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ANTICIPATING
TAX CHANGES:
EVIDENCE FROM
THE FINNISH
CORPORATE
INCOME TAX
REFORM OF 2005

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Abstract: Using register-based panel data covering all Finnish firms in 1999–2004, we examine how corporations anticipated the 2005 dividend tax increase via changes in their dividend and investment policies. The Finnish capital and corporate income tax reform of 2005 creates a useful opportunity to measure this behaviour, since it involves exogenous variation in the tax treatment of different types of firms. The estimation results reveal that those firms that anticipated a dividend tax hike increased their dividend payouts by 20–50 per cent. This increase was not accompanied by a reduction in investment activities, but rather was associated with increased indebtedness in non-listed firms. The results also suggest that the timing of dividend distributions probably offset much of the potential for increased dividend tax revenue following the reform.

Key words: Corporate income taxation, dividends, tax reform, anticipation effects

JEL Classification: H25, H32

Tiivistelmä: Tutkimuksessa tarkastellaan muutoksia yritysten osinko- ja investointipäätöksissä vuoden 2005 pääoma- ja yritysverouudistusta edeltävinä vuosina. Suomalaisten yritysten reagointia esityksiin osinkoverotuksen uudistamisesta selvitetään hyödyntämällä rekisteripohjaista yrityspaneelia, joka kattaa kaikki suomalaiset osakeyhtiöt. Vuoden 2005 pääoma- ja yritysverouudistus tarjoaa hyödyllisen tilaisuuden analysoida ennakoimiskäyttäytymisen suuruutta, koska kyseiseen verouudistukseen liittyy eksogeenista vaihtelua veromuutoksen suuruudessa yritysten välillä. Estimointitulosten mukaan yritykset, jotka ennakoivat osinkoverotuksensa kiristyvän, lisäsivät osingonjakoaan 20–50 prosentilla vuosina 2003 ja 2004. Osinkojen kasvuun ei kuitenkaan yhdisty investointiaktiivisuuden lasku; sen sijaan listaamattomilla yrityksillä on nähtävissä velkaantuneisuuden lisääntymistä. Lisäksi tulosten mukaan osingonjaon ajoituksen suunnittelu tasoittaa huomattavasti uudistuksella tavoiteltavaa osinkoverotulojen kasvua.

Asiasanat: Yritysverotus, osingot, verouudistus, ennakointivaikutukset

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1. Introduction

While the theoretical analysis of the impacts of taxing corporate income on dividend and investment behaviour is well developed, there is still considerable uncertainty about the empirical magnitudes of these effects. Recent studies nonetheless have successfully utilised policy reforms to isolate the causal impacts of tax changes. Such evidence is available, in particular, for the Anglo-Saxon countries (see, for instance, Bond et al. (2007) for UK evidence and Chetty and Saez (2005) and Auerbach and Hassett (2007) for the US).

This paper makes use of the Finnish corporate and capital income tax reform of 2005 to examine the impacts of dividend tax changes on dividend distributions and investments. Finland has had a dual income tax system in operation since 1993. The reform of 2005 was the first major tax reform regarding corporate income since the implementation of the dual income tax. In that reform, Finland reduced the corporate income tax rate, abandoned the imputation credit system that had been in place since 1990 and moved back towards partial double taxation of dividends. By reducing corporate income tax, the government aimed to enhance the international competitiveness of the Finnish corporate income tax system and to boost domestic investments. One of the reasons for increasing the taxation of dividends was, in turn, to mitigate the loss of tax revenues. It also became evident that the imputation credit system, favouring domestic owners, would have been against EU legislation.

The reform increased the taxation of dividends from domestic firms listed on the stock exchange, but it also slightly reduced the tax burden of foreign owners. In closely held corporations, dividends up to a certain threshold level were kept tax-free. The 2005 reform therefore increased the dividend taxation of some, but not all enterprises, and the tax treatment was based on determinants (such as ownership structure) that were to a large extent exogenous to the firm at the time of the reform. All this suggests that the reform involved sufficient exogenous variation in tax treatment, and it therefore opens up a promising avenue for reliable empirical work. The reform can also be used to shed light on effects of dividend taxation under the dual income tax. This can serve as a guide to proper design of institutional details of the dual tax system, something that may be useful outside the Nordic countries as well.

In more detail, we examine how firms – both listed and non-listed corporations with domicile in Finland – changed their dividend and tax policy in anticipation of the 2005 tax reform in 2003–2004. We examine the changes in dividend distributions and real investment. We use register-based panel data, covering all Finnish firms from the period 1999 to 2004, and the differences-in-differences method. Treatment and control groups are constructed on the basis of how the tax

proposals affected firms of different size (in terms of dividend distributions), ownership and stock market status.

The reasons why we focus on the announcement effects are twofold. First, it is of interest per se to learn to what extent firms minimise their tax burden over time. This behaviour is likely to be especially pronounced within corporate and capital income taxation, since the timing of investment decisions and dividend distributions can be altered more easily than, for example, individuals' labour supply. Given that tax reforms are often aimed at enhancing the efficiency of the tax system, tax planning through timing of financial transactions can seriously reduce tax revenues and therefore eat up a large chunk of the potential efficiency gains. Second, since firm managers are forward looking, anticipation effects most likely reveal information on the long-term effects of tax changes as well.

How should we expect dividend taxation to affect firm's decisions? Recently Auerbach and Hasset (2007) and Gordon and Dietz (2006) surveyed the still unsettled theoretical literature on the subject. The so called 'old view' of dividend taxation assumes that dividends are sticky and the marginal source of financing of investment is new share issues. It implies that a tax change affects both investments and dividends. The 'new view' instead, argues that dividend tax capitalizes into the share values and is neutral with respect to investment and dividend decisions. This view relies on the assumption that marginal source of financing is profits, thus dividends are determined as a residual item after investments. The latter result needs some qualification however. As implicated by Auerbach and Hasset (2007) a temporary dividend tax change induces a timing effect to dividends and investments, hence affects firm behaviour also under the 'new view' model. This case was discussed during the US 2003 tax reform debate,¹ but the idea should be applicable also when a tax change is announced long before its actual implementation; the Finnish 2005 tax reform could be a case in point. Also, under non-linear dividend tax schemes, the firm's cost of capital may be dependent of dividend taxation even under the 'new view' assumptions. Lindhe et al. (2004) and Hietala and Kari (2006) analyse such features of the Finnish dividend tax system.

Our paper also relates to the extensive empirical work on the determinants of dividend distributions, as surveyed e.g. by Allen and Michaely (2002). A large number of papers examine the impacts of tax reforms on firms' policies, in particular the tax reforms passed in the US in 1986 and 2003. In the Tax Reform Act of 1986 (TRA) the tax rates on ordinary income and capital gains were set at the same level. There was still a tax disadvantage with dividends because capital gains were only taxed on realization. Several studies argue that the TRA affected firms and that firms adjusted dividend payout ratios subsequent to the passage of

¹ The US dividend tax cut was legislated to expire at the end of 2008.

the TRA.² In mid-2003 the tax rates on both dividends and capital gains were reduced for individual investors, thereby simplifying and greatly reducing the level of equity taxation (The Jobs and Growth Tax Relief Reconciliation Act of 2003). As explained above, theory suggests that such a tax cut should lead to greater dividend payouts because it reduces the tax disadvantage of dividends relative to capital gains. Chetty and Saez (2005) establish a causal link between the tax cut and increased dividend activity. They argue that the tax cut led to increased dividend initiations. They also report that dividend increases are positively related to share ownership by managers.³

We proceed as follows. Section 2 presents the key ingredients of the two proposals for the Finnish 2005 tax reform and derives theoretical hypotheses of how different firms would react to the reform. Section 3 describes the dataset and our empirical approach. The estimation results regarding whether dividend distributions of firms in different tax categories reacted in different ways are presented in Section 4. Section 5 examines how dividend changes were reflected in investment policies and debt decisions. Section 6 concludes.

² Examples of studies of the US 1986 tax reform include Ben-Horim, Hochman and Palmon (1987), Bolster and Janjigian (1991) and Casey, Anderson, Mesak and Dickens (1999).

³ Examples of other studies of the US tax reform of 2003 include Brown, Liang and Weisbenner (2004), Blouin, Raedy and Shackelford (2004), Nam, Wang and Zhang (2004). Bond et al. (2005) examine the effects of the 1997 UK dividend tax reform.

2. Theoretical predictions based on the 2005 tax reform

2.1 The reform

Dividend taxation before the 2005 reform

Since the previous major tax reform of 1993, Finnish income taxation has followed the lines of the Nordic dual income tax (DIT). All types of personal capital income such as dividends, capital gains and rental income have been assessed at a low flat-rate tax and all other income (wages, salaries, pensions and social security benefits etc.) have been classified as earned income and taxed according to a progressive tax rate schedule.⁴ Prior to the 2005 tax reform the tax rate on capital income and corporate profits was 29 per cent⁵, while the top marginal tax rate (MTR) on earned income was around 55 per cent. The 2005 reform did not alter the main outlines of this system, but brought important changes to company-level taxation as well as to the taxation of dividends and capital gains.

Before the 2005 reform, Finland applied a full imputation system to relieve the double taxation of distributed profits. The system led to a zero effective tax rate on dividends at the shareholder level, due to equal tax rates on corporate profits and capital income. Dividends from non-listed corporations received special treatment, however. These dividends were split into capital income and earned income to curb income-shifting caused by the wide tax rate gap between these income types. The portion of dividends taxable as capital income was calculated as a 9,585 per cent return on the firm's net assets. The residual part was taxed as earned income. This dividend split concerned all domestic corporations not quoted on the main list of the Helsinki Stock Exchange (HSE).

The 2002 Arvela report

In October 2002 a tax reform panel appointed by the Ministry of Finance and chaired by Mr. Lasse Arvela handed down its report on reforming the Finnish capital income taxation (Arvela Report 2002). Among its main proposals were reductions in capital income and corporate tax rates from 29 to 25 per cent and a move from the imputation system to full double taxation of dividends. The splitting of non-listed dividends would also have been abolished. The proposal would have meant a substantial increase in the taxation of dividends taxable as

⁴ The total tax liability on earned income consists of several parts. Church tax, local income tax and sickness insurance contributions are paid at flat rates, while the central government income tax is progressive. There is an additional social security contribution paid by wage earners on wage income.

⁵ The flat capital income tax rate was 25 per cent in 1993–1995 and 28 per cent in 1996–1999.

capital income from 29 per cent to 43.5 per cent. For those dividends, then taxed as earned income, the proposal would have caused a potential reduction in the tax burden.

The 2005 reform

The panel's tax reform model did not meet with the support of the Finnish government, which came up with its own blueprint in November 2003. The final bill passed by parliament in June 2004 and implemented as from 2005 closely followed the 2003 blueprint, especially in terms of dividend taxation.

Table 2.1 Dividend taxation before and after the 2005 reform

	Previous tax system	The Arvela proposal (announced 2002)	The 2005 reform (announced 2003)
Tax rate on corporate profits	29	25	26
Personal tax rate on capital income	29	25	28
Top MTR on earned income ⁶	55	55	55
Method of dividend taxation	full imputation	double taxation	partial relief
- taxable share of dividends	..	100	70
Splitting parameter (effective)	9.585	-	9
ETR (nominal) on capital gains	12	13	14
Combined tax rate on dividends:			
Listed firms :			
HSE main list	29	43.5	40.5
HSE OTC list	29/55 ⁷	43.5	40.5
Non-listed firms			
Capital income ≤ 90 t€	29	43.5	26
> 90 t€			40.5
Earned income (Top MTR)	55	55	54.5

The government bill included the following features (Table 2.1). The corporate tax rate was cut to 26 and the capital income tax rate to 28 per cent. Instead of full double taxation of dividends the government chose a system of partial relief under which 70 per cent of dividends were included in the recipient's taxable

⁶ Top MTR of 2004. Observe that neither the Arvela report nor the Government proposal included cuts in the MTR on earned income. Some smaller cuts were eventually implemented, however.

⁷ In the tax system, prior to the 2005 reform, dividends from companies quoted on the OTC list were split into capital income and earned income.

capital income. The splitting system was maintained. A major exception from the main lines of the new dividend tax system was that the capital income part of dividends from non-listed corporations was made tax-exempt up to a fixed amount of 90,000 euros. Any amount beyond that was taxed according to the main rule. The 70 per cent rule was also applied to the earned income part of the dividend.⁸

2.2 Theoretical predictions

An unconventional element of the Finnish dividend tax system is the splitting of dividends from non-listed companies into capital income and earned income parts. Lindhe et al. (2004) and Hietala and Kari (2006) show that the dividend split affects investment incentives and may well reduce the cost of capital to a very low level. This concerns especially firms whose owners have a high marginal tax rate on earned income. Kari and Karikallio (2007) discuss the implications of the splitting system for dividend distributions. They show that, under that system, a non-listed corporation's optimal pay-out policy may well be to distribute exactly the maximum amount of dividends taxable as capital income. This policy rule combined with investment of the remainder of after-tax profits in financial assets is argued to be a value-maximizing way to avoid high taxes on earned income. Thus the pay-out policy of these firms is considerably affected by the tax rules. Using the same data set as in the present paper, the study provides empirical support for the theoretical predictions, especially concerning dividend distributions.

To establish a causal role of the tax increase, we exploit the fact that the 2005 dividend tax changes only affected dividend income distributed to individuals. There was, however, considerable variation in the tax changes also within this dividend category (see sec. 2.1). The prime example of these is dividends from non-listed corporations taxable as capital income, which remained tax exempt up to the amount of 90,000 euros. One further aspect affecting our hypotheses is that the ceiling for dividends taxable as capital income makes dividend decisions very rigid for those non-listed firms for which this ceiling is binding. Thus we do not expect to see any anticipatory response among these firms.

⁸ Further changes, although less relevant from the point of view of this study, were the exemption of capital gains from shares in corporate taxation, a slight increase in the personal taxation of capital gains and the abolition of wealth taxation (as from 2006).

In establishing our hypotheses we divide firms into 5 different groups depending on their stock market status, ownership structure and the amount of dividend distributions; that is, based on factors that are relevant for the expected effect of the tax change.

1. Corporations quoted on the main list of the HSE, where the majority of shares are owned by foreign or domestic institutional investors
2. Corporations quoted on the main list of the HSE with a large share of domestic ownership
3. Non-listed corporations⁹ with dividends taxed as earned income at the margin¹⁰
4. Non-listed corporations with dividends taxed at the margin as capital income, maximum dividend payment below 90,000 euros
5. Non-listed corporations¹¹ with dividends taxed at the margin as capital income, maximum dividend payment above 90,000 euros

The classification of companies into groups 1 and 2 was made on the basis of whether Finnish natural persons owned over 50 per cent of the company in 2004.¹²

The information of the Arvela proposal became public in October 2002 and the information of the government proposal in November 2003. Considering that these two proposals differed very much in how they were expected to affect different groups of taxpayers, we build two different hypotheses. The first one reflects a response to the Arvela report and should be seen in dividends paid out of the 2002 profits; the other relates to the response to the 2003 government proposal and should be seen in dividend payments out of the 2003 profits.

Concerning the Arvela report, Table 2.1 suggests that in almost all cases dividend taxation of individual shareholders would have increased. The exceptions are dividends taxable at the margin as earned income by a natural person (group 3) and dividends received by a foreign investor or a Finnish institutional investor (group 1). Thus we hypothesize that the Arvela 2002 report induced an anticipating increase in dividend payments in companies in groups 2, 4 and 5. These groups are our treatment groups in 2003, measured by our Treatment03 variable.

⁹ This includes corporations quoted on the OTC list.

¹⁰ Put differently, the ceiling for dividends taxable as capital income is binding.

¹¹ This includes corporations quoted on the OTC list.

¹² We also tested to use a proportional share of ownership by domestic individuals as a continuous variable in our estimation models. However, the results did not differ significantly from the results we received by using the share of ownership as a category variable.

This variable takes value 1 for firms in the treatment groups and 0 otherwise, for all other years and all other groups.

Again as seen from Table 2.1, the 2003 government proposal raised the level of dividend taxation for listed companies and for those non-listed companies which paid out dividends of an amount exceeding the 90,000 euro threshold. For the rest, the level of the tax burden was broadly unchanged. These latter cases include non-listed companies with dividends below the threshold and non-listed companies with dividends taxed at the margin as earned income. Hence we hypothesize that the 2003 government proposal induced an increase in dividends in firms in groups 2 and 5. These are our treatment groups in 2004, measured by our Treatment04 variable and coded 1 for firms in these groups and 0 otherwise, for all other years and all other groups.

3. Data and the empirical approach

The panel data employed contains information on the financial statements and taxation of Finnish corporations in the period 1999–2004. It was collected by the Finnish Tax Administration and is based on firms' tax declarations. The dataset also includes tax return information on the principal shareholders of all dividend-distributing corporations.

In comparison to similar studies that use smaller data sets, an important quality of the data is that there is no restriction on the size of the firm or the sector it operates in. It covers all Finnish firms that are subject to taxation and thus small firms make up the vast majority of the data. Table 3.1 below presents some descriptive statistics of the key variables we have used in our estimations. We have classified firms into listed and non-listed firms. We have also divided firms into treatment and control groups according to the final reform proposal. On average, listed firms that were affected by the tax reform were smaller than firms in the control group, whereas non-listed treated firms were bigger than the control firms. However, as will be seen below, the trends in their dividend distributions before announcing the reforms were very similar.

In Figures 3.1 and 3.2 we compare the pattern of median dividends between the treatment and control groups in the period of 1999–2004. Until 2003 the changes in median dividends have been quite similar in both groups. The most interesting observation is a considerable increase in treatment group dividends compared to control group dividends in 2003 and 2004: both listed and non-listed corporations anticipated the 2005 dividend tax increase via changes in their dividend policies.

Table 3.1 Descriptive statistics 1999–2004

Listed corporations	Obs	Mean	Std. Dev.	Min	Max
Treatment group					
Dividend / Assets	209	0,03	0,05	0,00	0,38
Profit / Assets	283	0,06	0,10	-0,55	0,65
Investment / Assets	272	0,05	0,11	<0,001	1,32
Equity / Debt	271	2,08	7,80	0,011	23,62
Growth rate	201	0,08	1,16	-0,31	0,97
Ln(Employment)	292	5,61	1,24	1,10	8,88
Debt / Assets	236	0,20	0,16	<0,001	0,98
Control group					
Dividend / Assets	314	0,08	0,14	0,00	1,57
Profit / Assets	327	0,09	0,13	-0,24	0,82
Investment / Assets	427	0,06	0,22	<0,001	5,65
Equity / Debt	397	1,21	9,18	0,001	37,40
Growth rate	422	0,02	1,19	-0,76	1,00
Ln(Employment)	345	6,03	1,19	0,69	10,28
Debt / Assets	392	0,20	0,16	<0,001	0,98
Non-listed corporations					
Treatment group (2004)					
Dividend / Assets	7156	0,07	0,08	0,00	0,99
Profit / Assets	7702	0,09	0,12	-0,49	0,90
Investment / Assets	7120	0,04	0,09	<0,001	1,46
Equity / Debt	7478	1,37	8,06	0,002	46,78
Growth rate	7048	-0,001	0,36	-1,95	1,00
Ln(Employment)	7449	2,86	1,19	0,69	6,95
Debt / Assets	7474	0,16	0,15	<0,001	0,99
Control group					
Dividend / Assets	154249	0,06	0,08	-0,66	1,00
Profit / Assets	214188	0,07	0,11	-0,50	0,90
Investment / Assets	141295	0,08	0,13	<0,001	1,50
Equity / Debt	201375	1,28	9,86	<0,001	49,98
Growth rate	172618	-0,004	0,38	-2,00	1,00
Ln(Employment)	161527	1,97	0,97	0,69	7,77
Debt / Assets	195717	0,22	0,17	<0,001	1,00

Figure 3.1 *Median dividend in listed corporations*

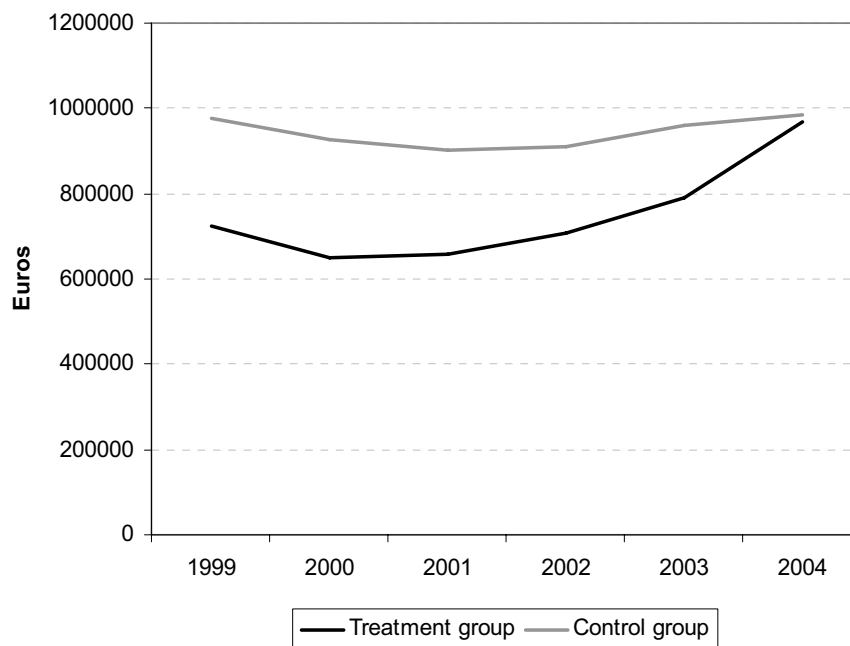
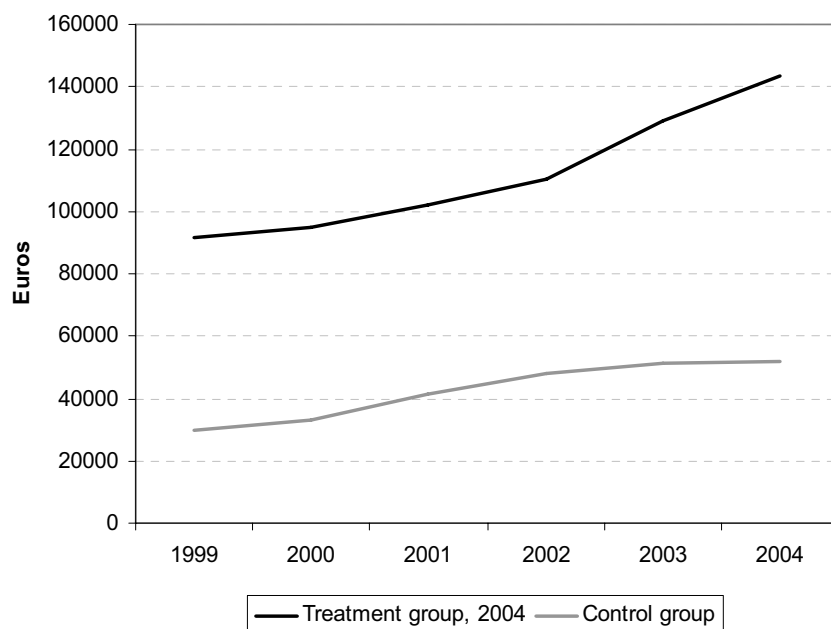


Figure 3.2 *Median dividend in non-listed corporations*



The Finnish 2005 tax reform allows us to use a simple difference-in-difference estimation strategy by providing exogenous time-series variation in tax rate changes. We therefore estimate equations of the following type

$$(1) \quad d_{i,t} = \alpha_i + \beta X_{i,t} + \delta_g + \eta_t + \text{treatment03}_{i,t} + \text{treatment04}_{i,t} + \varepsilon_{i,t},$$

In Eq. (1), $d_{i,t}$ refers to the dependent variable of firm i at time t , δ_g is a dummy variable for each group of firms¹³, η_t is a time dummy and $\varepsilon_{i,t}$ is the individual error term, assumed to be distributed independently across firms. In some specifications, we also let the constant vary by firm and that is why it also has the subscript i . The *treatment03* variable is a dummy variable which is equal to 1 if the firm expects to face an increase in dividend taxation after the tax reform and 0 otherwise according to the Arvela proposal. The *treatment04* variable refers, in turn, to the Government Proposal. The treatment variables differ across groups of firms and over time¹⁴. Finally, in some equations we include a number of other control variables, denoted by $\beta X_{i,t}$.

The identifying assumption is that other potential unobservable factors of dividend or investment behaviour affect the treatment and the control groups in the same way. Apart from the tax change, we do not see any other major reasons that would have a differential impact on firms differing in their ownership status and the dividend level over this time period. To further examine the credibility of our treatment/control group division, we estimated models where we used business profits as a dependent variable and the same set of explanatory and control variables as in our reported estimations. These model specifications did not produce significant coefficients for our treatment variables.¹⁵

¹³ We have divided firms into those 5 groups described in the previous chapter. Dividend distribution in Finland is quite rigid and largely influenced by dividend taxation. The Appendix includes the proportional shares of the firms which have switched the group and also sensitivity analysis of estimation models in different definitions of corporate group number 5.

¹⁴ We also estimated models using only one treatment variable which was combination of Treatment03 and Treatment04 variables. This treatment variable was significant in all model specifications. Noticing this, the Arvela and Government effects can be estimated together or separately.

¹⁵ These results are available from the authors upon request.

4. Estimation results for dividend distributions

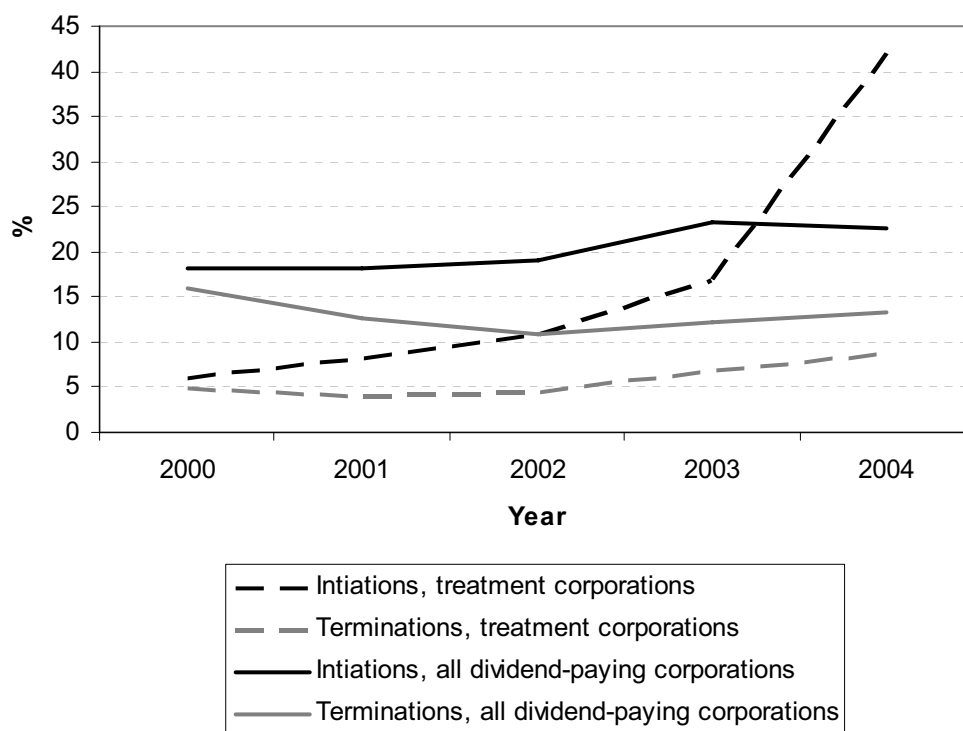
We follow Chetty and Saez (2005) and estimate both extensive and intensive responses in dividend payout policy. In our paper the extensive margin refers either to the initiation of dividend distributions by firms that had not paid dividends earlier or to a discrete change in dividend policy of non-listed firms that had earlier paid dividends below the maximum amount taxable as capital income. The idea behind the latter group is that the dividend-tax hike induced them to raise their dividends from a low level to the “tax-optimal” level corresponding to the maximum amount taxable as capital income. These extensive margin responses are estimated by logit models. The intensive margin refers, in turn, to the actual amount of distributed dividends. For investment and debt equations, we only measure intensive margins.

4.1 Extensive models

We first investigate dividend initiations during the planning period of the tax reform in non-listed firms.¹⁶ If the anticipated tax increase affects dividend payments, we expect to see an increase in initiations prior to the reform. In Figure 4.1 we plot the proportion of dividend initiations and the proportion of dividend terminations both in the group of dividend-paying corporations and in the treatment group. The initiations have increased especially in the treatment group during 2003 and 2004.

¹⁶ Almost all listed firms have always distributed some dividends and therefore measuring new dividend distributions is not of much importance.

Figure 4.1 *Dividend initiations and terminations*



Next, we examine this hypothesis by estimating a logit model, where the dependent variable is an initiation dummy taking the value 1 if the firm initiates dividend distribution and 0 otherwise.

Our basic specification with group and time dummies is given in column (1) of Table 4.1. In the other models, we investigate the robustness of these results. The panel logit model, with a firm-specific dummy variable, is given in column (2). While this model may not be the preferred specification because of the so-called incidental-parameters problem leading to inconsistent estimates (Hsiao 2003, Ch. 7), it can still serve as a robustness check for other models without firm dummies. The rest of the specifications drop the firm dummy and include the following control variables: a) a profit-to-assets ratio; b) 2-digit industry dummies; c) location dummies and d) the logarithm of the number of employees. In every specification we have reported coefficients of the estimated models and marginal effects ($\partial y/\partial x$) which show directly the magnitude of the anticipated tax increase to the probability of dividend initiation.

Table 4.1 *Initiation of dividend distributions in non-listed corporations*

	(1)		(2)		(3)		(4)		(5)	
	Initiation	$\partial y/\partial x$	Initiation	$\partial y/\partial x$	Initiation	$\partial y/\partial x$	Initiation	$\partial y/\partial x$	Initiation	$\partial y/\partial x$
Treatment03	0.174 (7.85)**	0.042 (7.97)**	0.130 (4.23)**	0.032 (4.30)**	0.146 (6.11)**	0.036 (6.17)**	0.139 (5.77)**	0.034 (5.82)**	0.228 (7.86)**	0.057 (7.85)**
Treatment04	0.628 (7.29)**	0.140 (8.19)**	0.905 (7.85)**	0.222 (8.01)**	0.655 (6.79)**	0.151 (7.52)**	0.664 (6.84)**	0.153 (7.60)**	1.007 (6.80)**	0.240 (7.69)**
Profit/assets					2.013 (44.63)**	0.497 (44.57)**	1.998 (43.98)**	0.494 (43.92)**	3.036 (48.72)**	0.754 (48.73)**
ln(employment)									1.235 (160.25)**	0.306 (165.89)**
DUMMIES										
Group	yes		yes		yes		yes		yes	
Firm			yes							
Year	yes		yes		yes		yes		yes	
Industry					yes		yes		yes	
Location							yes		yes	
Constant	-0.873 (9.53)**				-0.792 (7.57)**		-1.147 (10.82)**		-2.640 (16.84)**	
Obs	256780		256780		230698		230698		199695	
Pseudo R ²	0.03				0.06		0.07		0.26	

Robust z statistics in parentheses
* significant at 5%; ** significant at 1%

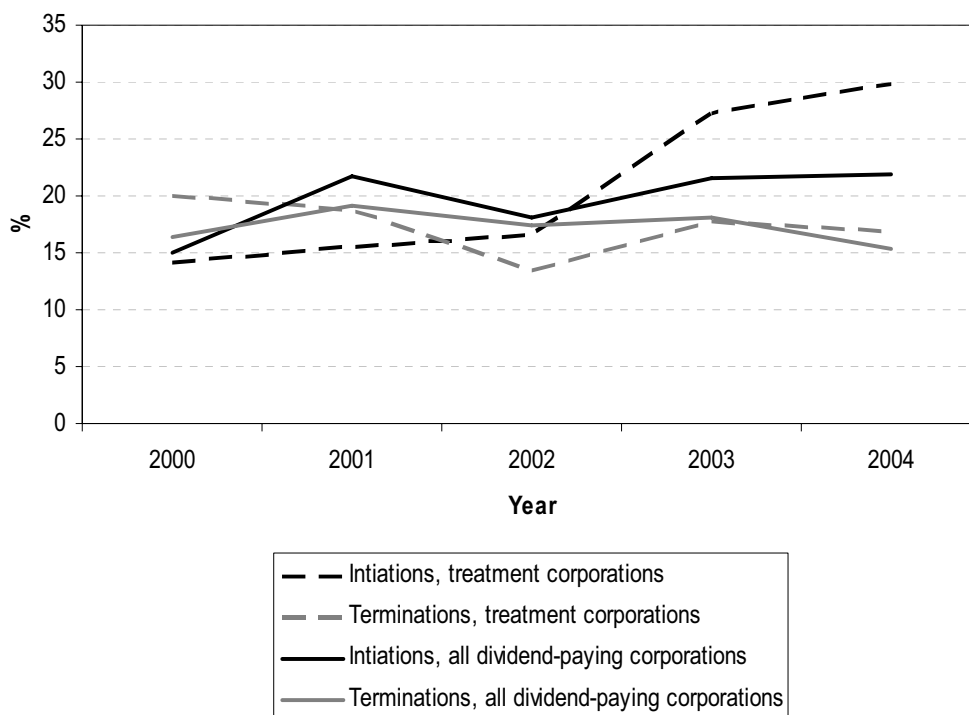
The results across specifications suggest that the number of firms distributing dividends increased as a response to both the Arvela tax plan in 2003 and the actual tax proposal in 2004. As expected, the magnitude of the impact of the actual plan is much higher than that of the preliminary Arvela report. The Arvela report increased the probability that a firm distributes dividends by 3–6 per cent depending on specification, whereas the corresponding increase resulting from the government plan was 15–24 per cent. These results represent sizeable responses to the tax proposals.

As well as initiating dividends payouts, firms were also able to exploit the tax advantages of the old system more efficiently before the introduction of the new tax system. As discussed above, the tax system seems to have created incentives for non-listed companies to distribute as dividends the maximum amount taxable as capital income. Kari and Karikallio (2007) present evidence that a significant proportion of dividend-distributing non-listed corporations closely followed this rule in their pay-out policies.

Therefore we also examine whether the expected dividend tax change increased the probability of firms distributing the maximum amount of normal dividends. In Figure 4.2 we plot the proportions of firms which have started or stopped to

distribute the maximum amount of normal dividends. We observe that the tax-optimal dividend policy has increased most significantly in the treatment group in 2003.

Figure 4.2 *Tax-planning initiations and terminations*



We also run a logit specification where the dependent variable is equal to 1 if the firm started to distribute dividends equal to the maximum amount of normal dividends and 0 otherwise. We use the same set of regressors and controls as in our earlier analyses (Table 4.2).

We find that much of the response in tax planning appeared already in 2003; it was 11–37 per cent more probable that a firm would exploit the maximum amount of tax-free dividends if it foresaw an increase in dividend taxation after the reform. The additional impact in 2004 was much milder, and in the specification with firm-level dummies it was not significant.

We conclude that, in anticipation of a possible tax increase, firms took advantage of potential loopholes in the Finnish dividend tax system in force. We observe pre-reform increases in probabilities of initiation and of tax-planning, indicating that corporations prepared themselves for a tax increase. As a reaction to the tax reform, corporations found an incentive to a) pay dividends and b) pay dividends of the maximum amount that was totally tax-free due to the imputation credit.

Table 4.2 Tax planning in non-listed corporations

	(1)		(2)		(3)		(4)		(5)	
	Initiation	$\partial y/\partial x$	Initiation	$\partial y/\partial x$	Initiation	$\partial y/\partial x$	Initiation	$\partial y/\partial x$	Initiation	$\partial y/\partial x$
Treatment03	1.865 (36.59)**	0.256 (25.63)**	1.326 (23.47)**	0.115 (24.11)**	2.372 (50.12)**	0.348 (33.85)**	2.370 (50.12)**	0.350 (33.82)**	2.376 (50.14)**	0.370 (30.83)**
Treatment04	0.272 (2.08)*	0.024 (1.87)	0.107 (0.76)	0.012 (0.79)	0.374 (2.76)**	0.031 (2.38)*	0.371 (2.75)**	0.030 (2.35)**	0.366 (2.69)**	0.028 (2.12)*
Profit/assets					8.875 (100.67)**	0.492 (89.68)**	8.012 (100.88)**	0.488 (85.91)**	6.885 (100.97)**	0.476 (79.79)**
ln(employment)									-0.001 (0.11)	-0.001 (0.11)
DUMMIES										
Group	yes		yes		yes		yes		yes	
Firm			yes							
Year	yes		yes		yes		yes		yes	
Industry					yes		yes		yes	
Location							yes		yes	
Constant	-4.143 (99.07)**				-4.823 (87.56)**		-4.806 (84.24)**		-4.684 (72.54)**	
Obs	256780		256780		230693		230693		199690	
Pseudo R ²	0.16				0.15		0.15		0.15	

Robust z statistics in parentheses
* significant at 5%; ** significant at 1%

4.2 Intensive models

In this subsection, we examine the change in the magnitude of dividends paid out. Thus our dependent variable is now continuous. We focus on firms that distributed dividends in every year of our sample and exclude firms with zero dividends paid out during some years.

Non-Listed Corporations

Table 4.3 below reports the results of the dividend regressions for non-listed corporations. The dummy variables and other controls are the same as earlier.

Table 4.3 *Dividend responses in non-listed corporations*

	(1)	(2)	(3)	(4)	(5)
Dependent variable: Dividend/assets					
Treatment03	0.008 (10.21)**	0.009 (12.53)**	0.007 (13.16)**	0.007 (9.43)**	0.007 (8.52)**
Treatment04	0.014 (6.14)**	0.015 (6.76)**	0.009 (3.86)**	0.008 (3.86)**	0.009 (3.91)**
Profit/assets			0.234 (89.17)**	0.237 (89.14)**	0.247 (84.46)**
ln(employment)					-0.004 (34.51)**
DUMMIES					
Group	yes	yes	yes	yes	yes
Firm		yes			
Year	yes	yes	yes	yes	yes
Industry			yes	yes	yes
Location				yes	yes
Constant	0.041 (16.49)**	0.035 (14.11)**	0.032 (12.83)**	0.033 (12.85)**	0.034 (13.11)**
Obs.	153791	153791	121623	118885	100377
R-squared	0.15	0.15	0.30	0.30	0.32
Robust t statistics in parentheses * significant at 5%; ** significant at 1%					

Coefficients of the treatment variables are statistically significant in all model specifications. The results reveal that the amount of dividends increased in a significant way in firms that anticipated higher taxes in the future. This is valid both after the Arvela report and after the government proposal.

From our data, the mean of the dividends/assets variable for non-listed firms in the period 1999–2004 was 0.04168. The increase in dividends consequent to the anticipated tax increase was therefore 17–19 per cent in 2003 and 19–36 per cent in 2004.¹⁷ While it may not be surprising that firms reacted to the dividend tax hike, the magnitude of the increase is, in our view, quite considerable.

¹⁷ Calculated as follows: $0.007/0.04168 = 17\%$, where the numerator is the coefficient of the treatment variable.

Listed Corporations

The response to the dividend tax reform proposals can differ across listed and non-listed firms. The following part analyses the response by the firms listed on the stock exchange. Under the reform proposals, the greatest increase in dividend taxation was faced by listed companies with individual Finnish owners. On the other hand, listed companies owned by institutional or foreign shareholders did not face big changes in dividend taxation.

Table 4.4 summarizes the results of the estimations. The coefficients measuring the reaction in 2003 and 2004 are significant in all cases. Given that the mean of the dividends/assets ratio in the period 2003–2004 was 0.05521, the marginal impact of the Arvela report on the amount of dividends distributed was 35–50 per cent. This is greater response than in the case of non-listed companies.

Table 4.4 Dividend responses in listed corporations

	(1)	(2)	(3)	(4)	(5)
Dependent variable: Dividend/assets					
Treatment03	0.028 (4.30)**	0.029 (2.42)*	0.020 (3.21)**	0.020 (3.09)**	0.026 (3.44)**
Treatment04	0.027 (4.70)**	0.047 (4.26)**	0.023 (3.54)**	0.022 (3.35)**	0.022 (2.96)**
Profit			0.376 (3.92)**	0.375 (3.89)**	0.348 (3.93)**
ln(employment)					-0.020 (6.39)**
DUMMIES					
Group	yes	yes	yes	yes	yes
Firm		yes			
Year	yes	yes	yes	yes	yes
Industry			yes	yes	yes
Location				yes	yes
Constant	0.063 (6.44)**	0.063 (10.00)**	0.059 (1.14)	0.079 (1.33)	0.355 (4.68)**
Obs	595	595	588	585	573
R-squared	0.28	0.26	0.33	0.34	0.47
Absolute value of t statistics in parentheses * significant at 5%; ** significant at 1%					

4.3 Calculating losses in tax revenues

The value of the treatment parameters, together with the amount of dividends in the categories of firms treated enables us to give an estimate of the tax revenue losses the government suffered owing to the timing of the dividend decisions.

The idea is as follows. The treatment dummy variables tell how much the firms that anticipated a tax increase advanced their dividend payments to the period before the tax reform. As we saw, the actual magnitude of these parameters varied from specification to specification, and therefore we take the mean value of the treatment parameter values. The actual dividends paid out by the treated firms in 2003 and 2004 include these additional dividends, and taking out the magnitude equal to the marginal effect of the mean of the treatment variable gives the value of the additional dividends. Without the tax reform, these would not have been paid before the reform. Therefore it is plausible to believe that these additional dividends were then missing from the tax base after the reform.

The value of the dividends in the listed and non-listed firms in the treated categories in 2003 and 2004 was roughly a billion euros, and the overall value of additional dividends was roughly 210 million euros (See Table 4.5 below). After the tax reform, 70 % of this amount would have become taxable income at the flat capital income tax rate of 28 %. This means that the overall tax revenue loss amounts to 41 million euros. Before the reform, the government estimated that the overall increase in dividend tax receipts could be approximately 150 million euros per year. Therefore, the tax revenue loss took away 27 per cent of the increase in dividend tax revenues in the first year (if all losses were realized in that year). Whether this is a small or large revenue loss is, of course, debatable. But had the dividend tax increase been more wide-ranging than it actually was (because, in the end, only dividends exceeding 90,000 euros were taxable in non-listed companies), the euro amount of the revenue loss would have been larger as well.

Table 4.5 Estimating tax revenue losses

	Amount of dividends, t €		Mean treatment parameter,%		Increase in dividends, t €	
	2003	2004	2003	2004	2003	2004
Listed	507,479	367,383	25	28	101,496	80,365
Non-listed	80,714	78,395	18	26	12,312	16,177

5. Financing the additional dividends

Since dividends increased, the question arises of how this is reflected in the firms' other decisions. One alternative is that investments could have decreased, and this for two reasons. First, if firms are liquidity constrained, paying out some of their funds as dividends reduces their resources available for investments. Second, an increase in dividend taxation in the future may reduce the incentives for investment already earlier. This can happen if an investor foresees that an investment provides return after a few years, but the net-of-tax return of the investment is lowered because at the future period, dividends paid out from the profitable investment are already subject to heavier taxes. There are reasons to believe, however, that we should not observe a difference in investments between our treatment and control groups affected by this profitability channel. First, as explained in the introduction, according to the 'new view', dividend taxes do not affect investments of mature corporations. Second, Hietala and Kari (2006) analyse the tax rules for dividends from Finnish non-listed firms, and claim that the effects of the 2005 reform on the cost capital of non-listed corporations is very mixed and depends much on the circumstances of the owner and the firm. This would mean that the main potential effect on investments might well come through the cash flow channel.

Even if investments would not react, the balance sheet position of firms could change due to increased dividends so that, for example, indebtedness increases. In this section we will investigate the effects on both investments and indebtedness.

5.1 Investment responses

We first consider investment responses. The models are similar to those used in the dividend regressions, but we now also include two additional control variables: capital adequacy, measured by equity/debt, and the growth rate in the firm's turnover. The results, reported in Table 5.1 for listed firms and in Table 5.2 for non-listed firms, reveal that there was no significant effect in the investment behaviour of firms during the years preceding the tax reform. In all model specifications the coefficients of the treatment variables have mixed signs and come out statistically insignificant. One possible explanation is that the level of investment decisions is relatively inflexible in the short period of our analysis. Or it may imply that investments can be financed by other sources of funds and therefore the treatment of dividends is not of paramount importance (as in the 'new view' of dividend taxation).

Table 5.1 Investment responses in listed corporations

	(1)	(2)	(3)	(4)	(5)
Dependent variable: Investment/assets					
Treatment03	-0.019 (1.34)	-0.025 (1.07)	-0.009 (1.57)	-0.009 (1.55)	-0.007 (1.60)
	(1.89)	(1.71)	(0.67)	(0.63)	(0.51)
Treatment04	0.004 (0.54)	0.008 (0.54)	0.014 (1.74)	0.011 (1.08)	0.011 (1.11)
Profit			0.013 (0.28)	-0.019 (0.38)	-0.006 (0.12)
Debt			0.103 (2.31)*	0.089 (2.23)*	0.101 (2.33)*
Growth			0.024 (1.47)	0.025 (1.50)	0.030 (1.72)
ln(employment)					-0.007 (2.04)*
DUMMIES					
Group	yes	yes	yes	yes	yes
Firm		yes			
Year	yes	yes	yes	yes	yes
Industry			yes	yes	yes
Location				yes	yes
Constant	0.056 (5.79)**	0.055 (7.92)**	0.148 (7.40)**	0.198 (7.09)**	0.258 (4.78)**
Obs.	690	690	435	433	427
R-squared	0.14	0.21	0.26	0.30	0.31
Robust t statistics in parentheses * significant at 5%; ** significant at 1%					

Table 5.2 *Investment responses in non-listed corporations*

	(1)	(2)	(3)	(4)	(5)
Dependent variable: Investment/assets					
Treatment03	0.001 (0.38)	0.001 (0.64)	-0.002 (0.87)	-0.001 (0.89)	-0.001 (0.23)
Treatment04	0.005 (1.78)	0.002 (0.51)	0.005 (1.57)	0.005 (1.56)	0.005 (1.58)
Profit/assets			0.091 (12.50)**	0.091 (12.52)**	0.092 (12.22)**
Equity/debt			-0.001 (17.33)**	-0.001 (17.19)**	-0.001 (19.93)**
Growth rate			0.005 (3.65)**	0.005 (3.81)**	0.008 (6.09)**
ln(employment)					-0.007 (19.10)**
DUMMIES					
Group	yes	yes	yes	yes	yes
Firm		yes			
Year	yes	yes	yes	yes	yes
Industry			yes	yes	yes
Location				yes	yes
Constant	0.083 (21.83)**	0.080 (18.51)**	0.084 (17.39)**	0.094 (18.79)**	0.105 (20.25)**
Obs.	148415	148415	110696	110696	104625
R-squared	0.01	0.01	0.07	0.07	0.08
Robust t statistics in parentheses * significant at 5%; ** significant at 1%					

5.2 Debt financing

Let us now consider the reaction in the debt/assets ratio. One of the motivations for the earlier tax reform in 1993, when Finland moved to a Nordic dual income tax system, was to increase the attractiveness of equity finance and to reduce the vulnerability of firms to external shocks. Without considering whether these incentives actually went too far – Lindhe et al. (2004) argue that the cost of capital in the form of equity was very low in the previous tax regime in Finland – the 2005 tax reform clearly reduced the incentives for reducing leverage for some firms (Hietala and Kari 2006). The debt regressions below reveal that in non-listed firms which anticipated tax increases, the stock of debt also increased. The increased dividend distributions were therefore partially funded by an increase in

indebtedness. There was no similar effect in listed firms, which may more often have other items in their balance sheets to fund dividend distributions.

Table 5.3 Debt responses in listed corporations

	(1)	(2)	(3)	(4)	(5)
Dependent variable: Debt/assets					
Treatment03	-0.008 (0.48)	-0.007 (0.46)	-0.012 (0.70)	-0.013 (0.79)	-0.015 (0.89)
Treatment04	-0.024 (1.70)	-0.025 (1.71)	-0.019 (1.52)	-0.017 (1.34)	-0.014 (1.08)
Profit			-0.221 (2.87)**	-0.221 (2.98)**	-0.202 (2.67)**
ln(employment)					0.013 (4.41)**
DUMMIES					
Group	yes	yes	yes	yes	yes
Firm		yes			
Year	yes	yes	yes	yes	yes
Industry			yes	yes	yes
Location				yes	yes
Constant	0.178 (12.89)**	0.201 (25.61)**	0.176 (4.06)**	0.283 (5.78)**	0.067 (1.09)
Obs.	710	710	693	690	674
R-squared	0.02	0.02	0.14	0.18	0.25
Robust t statistics in parentheses * significant at 5%; ** significant at 1%					

Table 5.4 Debt responses in non-listed corporations

	(1)	(2)	(3)	(4)	(5)
Dependent variable: Debt/assets					
Treatment03	0.010 (3.52)**	0.013 (4.32)**	0.010 (3.67)**	0.010 (3.61)**	0.014 (4.48)**
Treatment04	0.001 (0.13)	0.001 (0.10)	0.004 (0.71)	0.004 (0.71)	0.004 (0.72)
Profit/assets			-0.223 (34.55)**	-0.223 (34.62)**	-0.232 (31.92)**
ln(employment)					0.019 (56.19)**
DUMMIES					
Group	yes	yes	yes	yes	yes
Firm		yes			
Year	yes	yes	yes	yes	yes
Industry			yes	yes	yes
Location				yes	yes
Constant	0.238 (33.90)**	0.224 (38.39)**	0.245 (33.40)**	0.242 (32.69)**	0.222 (29.70)**
Obs.	133191	133191	126853	125443	112074
R-squared	0.03	0.03	0.06	0.06	0.09
Robust t statistics in parentheses * significant at 5%; ** significant at 1%					

6. Discussion

This paper examines how Finnish corporations adjusted their dividend distributions and investments in anticipation of the 2005 corporate and capital income tax reform. Since the reform treated different types of corporations in different ways, it involved exogenous variations to their tax treatment, offering an opportunity for reliable empirical estimates. The results can be used to shed light on three distinct issues: the debate between the ‘old’ vs. the ‘new’ view of dividend taxation, the strength of anticipatory responses, and the design of the dual income tax. Since we have measured only reactions at a short term, the conclusions regarding the long-term effects, must however, be seen as tentative.

We find that firms which anticipated increased tax on dividend distributions increased their dividend payouts in a statistically significant way prior to the reform. This took place both at the extensive margin and at the intensive margin. However, this was not reflected in a reduction in investment activity. There is also evidence that in non-listed firms the increased dividend distributions were partially funded by increasing debt. Therefore, the tax linkage between dividends and financial structure appears to be more direct than that of investments. This behaviour can be, at least cautiously, seen as consistent with the ‘new view’ of dividend taxation, according to which the timing of dividends is adjusted, whereas investment behaviour remains untouched.

Secondly, the results imply that while companies distributed abnormally high dividends prior to the reform, they tended to pay out abnormally low dividends after the reform. This tax planning behaviour therefore probably reduced dividend tax receipts for a few years after the reform. According to our calculations, the revenue losses amounted to roughly 30 % of predicted annual dividend tax receipts. The Finnish capital income tax reform was publicly debated extensively and for quite a long time. This seems to have had both positive and negative effects. The public discussion might have corrected misguided policies in the first tax reform proposal, but it also made the tax reform vulnerable to lobbying. And during the process, firms found ample time to organize their financial structure to minimize their tax burden over time.

Finally, we find that the prospect of increased dividend taxation pushed the firms to make the most out of the tax-planning opportunities embodied in the Finnish version of the dual income tax system. In particular, firms started to distribute dividends up to the maximum level taxed at the more lenient capital income tax rate. This suggest that the tax-planning incentives of the dual income tax system must indeed be taken seriously, and these incentives, as well as incentives on capital accumulation and financial structure, need to be designed in a rigorous manner.

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Appendix: Additional information of group definition

Shares of the firms that have switched the group (%)

	2000	2001	2002	2003	2004
1. Listed corporations the majority of shares owned by foreign or domestic institutional investors	5.1	6.5	8.1	6.7	2.1
2. Listed corporations with a large share of domestic ownership	8.6	8.7	6.5	3.0	7.1
3. Non-listed corporations with dividends taxed as earned income at the margin	7.4	4.3	8.8	3.4	8.2
4. Non-listed corporations with dividends taxed at the margin as capital income, maximum dividend payment below 90,000 euros	8.9	7.4	6.8	7.3	7.9
5. Non-listed corporations with dividends taxed at the margin as capital income, maximum dividend payment above 90,000 euros	9.9	8.4	14.2	14.9	11.8

Sensitivity analysis of estimation models in different definitions of corporate group number 5

Estimated models include the total control set

Maximum dividend payment above		Initiation of Dividend Distribution				Tax Planning			
		coeff.	Robust z	$\partial y/\partial x$	Robust z	coeff.	Robust z	$\partial y/\partial x$	Robust z
70 000 €	Treatment03	0.216	(7.64)**	0.051	(7.41)**	1.654	(30.11)**	0.295	(23.48)**
	Treatment04	0.975	(6.51)**	0.229	(6.99)**	0.302	(2.53)**	0.024	(1.77)
85000€*	Treatment03	0.228	(7.86)**	0.057	(7.85)**	2.376	(50.14)**	0.370	(30.83)**
	Treatment04	1.007	(6.80)**	0.240	(7.69)**	0.366	(2.69)**	0.028	(2.12)*
100 000 €	Treatment03	0.355	(9.91)**	0.082	(10.88)**	3.115	(75.22)**	0.424	(66.01)**
	Treatment04	1.412	(8.95)**	0.291	(9.34)**	0.425	(4.14)**	0.047	(3.97)**

Maximum dividend payment above		Dividend Responses		Investment Responses		Debt Responses	
		coeff.	Robust z	coeff.	Robust z	coeff.	Robust z
70 000 €	Treatment03	0.006	(7.89)**	-0.001	(0.20)	0.012	(4.09)**
	Treatment04	0.009	(3.94)**	0.003	(1.02)	0.004	(0.65)
85000€*	Treatment03	0.007	(8.52)**	-0.001	(0.23)	0.014	(4.48)**
	Treatment04	0.009	(3.91)**	0.005	(1.58)	0.004	(0.72)
100 000 €	Treatment03	0.009	(9.47)**	0.002	(1.83)	0.017	(5.88)**
	Treatment04	0.023	(7.81)**	0.005	(1.69)	0.011	(2.56)**

* Used in the estimation results in the text

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