}{D^* \cdot \log \left( \frac{(1 - \tau_D)}{(1 - \tau_D - \Delta \tau_D)} \right)}. \]  

(5)

\(D\) denotes dividend income, \(\tau\) the dividend income tax rate that jumps at a kink point \(D^*\) from \(\tau_D\) to \(\tau_D + \Delta \tau_D\). When estimating the elasticities at the net asset thresholds, I specify the marginal tax rate above the threshold for each firm owner individually. Then, I use the aggregate bunching response to estimate the elasticity for each owner and report the mean elasticity.

To construct standard errors, I use a bootstrap method where I sample the residuals from regression a large number of times (300), with replacement, and estimate an elasticity for each draw. Using these elasticities, I calculate a standard error for the original elasticity estimate.

3.2 Bunching evidence

Figure 3 provides the results estimated with the tax schedule in place in 2006–2011. The horizontal axis is the dividend amount relative to the €90,000 kink. The frequency of firms in each 1000-euro-bin is shown on the vertical axis. The solid line in the figure is the actual observed dividend distribution in the region. The dashed line is the estimated counter-factual distribution, which takes into account bunching at round numbers and excludes the area near the kink. The vertical lines around the kink show the bunching range \([-R; R]\) that is used to estimate the excess mass and
Figure 3: Bunching at 90k 2006–2011

Excess mass: 8.34 (1.203), Elasticity: .425 (.061)

Note: This figure plots the actual distribution of observations, represented by the solid line, and the counter-factual distribution, represented by the dashed line, in 1000-euro-bins around the 90,000-euro-threshold in 2006–2011. The vertical solid lines show the bunching region. The estimated excess mass and the corresponding elasticity are reported above the figure together with the standard errors.

Figure 4: Bunching at 60k 2012–2013

Excess mass: 6.703 (.993), Elasticity: .474 (.07)

Note: This figure plots the actual distribution of observations, represented by the solid line, and the counter-factual distribution, represented by the dashed line, in 1000-euro-bins around the 60,000-euro-threshold in 2012–2013. The vertical solid lines show the bunching region. The estimated excess mass and the corresponding elasticity are reported above the figure together with the standard errors.
Figure 5: Bunching at 150k 2014–2016

Note: This figure plots the actual distribution of observations, represented by the solid line, and the counter-factual distribution, represented by the dashed line, in 1000-euro-bins around the 150,000-euro-threshold in 2014–2016. The vertical solid lines show the bunching region. The estimated excess mass and the corresponding elasticity are reported above the figure together with the standard errors.

Figure 6: Bunching at 9% 2006–2013

Note: This figure plots the bunching mass around 9% net asset threshold. The elasticities are first estimated for each buncher individually based on their respective tax rates around the kink using the aggregate excess mass. The final elasticity reported above the graph is a mean of all the individual elasticities.
This figure plots the bunching mass around 8 % net asset threshold. The elasticities are first estimated for each buncher individually based on their respective tax rates around the kink using the aggregate excess mass. The final elasticity reported above the graph is a mean of all the individual elasticities. The capital income tax rate below and above are chosen using only dividend income, that is, the higher capital income tax bracket is only used when taxable dividends below net asset threshold exceed the monetary limit (e.g., 2015–2016: 30,000e).

elasticy. As theory predicts, a substantial excess mass takes place at the tax kink, the excess mass is more than eight times the counter-factual and the corresponding elasticity is 0.43. Bunching at the later monetary thresholds is as large. Figures 4 and 5 represent the bunching results for the monetary discontinuities at 60,000 euros in 2012–2013 and at 150,000 euros in 2014–2016. The elasticities are 0.47 and 0.54 correspondingly.

Figures 6 and 7 show the bunching results at the net asset threshold. The horizontal axis is now the dividend amount relative to firm’s net assets. The elasticity estimate reported is the mean elasticity of individual elasticities estimated using personal tax rates and the excess mass. Even though the excess mass at the threshold does not differ massively in comparison to the monetary kinks, the elasticity is clearly larger. The high elasticity is likely to represent the additional incentives for inter-temporal income shifting created by the threshold. Even though the owner cannot affect the marginal tax rates around the threshold, it can affect the position of the threshold in euros. That is, retaining earnings increases the net assets of the firm, thereby, allowing for larger amount of dividends to be distributed in the future with
a lower tax rate. I will discuss this more in sub-section 4.2. In addition to the inter-
temporal income-shifting, the owner can engage in income shifting between wage and 
dividends or other tax planning or evasion. Income-shifting is covered in sub-section 4.3. Considering both these channels captured in the bunching response, the elasticity estimates reported in the figures should not be used as structural elasticity estimates that capture the real economic effects.

4 Mechanisms

4.1 Real effects

Table 4: Summary statistics of the restricted sample (year 2011)

<table>
<thead>
<tr>
<th></th>
<th>Treated</th>
<th></th>
<th>Control</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mean</td>
<td>sd</td>
<td>p50</td>
<td>mean</td>
</tr>
<tr>
<td>Turnover</td>
<td>1541055</td>
<td>255663</td>
<td>802944.5</td>
<td>1897639</td>
</tr>
<tr>
<td>Net Assets</td>
<td>846457.5</td>
<td>99281.63</td>
<td>842540.5</td>
<td>829472.9</td>
</tr>
<tr>
<td>Dividends (main owner)</td>
<td>80094.25</td>
<td>50810.17</td>
<td>71601.25</td>
<td>45592.34</td>
</tr>
<tr>
<td>Investment</td>
<td>76105.05</td>
<td>22195.7</td>
<td>9774.46</td>
<td>80362.66</td>
</tr>
<tr>
<td>Labor costs</td>
<td>329180.9</td>
<td>471996.3</td>
<td>471996.3</td>
<td>511846.9</td>
</tr>
<tr>
<td>Variable costs</td>
<td>1130710</td>
<td>2181940</td>
<td>430710.5</td>
<td>1242189</td>
</tr>
<tr>
<td>Employees</td>
<td>10.69045</td>
<td>27.58783</td>
<td>4</td>
<td>14.84195</td>
</tr>
<tr>
<td>Observations (2011)</td>
<td>1038 (651*)</td>
<td>1394</td>
<td>8478</td>
<td>10059</td>
</tr>
</tbody>
</table>

* 651 is the number of firms paying dividend in the affected region

Dividend taxes reduce the return on invested capital and owner’s own work effort, hence decreasing incentives for new investments and exertion. An ongoing debate in the dividend tax literature, is how strongly dividend taxation distorts investment. The so called old view of theoretical literature starting from Feldstein (1970) and Poterba and Summers (1985) states that dividend taxation causes significant real responses through the cost of corporate investment, since marginal investment is funded with new equity. In contrast, the new view suggests that corporate investments are mainly financed by retained earnings or debt therefore, there is no significant effect on corporate investment (Auerbach 1979 and King 1974).

Could this kind of real economic effects claimed by the old view be driving some of the bunching responses? This is difficult to examine directly, however, I can use
the amendments in the dividend taxation to see how those facing a higher or lower marginal dividend tax rate responded to the tax changes. Dividend payouts are an endogenous choice, therefore, I cannot use the thresholds, as such, to study the real effects. To overcome the issue, I utilize the following instrumental variable difference-in-differences set-up to study the effects of dividend tax reforms on real outcomes, namely investment and output.

As the dividend tax rate depends on the net assets of the firm, main owners of same-sized firms face the dividend tax increase only depending on the owner’s share of the net assets. Therefore, I use a sub-sample of the panel data based on the net assets of the firm, and as an instrument, I use the net asset share of the main owner. The intuition is that moving the dividend tax threshold brings new firms to range of the higher marginal tax rate. If the marginal tax rate distorts investment, there should be some response in the real outcomes of these new firms.

In 2012, the monetary threshold for a higher marginal dividend tax rate was reduced from 90,000 euros to 60,000. I restrict the data to firms with net assets between 666,666.67–1,000,000€ in 2011, just before the reform. Hence, the data are a balanced panel based on the 2011 net asset position. Main owners of firms of this size face the dividend tax increase only if the owner’s share of the net assets is high enough. Thus, first stage treated are the firms with owners, whose ownership share of the firm’s net assets exceeds 666,666.67€, which implies that the maximum capital income dividend is between 60,000–90,000 euros. Thus, they faced a marginal dividend tax increase of 14.36 percentage points. The control group is the group of firms with main owner’s net assets share below 666,666.67€. For them the maximum capital income dividend was already below 60,000 euros. Thus, for them the marginal tax rate of capital income dividends decreased by 1.5 percentage points.

Net asset position, that makes a firm able to pay dividend in the lowest tax bracket, does not imply that the firm pays the maximum capital income dividend for the owner. Yet, more than 60% of the first stage treated firms do pay dividends between 60,000–90,000€, making this a suitable instrument (table 4).

Table 4 describes the data. I have approximately 1000 yearly observations in both groups, and in terms of turnover, net assets (by definition), investment and variable costs both groups are quite similar. The labour costs and number of employees differ between the groups, which is to some extent expected, as the number of owners

---

10Same size in terms of net assets.
Table 5: DiD-results to 2012 reform

<table>
<thead>
<tr>
<th></th>
<th>Turnover (log)</th>
<th>Variable costs (log)</th>
<th>Investment (log)</th>
<th>Investment per lagged capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\alpha_2(Treat \times Post)$</td>
<td>-0.015</td>
<td>0.003</td>
<td>-0.100</td>
<td>-0.101</td>
</tr>
<tr>
<td>Firm fixed effects</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Year fixed effects</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Constant</td>
<td>13.828***</td>
<td>12.733***</td>
<td>6.807***</td>
<td>0.656***</td>
</tr>
<tr>
<td>r2</td>
<td>0.020</td>
<td>0.025</td>
<td>0.109</td>
<td>0.164</td>
</tr>
<tr>
<td>N</td>
<td>16857</td>
<td>15367</td>
<td>18537</td>
<td>13376</td>
</tr>
</tbody>
</table>

* p < 0.05, ** p < 0.01, *** p < 0.001

The results confirm the visual evidence, that there is no statistically significant response to the reform. All estimated parameters for $\alpha_2$ reported on the first line of the table were close to zero and statistically insignificant. As the reduced form estimates are not statistically significant, neither are the IV estimates (not reported).

I perform the same analysis for the reform of 2014. The reform reduced the dividend tax for firm owners paying 60,000–150,000 euros of dividends and under the

11For firms of this size, it is common that the owner also works in the firm.
Figure 8: Outcomes in treatment and control group relative to year 2011

Note: Real values used, inflation from Statistics Finland. **Treatment group:** Firm’s net assets 666,666.667–1,000,000€ in 2011 and main owner’s share of net assets > 666,666.667. **Control group:** Firm’s net assets 666,666.667–1,000,000€ in 2011 and main owner’s share of net assets < 666,666.667.

asset threshold. In addition, the corporate tax rate was reduced. As the corporate tax cut affected all firms, I can use firms of same size, but smaller ownership share of the main owner as a control group. The net asset limit for the firm sample is from 750,000 to 1,875,000. Firms, whose ownership share of the net assets was 750,000 or more, act as treated firms and those whose ownership share was under 750,000 as control. Summary statistic and number of observations are reported in table 7 in the appendix. Figure 19 in the appendix shows the event study for the reform and table 8 reports the difference-in-differences results. Again, there is no statistically significant response to the reduction in the dividend tax.

The results suggest that the main mechanisms to respond to dividend tax adjustments are through other channels than investment effects. However, the set-up only studies local effects of changes in the current marginal tax rate. Therefore, I cannot rule out global effects caused by changes in average tax rates or indirect effects e.g.
through future tax burden. In any case, such responses are not driving the excess mass at the marginal tax rate thresholds. Thus, in the next section, I discuss the other channels causing the bunching responses, namely income shifting in time and across income bases.

4.2 Intertemporal income-smoothing and net asset accumulation

Figure 9: Persistence at 9 % in 2006-2013 – 1-percent-bins around the threshold

Note: The graph plots the share of same firms locating in the same 1-percent-bins around the 9-percent-threshold for 1–4 years after.

Figures 9 and 16 plot the persistence rates at the 9-percent and at the 90,000-euro thresholds respectively. The figures show that the extensive bunching is created by the same owners year after year. The proportion of firms bunching that located in the same euro- or net asset bin also 1-4 years earlier is exceptionally large compared to surrounding bins. At the 9-percent net asset threshold the rate of firms bunching for fourth year is approximately 30 percent and at the 90,000-euro kink the rate is above 20 percent. As the threshold relocates, a large share of the previous bunchers follow the threshold, the share of movers is described in table 6.
 Owners of privately held corporations do not need to adjust their profit to bunch at the tax threshold, but they can adjust owner level taxable income using retained and withdrawn earnings to shift income across years. By smoothing income with retained earnings, tax filers can hold their marginal tax rates constant. Hence, there is likely to be bunching even if taxes have no effect on real outcomes (Le Maire and Schjerning, 2013). The incentives for inter-temporal income shifting cause bunching mass to accumulate also from below as the owners have incentives to spread the payments in advance.

Retaining wealth has three advantages. First, as mentioned, using retained and withdrawn earnings allows the owner to avoid higher marginal tax rates. Second, savings and return on savings face a lower tax when received by a firm than at the owner level.\textsuperscript{12} Thus, if the owner, in any case, wishes to save some share of the

\textsuperscript{12}E.g. dividends received by a firm a primarily tax free.
income, then tax-wise it may be desirable to keep those funds incorporated. Third, by retaining earnings, the owner increases the net assets of the firm, thereby allowing for higher amounts of capital income dividends (lower tax bracket) to be distributed in the future. Then again, there are also arguments against leaving wealth to firm, namely risk controlling.

The elasticity estimates at the monetary thresholds are lower than the estimates at the net asset threshold. So the incentives for firm owners to bunch seem to be higher at this threshold. There are two potential explanations for this. First, of the previously mentioned reasons to leave wealth on the firm, the last one, increasing firm’s net assets, may be more powerful at the net asset threshold. Second, the earned income tax schedule is a lot more complex than the capital income tax schedule, so the marginal tax rate above the net asset threshold may be less clear for the owner.

Figure 10 shows the firm’s turnover, net assets, fixed capital (property and machinery) and financial assets on average across the dividend distribution of the main owners (in 5000-euro-bins). The upper left panel shows the average turnover in each dividend bin. The higher is the dividend, the higher the turnover. This does not hold in the second panel, which shows the average net assets in each bin. When the monetary threshold was at 90,000 euros, firms, whose owners bunch at the dividend threshold, have more net assets on average than firms in the surrounding dividend bins. However, there is no similar bunching in reported machinery and property, whereas it does appear in financial assets. Moreover, when the threshold moves to 60,000 euros in 2012, the net asset and financial asset bunching moves along with the threshold. This gives evidence, that firm owners bunching at the thresholds indeed retain earnings in the firm and may even use the firm to store savings (as financial assets). As additional evidence, figure 15 in the appendix shows that firms in the financial industry bunch at the threshold more actively than other industries.

Figure 11 shows that privately held corporations in Finland have accumulated wealth to the firm. To be sure that this descriptive evidence is not just driven by the increasing number of firms or economic growth, I relate this information to aggregate turnover. Even in relation to turnover there is still a substantial growth in the assets of the firms. However, this does not show as higher net investment or dividend payouts\(^\text{13}\).

\(^{13}\text{More in figure 17 in the appendix.}\)
Note: The area plots in this depict the aggregate net assets and financial assets of all firms in the data. In addition, the lines plot them both in relation to aggregate sales. The trends show, that despite the economic turbulence in past decades, the assets of the firms has been steadily increasing since the adoption of the current dividend tax schedule in 2005.

### 4.3 Income-shifting between tax bases

Income-shifting between wage and dividends allows firm owners to minimize their income tax burden. Figure 12 shows the owner’s total income from the firm in 50 income quantiles and how the income splits between wage and dividends on average in each bin. The horizontal axis describes the average dividends in each income quantile, and the vertical axis the average wage earned by the owner within a particular income quantile. The gray isoquant lines indicate the total income level so that for example 44th quantile received approximately 70,000 euros from the firm.

Income affected by the reform, that is income above 60,000 euros, clearly shifts towards more wage in comparison to dividends. The position of the quantiles in relation to the isoquant lines reveals that despite the tax increase, the inflation adjusted income stays the same in the affected quantiles. It is just the division to wage and dividend that changes. There is no similar patter when there is no reform, as shown in figure 18 in the appendix.
This figure plots the income shifting between wage and dividends as a response to the reform on 2012, which increased the taxation for dividends higher than 60,000 euros. For the figure, the main owners’ wage and dividends from the firm have been counted together as total income. Then, the owners have been divided to 50 income quantiles. Finally, for each quantile an average wage and dividends are calculated. The horizontal line shows the average dividends and the vertical line the average wage in each bin. The isoquant lines show the total income from the firm. The figure shows that as a response to the reform the owners started paying more wage and cut down dividends.

5 Conclusion

I find strong bunching in all five dividend tax discontinuities on place since 2005 in Finland. The observed bunching gives large elasticity estimates, however, I show that this is not driven by real responses e.g. in investment or effort. On the contrary, the evidence suggests that a large share of the bunching evidence captures income shifting in time and across income bases.

Owners engage in inter-temporal income-shifting by adjusting their income using retained earnings. Retaining earnings enables firm owners to avoid the higher tax brackets and it is further stimulated by the possibility to accumulate net assets to the firm. Leaving wealth to the firm has also some tax benefits, mainly on return to savings. Thus, firm owners accumulate net assets in the firm in order to optimize
return on savings and future tax burden of dividends. Moreover, I find clear income shifting between wage and dividends. Both studied reforms were followed by an adjustment in the income composition of the owner, and similar adjustment between wage and dividends was not observed when there was no reform.

This paper adds to many branches of tax literature as well as provides implications for policy planning. The results contribute to bunching literature by showing that bunching in a single income base captures a lot more than just structural elasticity (real responses). As a contribution to the dividend tax literature studying the investment effects of dividend taxes, my results give support to the new view that the marginal dividend tax rate is not the key parameter to affect marginal investment. In other words, the dividend tax adjustments provide a weak tool for incentivizing real economic activity. However, the results do not rule out the effects that larger differences in average dividend tax rates might have on investment, as this paper focuses only on marginal tax rates. The extensive income shifting responses underline, that static estimates on tax revenue effects of reforms are likely to go wrong when concerning business income. This is because business owners can adjust their income by shifting income and by retaining earnings. Finally, big differences between corporate and dividend taxes are likely to cause locking effects, as savings may be left to firm to accumulate and reduce tax burden of both dividends and return savings. Thus, the results highlight that large differences between income bases are likely to create behavioural responses causing at least distributional effects. Essentially, smaller tax differences between wage and dividends, but also between taxes paid by firms and individuals affect these distributional distortions.
References


Appendix

Additional information of the method

Figure 13: Net dividends relative to corporate income 2006-2011 and hypothetical indifference curves

Figure 13 describes the bunching method graphically. The solid line is the relation between corporate profit (gross dividend) needed to finance a certain amount of net dividend. At €90,000, the marginal tax rate increases. Consider that the tax payers maximize their utility relative to the budget set. Assume that the black curve is a hypothetical indifference curve of an individual, who decides to raise dividend exactly €90,000 despite the kink in the budget set. The dashed black line is the budget set in the absence of the kink. The dashed gray curve is the optimal dividend of another individual in that setting. After the introduction of the kink, this dashed gray individual, who earlier located at around €100,000, moves to a lower indifference curve (solid gray) and locates at €90,000 together with the black individual. As the owner with the black curve does not move anywhere, there are now more individuals than in the case of a linear budget set. I use this bunching induced by the kink to estimate the elasticity of taxable income.

Additional information of the institution

Figure 14 plots the average threshold created by the net asset threshold. The earned income tax rate above the threshold varies depending on the taxpayer’s income and
municipality. Both the municipal and government tax schedules change nearly every year. The lowest government tax rate has been zero during the whole period and, with deductions in the municipal tax for low income earners, also the aggregate earned income tax rate has been close to zero in the low end of the income distribution. The highest overall marginal earned income tax rate has been circa 55%. The government tax rates on earned income have been decreasing during the research period of 2006-2016 especially for low and middle income earners. However, the municipal income tax has been increasing; in 2000, the average rate was 17.7%, but in 2015 it was 19.9%. The municipal income tax varies across municipalities; in 2015 it ranged from 16.5% to 22.5%.

Figure 14: Average marginal tax rate for firms paying dividends under the monetary dividend tax threshold

Note: The tax rate above the threshold is estimated as a mean of the marginal earned income tax rates in the data. The earned income tax rate varies depending on the taxpayer’s income and municipality. Both the municipal and government tax schedules change nearly every year. The lowest government tax rate has been zero during the whole period and, with deductions in the municipal tax for low income earners, also the aggregate earned income tax rate has been close to zero in the low end of the income distribution. The highest overall marginal earned income tax rate has been circa 55%. Overall government tax rates on earned income have been decreasing during the research period of 2000-2013, especially for low and middle income earners. However, the municipal income tax has been increasing; in 2000, the average rate was 17.7%, but in 2013 it was 19.4%. The municipal income tax varies across municipalities; in 2015 it ranged from 16.5% to 22.5%.
Figure 15: Industry shares among of 90k bunchers 2006-2011

Note: The figure plots the shares of each industry in bins around the 90,000-euro threshold. According to the figure, the financial sector is over-represented at the kink.

Additional information of the bunching responses

Figure 15 shows that finance industry is overrepresented among the firms bunching at the monetary threshold. Figure 16 shows the persistence of firms in the 90,000-euro threshold and table 6 show how large share of firms moves together with the threshold. Figure 18 shows the income composition in two consecutive years when there was no reform. The figure acts as a robustness check, that the shift observed in figure 12 was driven by the tax change. Figure 17 shows that even if there is increase in the accumulated assets of the privately held corporations, there is no increase in aggregate investment.

Additional results of the real responses

Table 7 describes the data I use to study the effects of the second reform in 2014. The reform reduced the tax rate for dividends between 60,000–150,000 euros for owners with net asset share between 750,000–1,875,000 euros. Figure 19 plot the
Table 6: Percentage share of firm owners relocating together with the kink

<table>
<thead>
<tr>
<th>Reform</th>
<th>Year</th>
<th>Movers as a share of bunchers before reform</th>
<th>Movers as a share of bunchers after reform</th>
</tr>
</thead>
<tbody>
<tr>
<td>90k → 60k</td>
<td>2011/2012</td>
<td>46.72%</td>
<td>24.52%</td>
</tr>
<tr>
<td>60k → 150k</td>
<td>2013/2014</td>
<td>8.12%</td>
<td>35.45%</td>
</tr>
<tr>
<td>9pr → 8pr</td>
<td>2013/2014</td>
<td>60.33%</td>
<td>70.40%</td>
</tr>
</tbody>
</table>

Figure 16: Persistence at 90,000 euros in 2006-2011 – In 1000-euro-bins

event studies for turnover, variable costs and investment, there is no statistically significant response to the tax cut. The diff-in-diff results in table 8 confirm the result of no effect. These results are the first stage of the instrumental variable set-up, but if there is no effect in the first stage, there is no effect for the second stage either.
Figure 17: Aggregate net asset accumulation, profits and retained earnings

Figure 18: Income-shifting between wage and dividends

Note: This graph describes income-shifting between wage and dividends before the reform of 2012.
Table 7: Summary statistics of the restricted sample (year 2013)

<table>
<thead>
<tr>
<th></th>
<th>Treated</th>
<th></th>
<th>Control</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mean</td>
<td>sd</td>
<td>p50</td>
<td>mean</td>
</tr>
<tr>
<td>Turnover</td>
<td>2307248</td>
<td>1.51e+07</td>
<td>967603.8</td>
<td>2444987</td>
</tr>
<tr>
<td>Net Assets</td>
<td>1226032</td>
<td>325761.6</td>
<td>1170015</td>
<td>1089996</td>
</tr>
<tr>
<td>Dividends (main owner)</td>
<td>85368.86</td>
<td>108177.2</td>
<td>69000</td>
<td>50472.34</td>
</tr>
<tr>
<td>Investment</td>
<td>101979.3</td>
<td>279940.9</td>
<td>16909.12</td>
<td>92262.13</td>
</tr>
<tr>
<td>Labor costs</td>
<td>451738.7</td>
<td>621883.8</td>
<td>240626.4</td>
<td>650701.4</td>
</tr>
<tr>
<td>Variable costs</td>
<td>1872973</td>
<td>1.67e+07</td>
<td>586906.2</td>
<td>1655490</td>
</tr>
<tr>
<td>Employees</td>
<td>13.20741</td>
<td>27.33048</td>
<td>4</td>
<td>16.53348</td>
</tr>
</tbody>
</table>

| Observations (2013)      | 2027 (1568*)|            | 2240       |            |
| Observations (total)     | 10437       |            | 10619      |            |

* 1568 is the number of firms paying dividend in the affected region

Note: These are the descriptive statistics of the firms used in the diff-in-diff set-up of figure 19.

Figure 19: Outcomes in treatment and control group relative to year 2013

Note: Real values used, inflation from Statistics Finland. **Treatment group:** Firm’s net assets 750,000–1,875,000€ in 2013 and main owner’s share of net assets > 750,000. **Control group:** Firm’s net assets 750,000–1,875,000€ in 2011 and main owner’s share of net assets < 750,000.
<table>
<thead>
<tr>
<th></th>
<th>Turnover (log)</th>
<th>Variable costs (log)</th>
<th>Investment (log)</th>
<th>Investment per lagged capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\alpha_2(Treat \times Post)$</td>
<td>-0.030</td>
<td>-0.013</td>
<td>-0.031</td>
<td>0.295</td>
</tr>
<tr>
<td></td>
<td>0.026</td>
<td>0.032</td>
<td>0.146</td>
<td>0.247</td>
</tr>
<tr>
<td>Firm fixed effects</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Year fixed effects</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Constant</td>
<td>13.986***</td>
<td>13.043***</td>
<td>6.003***</td>
<td>0.541***</td>
</tr>
<tr>
<td>r2</td>
<td>0.010</td>
<td>0.013</td>
<td>0.069</td>
<td>0.097</td>
</tr>
<tr>
<td>N</td>
<td>18294.000</td>
<td>16787.000</td>
<td>21056.000</td>
<td>17293.000</td>
</tr>
</tbody>
</table>

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$