

Investment Incentives in Closely Held Corporations and Finland's 2005 Tax Reform *

Harri Hietala^a and Seppo Kari^b

Department of Economics, University of Helsinki
Discussion Paper No. 618:2005
ISBN 952-10-1554-3, ISSN 1459-3696

April 25, 2005

Abstract:

This paper analyses the effects of the recent Finnish income tax reform on the behaviour of a closely held corporation (CHC) and its owners. The main elements of the reform are cuts in corporate and capital income tax rates and the replacement of the current full imputation system by a partial double taxation of distributed profits. Considerable exemptions are applied to relieve the taxation of dividends from CHCs. The analysis indicates that the change in the CHCs cost of capital depends on the marginal tax rate (MTR) of the owner. In the case of a high-MTR entrepreneur, the cost of capital increases or is retained at the present level while at lower MTRs the cost of capital may well decrease. The latter observation is due to the increase in the tax rate gap between earned income and capital income. Thus the reform does not remove the earlier reported non-neutralities of the Finnish tax system. The reform will also affect the owner's choice of the form of compensation. Higher taxation of dividends will improve the position of wage income as a form of compensation. This will cushion the effect of the dividend tax changes on the CHCs cost of capital.

Key words: capital income taxation, dual income tax, tax reform

JEL Code: H24, H25, H32

* We are grateful to Diderik Lund and the participants of the Nordic Workshop on Tax Policy and Public Economics in Helsinki, 26-27 November 2004 for a useful discussion.

^a Department of Economics, University of Helsinki and HECER, P.O. Box 17, FI-00014 University of Helsinki, email: harri.hietala@helsinki.fi.

^b Government Institute for Economic Research (VATT), P.O. Box 1279, FI-00101 Helsinki, e-mail: seppo.kari@vatt.fi.

1 Introduction

In January 2005 a tax reform bill became effective in Finland and introduced important changes to the taxation of dividends and corporate profits. Since the previous major reform in 1993, Finnish income taxation has followed the lines of the Nordic dual income tax (DIT). All personal capital income and corporate profits have been taxed at a flat tax rate, in recent years 29 per cent, and all earned income (wages, social benefits etc.) has been subject to a traditional progressive tax rate schedule. A full imputation system has been applied to the taxation of distributed profits.

The recently adopted reform lowers the tax rate on corporate profits from 29 to 26 per cent and the personal capital income tax rate from 29 to 28 per cent. Perhaps the most important change, however, is the replacement of the full imputation system by a partial double taxation of distributed profits. This change has major implications for the income tax code and also individual as well as firm behaviour.

Most of the elements of the reform are attributable to the changes in the European tax environment in recent years. These developments include the ongoing decrease in corporate tax rates and the low tax rates of the new EU Member States. The European institutions have also adopted a tougher stance towards national dividend tax systems that give relief on dividends received from domestic sources only. In recent rulings and communications, the European Court of Justice and the European Commission have regarded such practices as discriminatory (European Commission 2003).

Small business taxation has received much attention in the Nordic tax policy debate in recent years. One of the focuses of this debate has been the dual income tax system. To avoid tax planning and tax avoidance, especially by entrepreneurs, induced by the wide tax rate gap between capital income and earned income, the Nordic countries adopted rules under which entrepreneurial income is divided into capital income and earned income on an estimated basis. In Finland, and in Sweden and Norway, the profits of a sole proprietor and dividends from a closely held corporation (CHC) are split into the two income types by categorizing the entrepreneur's capital income as an imputed return on the firm's assets and interpreting the residual of income as earned income.

Economic effects of these tax systems have been analysed in several studies. Hagen and Sørensen (1998) examined the potential effects of the splitting system on the entrepreneur's tax planning and investment decisions. Kari (1999) and Lindhe et al. (2002) showed formally the dependence of the firm's cost of capital on the parameters of the splitting system and on the tax rate difference between the MTR on earned income and the flat rate on capital income. They also showed that different ways of implementing the splitting system lead to diverging incentive effects. One crucial feature is how the capital base of the split is defined. In Finland the capital base corresponds to the firm's current net assets. The Finnish system tends to lead to high investment incentives for high MTR entrepreneurs (Kari 1999). Sweden defines the capital base as the acquisition cost of shares. Under this method the potential incentive effects only concern investments financed by new share issues. Under the current tax parameters, however, the effect seems to be small (Lindhe et al. 2004). While the Swedish and Finnish net asset-based splitting systems only affect equity-financed investment, the Norwegian system, with gross business assets as the capital base, may also distort investment financed by debt. Lindhe et al. (2004) argue that this effect may be considerable in Norway.

In the case of an entrepreneur, wages and dividends are easily interchangeable as forms of remuneration that the entrepreneur withdraws from the firm. The main distinguishing feature may

be taxation. Fjærli and Lund (2001) analyse forms of remuneration under DIT using Norwegian micro data. They find out that the taxation indeed motivates the type of payout from firms to owners strongly but not uniquely.¹ Lindhe et al. (2002 and 2004) stress that the owner's choice of the form of remuneration should be taken into account, when the effects of tax rules on the firm's cost of capital are analysed. The reason is that the tax treatment of the optimal marginal form of remuneration determines the personal-level tax parameters relevant for the firm's cost of capital. This income form is in fact also the source from which the firm finances its internally financed investments.

Most of the existing analysis on the implications of the Nordic dual income tax systems has been carried out in a deterministic framework. An essential feature of DIT is, however, its non-linearity, which may have important effects on behaviour in an uncertain environment. Thus, a deterministic model is perhaps not the most appropriate framework to analyse the effects of DIT. One related issue concerns the choice of the imputed rate. The question is, whether the rate should reflect an equity risk premium to grant neutrality. This issue is important since the deterministic analyses have shown the size of the special investment incentive of DIT to be sensitive to the difference between the imputed rate and the owner's rate of return requirement. (Lindhe et al. 2004.) Some studies, like Hagen and Sørensen (1998) and Sørensen (2003), advocate the view that, under certain conditions, no or only a small risk premium may be needed to produce neutrality.² This view may be interpreted to give some indirect support to the assumptions applied in deterministic studies.

Surprisingly little analysis has been carried out on the effects of the DIT and splitting methods on the career choice of potential entrepreneurs and on the entry investment and growth of small businesses. Kari (1999) and Lindhe et al. (2002) touch on the issue of incentives for initial investment. Using the nucleus model by Sinn (1991), they argue that the splitting system raises the investment threshold for a start-up investment compared to a tax system with a flat capital income tax rate and no income-splitting into capital and earned income. Kannianen et al. (2004) derive an opposing result in a different framework and suggest that the splitting system lowers the cost of capital during a test investment period of a start-up firm.

This paper analyses the effects of the recent Finnish tax reform on tax planning and investment incentives in CHCs using a deterministic framework. The focus is on how the introduction of the new dividend tax system with different types of reliefs affects the owner's choices between dividends and wages as forms of remuneration, and, given these choices, how the incentives to invest are changed. A simple static indifference condition approach is used to derive the firm's cost of capital. The analysis centres on how the new dividend tax rules interact with the special incentive effects of the splitting system.

The rest of the paper proceeds as follows. The next section provides an overview of the pre- and post-reform tax treatment of a CHC's profits in Finland. Section 3 analyses the owner's choices between wages and dividends. Section 4 derives the cost of capital formulae for a CHC in different cases and discusses the channels through which the reform affects them. In the same section numerical calculations are also presented. Section 5 concludes.

¹ Entitlement to social security benefits may be another.

² There is a larger literature on the investment neutrality of another tax system also based on imputed income, the so called ACE-tax system. See Fane (1987), Bond and Devereux (1995), Panteghini (2001), Sørensen (2003) and Bond and Devereux (2003).

2 Pre- and post-reform tax treatment of CHCs in Finland

In this chapter we first describe the central features of the pre-reform tax system with the emphasis on the taxation of entrepreneurial income. Then we summarise the elements of the reform. A summary of the changes is presented in Table 1. Finally we explain how social security contributions are determined for entrepreneurs.

Pre-reform tax system

Since 1993 Finnish income taxation has been based on the Nordic DIT model. The net amount after allowable expenses of all types of capital income such as dividends, capital gains and rental income is taxed as one unified income type at a flat tax rate, which since January 2000 has been 29 per cent.³ All other income (wages, salaries, pensions and social security benefits etc.) is classified as earned income and the net amount after deductions is taxed according to a progressive income tax schedule. 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 national income tax is progressive. The total top MTR on earned income is around 54.92 per cent (in 2004). Thus, the tax rate difference between the top MTR and the proportional rate on capital income is considerable, close to 26 percentage points. Below the threshold of national income tax (11 700 euros), income earners pay only flat-rate taxes at an average rate of 20.92 per cent (2004). There is an additional social security contribution paid by wage earners on wage income.

Since 1990 Finland has applied the full imputation system to relieve the double taxation of distributed profits. Since the 1993 tax reform, the system has led to a zero effective tax rate on dividends (taxed as capital income) at the shareholder level, due to equal tax rates on corporate profits and capital income. Capital gains are taxed as ordinary capital income at a rate of 29 per cent. The base is the selling price minus the acquisition cost and other costs without any indexation. The so-called presumed acquisition cost may however reduce the effective level of taxation in some cases. This arrangement means that, as an alternative to realised costs, the taxpayer may deduct a so-called presumed acquisition cost, which is 50 per cent of the selling price for long-term gains (>10 years).

Personal net wealth is taxed in Finland at a rate of 0.9 per cent. The tax base is fairly narrow. Most types of interest-bearing assets are excluded from it and only 70 per cent of the value of corporate shares in quoted firms is calculated into the owner's taxable gross wealth. Similarly, the assets of a closely held firm are assessed at only 30 per cent of their current value for taxation purposes.

Entrepreneurial income from small businesses is divided into capital income and earned income. This income split concerns the profits of sole proprietors and partnerships as well as dividend income received from CHCs. The capital base used to calculate the imputed return (capital income part) is the net assets invested by the owner and includes both the original capital input and the retained profits of the firm. In the case of a CHC, the portion of dividends taxable as capital income is calculated as a 13.5 per cent return on the firm's net assets. In Finland, unlike Norway and Sweden, the split concerns not only CHCs but all other domestic corporations not quoted on the main list of the Helsinki Stock Exchange. Similarly, the split is applied not only to dividends received by the so-called active owners, as in Sweden and Norway, but to all individuals receiving dividends from the non-quoted firm (Lindhe et al. 2003 and 2004).

³ The uniform tax rate on corporate profits and personal capital income was 25 per cent in 1993–95 and 28 per cent in 1996–99. Interest income is subject to a final withholding tax, the tax rate being the capital income tax rate.

The Finnish reform

The Finnish corporate and capital income tax reform, which was voted by Parliament in June 2004 and became effective as from January 2005, contains the following changes:

- The corporate tax rate and capital income tax rate are lowered from 29 per cent to 26 and 28 per cent, respectively.
- The full imputation system is abandoned. As a rule, 70 per cent of personal dividend income is counted as taxable capital income. Dividends from non-quoted corporations, however, are tax-exempt up to 90,000 euros. Any amount exceeding this threshold is taxed according to the main rule.
- The splitting of dividends into capital and earned income portions is retained. The scope of the splitting system is slightly narrowed. The split concerns corporations not listed on any exchange list, including the OTC list. The rate of the imputed return is lowered to 9 per cent.
- Of the total of dividends exceeding the imputed return on net assets (maximum amount of capital income), again 70 per cent is taxed as the recipient's earned income.
- The net wealth tax rate is lowered from 0.9 to 0.8 per cent and the threshold is raised from 185,000 to 250,000 euros.⁴ There is a further source of relief which links capital income tax and wealth tax. Capital income tax paid on dividends exceeding the 90,000 euro threshold can be deducted from the net wealth tax.
- Other elements are the exemption in corporate taxation of capital gains received from sales of shares in other corporations. Further, the rate at which the presumed acquisition cost of long-term capital gains is calculated is lowered from 50 to 40 per cent. The outcome is that the effective tax rate on long-term gains rises despite the reduction in the legal tax rate.

Tax Parameter		Pre-reform Regime	Post-reform Regime
Statutory Tax Rate on Corporate Income	τ_f	29	26
Personal Tax Rate on Capital Income	τ_c	29	28
Rate of Imputation	u	29	0 (partial relief)
Personal Tax Rate on Capital Gains	τ_g	29	28
Personal Tax Rate on Net Wealth	τ_{nw}	0.9	0.8
Personal Tax Rate on Earned Income ⁵	τ_e	54.92	54.92
Presumptive Rate of Capital Income ⁶	b	9.585	9
Valuation of Assets for Net Wealth Tax	a	30	30

Table 1. Summary of the pre- and post-reform tax parameters (%).

⁴ In December 2004 the Finnish government announced of a decision to remove the net wealth tax altogether. This change will come into force as from January 2006. This study focuses on the reform package accepted in June 2004.

⁵ Top marginal rate in 2004. The range of state income tax: 0 % < 11700 euros, 11 % 11700-14500, 15 % 14500-20200, 21 % 20200-31500, 27 % 31500-55800 and ≥ 55800 34 %. The municipal income tax is 18.12 % on average and the church tax is 1.3 % on average. The employees' sickness insurance contribution is 1.5 %.

⁶ The Finnish tax code defines the rate as 13.5 per cent under the old system. This rate gives the maximum amount of *gross dividend* (cash dividend + imputation credit) taxable as capital income. Its cash dividend equivalent rate, comparable with the 9 per cent rate of the new system, is 9.585 per cent.

Social security contributions

The employer's social security contributions on the entrepreneur's wage income depend on whether the owner is registered under the employees' pension system (TEL) or the self-employed persons' pension system (YEL). The entrepreneur comes under the YEL scheme when he (with his family) owns more than 50 per cent of the CHC's shares.

Social Security Contribution	YEL	TEL
National Pension Insurance		
Employers	1.35*	1.35*
I	3.55*	3.55*
II	4.45*	4.45*
III		
Sickness Insurance		
Employers	1.614	1.614*
Pension Insurance		
Employers	21.4	21.59, 16.9–24.0*
Employees	0	4.6*
Unemployment Insurance		
Employers	0	0.6, 2.5*
Employees	0	0.25*
Soc. Sec. Contribution on the Actual Wage		
Employers	1.35–4.45*	20.464–32.564*
Employees	0	4.85*

* The base of the contribution is the actual wage.

Table 2. Summary of social security contributions in 2004 (%).

In the case of a YEL owner, the employer's pension contribution is calculated on the so-called YEL wage. The YEL wage is stipulated in the contract between the entrepreneur and the pension insurance company and because of this it is not directly connected to the actual wage of the owner. The YEL owner may deduct the contribution either from the firm's corporate tax base or his personal earned income tax base – depending on whether the firm or the owner pays the contribution. Under the TEL system, the employer's pension contribution is paid based on the actual wage. The rate of the TEL contribution depends positively on the number of employees.

A TEL owner is also liable to pay personal pension contributions and progressive unemployment insurance contributions on his personal wage. These contributions are deductible from his personal earned income. The YEL owner does not pay these contributions.

The employer's social security contributions also include the national pension insurance contribution and the sickness insurance contribution. The sickness insurance contribution is 1.614 per cent and the national pension insurance contribution is 1.35–4.45 per cent, depending on the size and capital intensity of the firm.⁷ In the case of a YEL owner, the sickness insurance contribution is based on the YEL wage and the national pension insurance contribution on the actual wage.

⁷ Class I: depreciation < 50.500 euros and < 10 % of wages; class II: depreciation > 50.500 euros and 10–30 % of wages; class III: depreciation > 50.500 euros and > 30 % of wages.

The above description implies that only the national pension contribution of a YEL owner is based on the actual wage. Other contributions are calculated on the fixed YEL wage. This means that only the national pension contribution should be included in the entrepreneur's marginal tax rate on wage income. In the case of a TEL owner, on the other hand, all social security contributions are based on the actual wage and thus increase the marginal tax rate.

3 Owner's choice between wages and dividends

Wages and dividends may be close substitutes as forms of remuneration that the entrepreneur can withdraw from the firm. In this section we analyse the owner's choice between the two income types under the assumption that the choice is solely grounded on tax considerations.

3.1 The model

To analyse the owner's choice, assume a CHC that earns an operating profit π and spends it on investments, I , or on remuneration to the owner-entrepreneur in the form of wages W or dividends D . On wages the firm is liable to pay employer's social security contributions at the rate s_f . Wages are deductible when the firm's taxable profit is calculated. Corporate income tax is paid at the rate τ_f . The firm's budget constraint is:

$$(1) \quad \pi = I + (1 + s_f)W + D + \tau_f [\pi - (1 + s_f)W].$$

The owner thus receives remuneration either as wages or dividends. On wage income the owner pays income tax at the effective rate τ_w and on dividends an amount of T_D determined according to the rules of the splitting system. The owner's net income is

$$(2) \quad NI = (1 - \tau_w)W + D - T_D - T_{NW},$$

where T_{NW} is net wealth tax. The effective MTR on wage income τ_w comprises the MTR on earned income τ_e and the employee's social security contribution s_w : $\tau_w = \tau_e + (1 - \tau_e)s_w$.

The net wealth tax is calculated as

$$(3) \quad T_{NW} = \tau_{nw}^* aN,$$

where τ_{nw}^* is the wealth tax rate and a is a valuation parameter taking values between (0,1) and reflecting the deviation of the taxable value of assets from their current value. N is current value of the net assets of the firm. The value of τ_{nw}^* depends on whether marginal net wealth tax is paid (see Chapter 4).

The pre- and post-reform tax on dividends under the Finnish splitting system can be written as follows:

$$(4) \quad T_D = \begin{cases} \tau_e^*(D - bN) + \tau_c^*bN, & \text{if } D > bN \\ \tau_c^*D, & \text{if } D \leq bN \end{cases},$$

where τ_e^* and τ_c^* are the personal-level effective marginal tax rates on cash dividend from the firm and b is the presumptive rate of return. ‘Effective’ here means that the tax rate takes into account the imputation credit in the pre-reform regime and the partial exemption of dividends under the post-reform regime. Equation (4) implies that dividend income is taxed up to the amount of bN , as capital income (normal dividend) and the amount exceeding the threshold is taxed as earned income (excess dividend).

Table 3 defines the effective tax rates under the pre- and post-reform regimes. u denotes the rate of imputation credit and equals the corporate tax rate τ_f under the pre-reform regime. τ_e is the MTR on earned income and τ_c is the tax rate on capital income.

Regime	Tax Rate τ_c^*	Tax Rate τ_e^*
Pre-reform	$\frac{\tau_c - u}{1 - u}$	$\frac{\tau_e - u}{1 - u}$
Post-reform $bN \leq 90000$ $bN > 90000$	0 $0.7\tau_c$	 $0,7\tau_e$

Table 3. Personal-level effective tax rates under pre- and post-reform regimes.

Table 4 gives numerical values for τ_c^* and τ_e^* . Under the pre-reform regime the imputation credit eliminates the personal-level tax burden on dividends taxed as capital income. The effective MTRs on dividends taxable as earned income are positive at the assumed marginal tax rates τ_e . Under the post-reform system τ_c^* is either zero or 19.6 per cent, depending on whether dividends exceed the 90,000 euro threshold. Also, at the level of the top tax rate on earned income, the 70 per cent rule of the post-reform regime leads to a fairly similar effective MTR as in the imputation system. At lower values of τ_e the new rule leads to a higher effective MTR, however.

Regime	Tax Rate τ_c^*	Tax Rate τ_e^*	
		MTR on Earned Income τ_e	
		34.92	54.92
Pre-reform	0	8.3	36.5
Post-reform $bN \leq 90000$ $bN > 90000$	0 19.6	24.4	38.4

Table 4. Numerical values of the effective tax rates (%).

3.2 Dividend vs. wage income

The owner's choice between dividend and wage income is analysed here by first solving the firm's budget equation (1) with respect to the owner's wage income, which gives:

$$(5) \quad W = \frac{1}{1+s_f} \pi - \frac{1}{(1+s_f)(1-\tau_f)} (D+I).$$

By inserting W from (5) and the tax equations from (3) and (4) into the owner's net income (2), we obtain

$$(6) \quad NI = \frac{1-\tau_w}{1+s_f} \pi - \frac{1-\tau_w}{(1+s_f)(1-\tau_f)} I + \left(1 - \frac{1-\tau_w}{(1+s_f)(1-\tau_f)}\right) D - \tau_e^* D + (\tau_e^* - \tau_c^*) bN - \tau_{mv} aN.$$

Now let us consider the effect of a small change in dividend income D on net income NI while keeping the profit constant. We obtain

$$(7) \quad \Delta NI = \left[(1-\tau_e^*) - \frac{1-\tau_w}{(1+s_f)(1-\tau_f)} \right] \Delta D.$$

In the pre-reform regime the multiplier term, denoted here by Ψ_{pre} , reduces to

$$(8) \quad \Psi_{pre} = \frac{(s_f + s_w)(1-\tau_e)}{(1+s_f)(1-\tau_f)}$$

and is positive with $s_f + s_w > 0$. Thus an increase in dividends at the expense of wages increases the owner's net income. This means that in the pre-reform system dividends are the tax-preferred form of remuneration assuming that part of the compensation is taxed as earned income. The main factor behind this observation is that the social security contributions s_f and s_w create a burden on wages but not on dividends.

Under the post-reform regime the multiplier term is

$$(9) \quad \Psi_{post} = \frac{(1-\tau_f)(1-0,7\tau_e) - \frac{(1-\tau_e)(1-s_w)}{1+s_f}}{(1-\tau_f)}.$$

Now Ψ can be negative or positive at feasible parameter values. Figure 1 illustrates this in the case of a YEL owner. We observe that Ψ is negative at low values of τ_e and increases with τ_e and s_f . This means that for high MTR entrepreneurs the optimal form of marginal compensation is dividends and vice versa. The break point of τ_e is 0.495 assuming $s_f = 0.0445$.

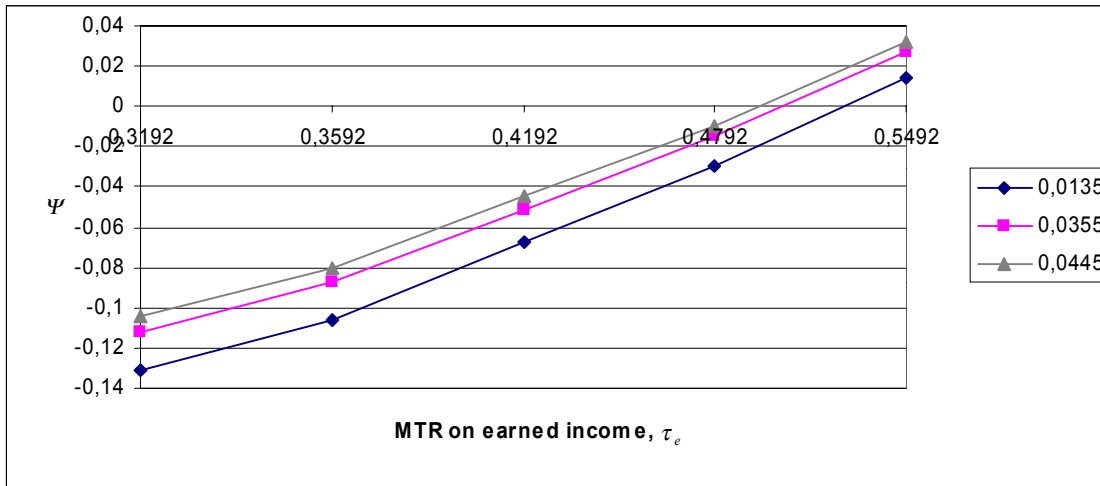


Figure 1. Multiplier term Ψ_{post} at different values of τ_e and s_f (YEL owner).

If we consider a TEL owner with $s_f = 0.20464$ and $s_w = 0.0485$, we observe that dividends are the preferred form of remuneration. The break-even value of τ_e is 0.183 which is below the flat tax rate on earned income in the first tax bracket.

Thus the analysis implies that the marginal source of internal finance may well change in the reform. Under the pre-reform regime it is dividends taxed as earned income and under the post-reform regime wages or dividends, depending on the tax rate and the pension system. In the latter case, the marginal source of funds is excess dividend for a YEL-entrepreneur with the highest MTR but wage income for an entrepreneur with the lower MTR.⁸ We will take this into account, when we calculate the cost of capital.

⁸ Under both systems normal dividends are usually the tax-preferred form of remuneration. The exception is the case in which the MTR of a YEL-entrepreneur is in either of the two lowest tax brackets under the post-reform system.

4 The CHC's cost of capital

In this section we derive the CHC's cost of capital under the Finnish dual income tax system before and after the 2005 reform. A simple indifference condition method is applied. The analysis focuses on the Finnish splitting system and the dividend tax changes. Because of this, depreciation rules and some other complicating aspects of the tax code are ignored. Considerable effort is put, however, into deriving the cost of capital for different income regimes, which are determined based on form in which the entrepreneur withdraws his marginal income (wage income, excess dividends or normal dividends). The type of marginal income is important since it determines how the owner is taxed on the marginal return on investment. It is important also because under internal financing this form of income is in fact the source from which the firm finances its investment. Thus the income type affects not only the marginal tax rate of the return on the investment but also the owner's opportunity cost of capital.

4.1 Deriving the cost of capital for different regimes

Consider a CHC, owned by a single owner, investing one euro in non-depreciable fixed assets and financing the investment by new equity or retained earnings. The firm's cost of capital can be derived from the following indifference condition that equates the owner's marginal net income after taxes, NI^* , and the opportunity cost of the marginal investment to the owner, $\rho\gamma$,

$$(10) \quad NI^* = \rho\gamma,$$

where ρ is the owner's post-tax rate of return requirement on the firm's investment and is determined as $\rho = (1 - \tau_c)r$, where r depicts the required gross rate of return on equity. γ is the market valuation of the owner's investment in the firm.

In the case of investment financed by retained earnings, the valuation coefficient γ reflects the differences in tax treatment of distributed profits and capital gains. To explain this, consider the use of one euro of after-tax profits either to reinvestment in the firm or to dividends (or wages). The former alternative generates an increase in the value of the firm's shares. As in standard corporate tax literature, the market price is now assumed to adjust such that the owner is indifferent as between selling his shares and withdrawing the after-tax dividends (see King 1974, Auerbach 1979, Sinn 1987). This means that γ can be derived from the following equation

$$(11) \quad (1 - \tau_g)\gamma = A,$$

where the lhs gives the after-tax capital gain from the sale of the shares and the rhs gives the owner's after-tax income from profit distribution (dividend or wage).

Table 5 defines the different income regimes in the pre- and post-reform tax systems. There are three main regimes which are determined according to the type of marginal income: wage, excess dividend or normal dividend. The two special features of the post-reform system, the 90,000 euro threshold and the deductibility of the capital income tax from the net wealth tax, create three additional sub-regimes for each main regime. There are thus nine different regimes in the post-reform tax system.

Table 5 also gives the market valuation and the effective marginal tax rates on dividends as capital income and earned income and on net wealth under all pre- and post-reform regimes. It also includes the effective marginal tax rate on wage income τ_w^* which was not defined above. Observe how the deductibility of the tax on normal dividends from the wealth tax affects the marginal tax rates τ_c^* and τ_{nw}^* . In sub-regime b, where income tax on normal dividends is below the amount of wealth tax, the effective tax rate on capital income is zero but on net wealth positive, $\tau_c^* = 0$ and $\tau_{nw}^* > 0$. In sub-regime c the opposite applies, $\tau_c^* > 0$ and $\tau_{nw}^* = 0$. Observe further that in the third regimes (Pre 3, Post 3) the valuation coefficient is affected by the taxation of wage income and not by dividends. This is because the marginal income form is wage.

Regime	Effective Marginal Tax Rate				Valuation Coefficient
	τ_c^*	τ_{nw}^* ⁹	τ_e^*	τ_w^*	γ
Pre-reform tax system					
Pre 1: Normal Dividend, $D < bN$	$\frac{\tau_c - u}{1 - u}$	τ_{nw}	-	-	$\frac{1 - \tau_c}{(1 - u)(1 - \tau_g)}$
Pre 2: Excess Dividend, $D \geq bN$	$\frac{\tau_c - u}{1 - u}$	τ_{nw}	$\frac{\tau_e - u}{1 - u}$	-	$\frac{1 - \tau_e}{(1 - u)(1 - \tau_g)}$
Pre 3: Wage instead of Excess Dividend	$\frac{\tau_c - u}{1 - u}$	τ_{nw}	-	$\frac{\tau_w + s_f}{1 + s_f}$	$\frac{1 - \tau_w}{(1 - \tau_f)(1 + s_f)(1 - \tau_g)}$
Post-reform tax system					
Normal Dividend, $D < bN$,					
Post 1a: $bN \leq 90000$,	0	τ_{nw}	-	-	$\frac{1}{1 - \tau_g}$
Post 1b: $bN > 90000 \wedge$ $\tau_{nw}aN \geq 0,7\tau_cD$,	0	τ_{nw}	-	-	$\frac{1}{1 - \tau_g}$
Post 1c: $bN > 90000 \wedge$ $\tau_{nw}aN < 0,7\tau_cD$	$0,7\tau_c$	0	-	-	$\frac{1 - 0,7\tau_c}{1 - \tau_g}$
Excess Dividend, $D \geq bN$,					
Post 2a: $bN \leq 90000$,	0	τ_{nw}	$0,7\tau_e$	-	$\frac{1 - 0,7\tau_e}{1 - \tau_g}$
Post 2b: $bN > 90000 \wedge$ $\tau_{nw}aN \geq 0,7\tau_cD$,	0	τ_{nw}	$0,7\tau_e$	-	$\frac{1 - 0,7\tau_e}{1 - \tau_g}$
Post 2c: $bN > 90000 \wedge$ $\tau_{nw}aN < 0,7\tau_cD$	$0,7\tau_c$	0	$0,7\tau_e$	-	$\frac{1 - 0,7\tau_e}{1 - \tau_g}$
Wage instead of Excess Dividend,					
Post 3a: $bN \leq 90000$,	0	τ_{nw}	-	$\frac{\tau_w + s_f}{1 + s_f}$	$\frac{1 - \tau_w}{(1 - \tau_f)(1 + s_f)(1 - \tau_g)}$
Post 3b: $bN > 90000 \wedge$ $\tau_{nw}aN \geq 0,7\tau_cD$,	0	τ_{nw}	-	$\frac{\tau_w + s_f}{1 + s_f}$	$\frac{1 - \tau_w}{(1 - \tau_f)(1 + s_f)(1 - \tau_g)}$
Post 3c: $bN > 90000 \wedge$ $\tau_{nw}aN < 0,7\tau_cD$	$0,7\tau_c$	0	-	$\frac{\tau_w + s_f}{1 + s_f}$	$\frac{1 - \tau_w}{(1 - \tau_f)(1 + s_f)(1 - \tau_g)}$

Table 5. The effective marginal tax rates and valuation coefficient for retained earnings under different income regimes.

⁹ Here we assume that the owner's taxable net wealth exceeds the threshold for net wealth tax. In the opposite case the effective tax rate τ_{nw}^* is zero, of course, when $bN \leq 90000$. As a result of the abolition of the net wealth tax from 2006 the deductibility of the capital income tax from the net wealth tax loses its meaning and the sub-regime b disappears.

4.2 Cost of capital for retained earnings

This section derives the cost of capital on investment financed by retained earnings. The formulae for new equity financing are given in the Appendix. The analysis starts from the pre-reform tax system.

4.2.1 The pre-reform tax system

Dividend income as the marginal source of finance

Let us first look at the case of normal dividends as the marginal income form. The owner's net income after taxes is derived from conditions (1)–(4) by considering a one-unit increase in the firm's capital stock and assuming $W = 0$. We obtain

$$(12) \quad NI^* = (1 - \tau_f)\pi - \tau_c^*(1 - \tau_f)\pi - \tau_{mw}^*a. \quad (\text{normal dividends})$$

When the withdrawn income exceeds the maximum amount of normal dividends and the owner prefers excess dividends to wages ($W = 0$), the owner's net income is

$$(12') \quad NI^* = (1 - \tau_f)\pi - \tau_e^*(1 - \tau_f)\pi + (\tau_e^* - \tau_c^*)b - \tau_{mw}^*a. \quad (\text{excess dividends})$$

The pre-reform cost of capital is now derived by using equations (12) and (12') and the relevant coefficients from Table 5. We obtain

$$(13) \quad \pi_{re}^{ndiv} = \frac{1 - \tau_c}{(1 - \tau_f)(1 - \tau_g)}r + \frac{\tau_{mw}a(1 - u)}{(1 - \tau_f)(1 - \tau_c)} \quad \text{and} \quad (\text{pre-1 regime})$$

$$(14) \quad \pi_{re}^{ediv} = \frac{1 - \tau_c}{(1 - \tau_f)(1 - \tau_g)}r - \frac{\tau_e - \tau_c}{(1 - \tau_f)(1 - \tau_e)}b + \frac{\tau_{mw}a(1 - u)}{(1 - \tau_f)(1 - \tau_e)}. \quad (\text{pre-2 regime})$$

If we ignore the last term on the rhs of condition (13), presenting the effect of wealth taxation, we observe that the cost of capital in the pre-1 regime corresponds to the normal-type cost of capital for an investment financed by retained earnings (see e.g. King-Fullerton 1984, Sinn 1987). As suggested by the so-called new view of dividend taxation, the cost of capital is not affected by dividend tax parameters. The cost of capital corresponds to the cost of capital for a widely held corporation (WHC).

The pre-2 regime cost of capital deviates from this in an important way. While the first term equals the first term in (13), there is, as reported earlier by Kari (1999) and Lindhe et al. (2003 and 2004), an additional term reflecting the effects of the splitting system for the CHCs. This second term in (14) depends on the difference between the tax rates on earned income and capital income and the presumptive rate of return b . With a positive tax rate differential the second term lowers the cost of capital and thus the cost of capital for the CHC is lower than for the WHC.

The last term in (13) and (14) is the effect of the net wealth tax on the cost of capital. Its value is positive if the owner's taxable net wealth exceeds the wealth threshold. The wealth tax terms differ between the regimes. This is because the wealth tax liability is financed from the after-tax marginal income, which is different in the two cases.

Wage income as a marginal source of finance

Due to the high tax rate on wage income, the owner is likely to prefer excess dividends to wage income as a compensation form in the pre-reform tax system (see section 3). However, here we present the cost of capital for the wage case. This is done in order to be able to compare the pre- and post-reform tax systems. The wage case is interesting also, because there may be other reasons for withdrawing income as wages. The owner's net income in the wage case is

$$(12'') \quad NI^* = \frac{1-\tau_w}{1+s_f} \pi + \left(1 - \frac{1-\tau_w}{(1+s_f)(1-\tau_f)}\right) b - \tau_c^* b - \tau_{mw}^* a. \quad (\text{wages})$$

Using this and the relevant parameters from Table 5 we obtain

$$(15) \quad \pi_{re}^w = \frac{1-\tau_c}{(1-\tau_f)(1-\tau_g)} r - \frac{\frac{(1-\tau_f)(1-\tau_c)}{1-u} - \frac{1-\tau_w}{1+s_f}}{(1-\tau_f) \frac{1-\tau_w}{1+s_f}} b + \frac{\tau_{mw} a}{\frac{1-\tau_w}{1+s_f}}. \quad (\text{pre-3 regime})$$

The first term on the right is again the standard-form cost of capital for investments financed by retained earnings. The second term measures the effects of the splitting system, which now depends on the difference between the after-tax normal dividend and the after-tax wage income. Unlike equations (13)–(14), the tax rates are presented on pre-corporation tax profit, since the owner's wages and social security contributions are paid out from untaxed profit. The third term is the effect of the net wealth tax.

4.2.2 The post-reform regime

Dividends as the marginal source of finance

The owner's net income after taxes in the post-1 regime is obtained by using (12) and the relevant tax parameters from table 5. The firm's cost of capital is now

$$(16) \quad \pi_{re}^{ndiv} = \frac{1-\tau_c}{(1-\tau_f)(1-\tau_g)} r + \frac{\tau_{mw} a}{1-\tau_f} \quad \text{or} \quad (\text{post-1a and 1b})$$

$$(17) \quad \pi_{re}^{ndiv} = \frac{1-\tau_c}{(1-\tau_f)(1-\tau_g)} r. \quad (\text{post-1c})$$

Again we observe that the first term is in its standard form and the new dividend tax rules have no effect. In regime post-1c the cost of capital is unaffected by wealth tax because the deductible income tax on normal dividends exceeds the amount of wealth tax. Thus, the owner does not pay wealth tax on the margin. In sub-regimes post-1a and 1b the wealth tax term takes a positive value since the owner's marginal tax rate is positive. There is either no income tax to be deducted from the wealth tax (post-1a) or the amount of income tax is below the amount of wealth tax (post-1b).

When the owner prefers to withdraw income as excess dividends, the marginal net income is obtained by using (12') and the parameters in Table 5. The cost of capital is

$$(18) \quad \pi_{re}^{ediv} = \frac{1-\tau_c}{(1-\tau_f)(1-\tau_g)} r - \frac{0.7\tau_e}{(1-\tau_f)(1-0.7\tau_e)} b + \frac{\tau_{nw}a}{(1-\tau_f)(1-0.7\tau_e)} \quad \text{or} \quad (\text{post-2a and 2b})$$

$$(19) \quad \pi_{re}^{ediv} = \frac{1-\tau_c}{(1-\tau_f)(1-\tau_g)} r - \frac{0.7(\tau_e - \tau_c)}{(1-\tau_f)(1-0.7\tau_e)} b. \quad (\text{post-2c})$$

The structures of the cost of capital formulae are familiar from above. The first terms correspond to the traditional cost of capital of internal financing. So the tax treatment of the marginal compensation form (dividends) is not reflected, as suggested by the 'new view' of dividend taxation. The second terms give the effects of the splitting system. The numerators include the tax rate differential, which is $0.7\tau_e$ in regimes post-2a and 2b and $0.7(\tau_e - \tau_c)$ in regime post-2c. In the first case the tax rate on normal dividends is not seen because there is no capital income tax liability on normal dividends due to the 90,000 euro threshold or due to the deduction from the wealth tax. In the second case (post-2c), the owner pays tax on normal dividends according to the effective rate $\tau_c^* = 0.7\tau_c$, as reflected in the formula. The third term is again the effect of the net wealth tax.

If we compare (18)–(19) to the corresponding condition (14) of the pre-reform system, we see two primary differences. The tax rate differentials in the numerators of the second terms differ. This is due to the dividend tax changes. The second difference concerns the change in the marginal tax rate on excess dividends in the denominators of the second and third terms (see Table 3).

Wage income as marginal source of finance

When the owner prefers wages to excess dividends, the cost of capital can be derived from the equation (12'') and the effective tax rates and the valuation coefficient from Table 5. We obtain

$$(20) \quad \pi_{re}^w = \frac{1-\tau_c}{(1-\tau_f)(1-\tau_g)} r - \frac{1-\tau_f - \frac{1-\tau_w}{1+s_f}}{(1-\tau_f)\frac{1-\tau_w}{1+s_f}} b + \frac{\tau_{nw}a}{\frac{1-\tau_w}{1+s_f}} \quad \text{or} \quad (\text{post-3a and 3b})$$

$$(21) \quad \pi_{re}^w = \frac{1-\tau_c}{(1-\tau_f)(1-\tau_g)} r - \frac{(1-\tau_f)(1-0.7\tau_c) - \frac{1-\tau_w}{1+s_f}}{(1-\tau_f)\frac{1-\tau_w}{1+s_f}} b. \quad (\text{post-3c})$$

The structure of the conditions is the same as above. The main changes concern the second term. As in (15), which considers the wage case under the pre-reform tax system, the effect of the splitting system is presented as depending on the difference between the after-tax amounts of income as between normal dividends and wages, paid out from one euro of pre-corporation tax profit. The reason for the change is the replacement of the full imputation system by a partial double taxation of normal dividends.

4.3 Cost of capital under income-splitting in Finland

This section illustrates the effects of the tax reform on investment incentives by calculating the cost of capital under the pre- and post-reform regimes. Both retained earnings and new share issues are considered as forms of financing.¹⁰ The values of the tax parameters in Table 1 are used. The effective tax rate on capital gains is 12 % under the pre-reform regime and 14 % under the post-reform regime. A YEL owner with $s_f = 4.45\%$ is considered. The owner's rate of return requirement before taxes is 7%. Observe that in a neutral tax system the cost of capital equals the owner's rate of return requirement, 7%. This rate can be used as an efficiency norm here: a deviation of the actual cost of capital from the norm implies a tax distortion. A lower (higher) actual cost of capital tells of a special incentive (disincentive) created by the tax system.

Table 6 presents calculations of the cost of capital for retained earnings. The tax reform lowers the cost of capital slightly – by 0.1 per cent point – if normal dividends are the marginal source of financing. This decrease is the result of two opposing changes. The cut in the corporate tax rate reduces the cost of capital (see equations (13) and (16)), while the increase in the capital gains tax rate pushes it up. In both pre and post-reform systems the cost of capital is above the neutrality norm, which tells of a tax disincentive. We observe that the 90,000 euro threshold does not affect the cost of capital. This is consistent with the new view of dividend taxation, which suggests that taxation of distributed income does not influence the cost of capital under internal financing.

Where the marginal source of finance is excess dividends or wages, the change depends on the marginal tax rate (MTR)¹¹ and also on whether the 90,000 euro threshold is exceeded in the post-reform system or not. At the highest MTR the cost of capital stays very low, close to zero. Thus, as reported earlier by Kari (1999) and Lindhe et al. (2003 and 2004), there seems to be a strong investment incentive in the Finnish tax system in such a case. At lower levels of MTR the cost of capital may decrease considerably. The reason for this latter outcome is that where normal dividends are below 90,000 euros, the gap between the effective tax rates on earned income and capital income is wider in the new system than in the old one (see Tables 3 and 4). These results are also applicable when the owner pays wealth tax on the margin. Thus we can conclude that, despite the tightening of dividend taxation, the incentives to invest are made stronger in most of the cases cited in Table 6. Observe that also at low and medium levels of MTR the cost of capital is in most cases below the neutrality norm of 7%. Thus, the special investment incentives created by the splitting system do not only concern a narrow group of high MTR entrepreneurs. The cost of capital is also below the cost of capital for the WHC (marked bold in the tables).

Similar conclusions apply to the case of new share issues (Table 7). If excess dividends are the marginal income form, however, the reductions in the cost of capital are smaller than in Table 6. If the 90,000 euro threshold is exceeded, the rise in the cost of capital is higher than in Table 6. The latter result implies that the reform reduces wealthy individual investors' incentives to provide new outside equity to CHCs.

¹⁰ The cost of capital for investment financed by debt is in fact 7 per cent in both tax systems assuming that the owner's rate of return requirement (7 per cent) corresponds to the market interest rate. This result assumes of course that the asset is non-depreciable or that the depreciation for taxation purposes equals the economic depreciation.

¹¹ The calculations make the simplifying assumption that the tax code changes do not affect the owner's MTR on earned income.

Net Wealth Tax	Regime	Marginal Income Form					
		Normal Dividend, $D \leq bN$,	Excess Dividend, $D > bN$, (.) as Wage Marginal Tax Rate on Earned Income				
			31.92	35.92	41.92	47.92	54.92
No Net Wealth Tax (in the margin)	Post-reform $\leq 90\,000\ \text{€}$		4.4 (6.3)	3.8 (5.4)	2.9 (3.9)	1.8 (2.0)	0.32
	$> 90\,000\ \text{€}$	7.9	7.5 (9.0)	7.0 (8.3)	6.2 (7.1)	5.4 (5.6)	4.2
	Pre-reform	8.0	7.4	6.5	5.0	3.1	0.2
Net Wealth Tax (in the margin)	Post-reform ¹² $\leq 90\,000\ \text{€}$						
	$> 90\,000\ \text{€}$	8.2	4.8 (6.6)	4.3 (5.8)	3.3 (4.3)	2.3 (2.5)	0.85
	Pre-reform	8.3	7.8	6.9	5.4	3.6	0.8

Table 6. The cost of capital for retained earnings (%).

Net Wealth Tax	Regime	Marginal Income Form					
		Normal Dividend $D \leq bN$,	Excess Dividend, $D > bN$, (.) as Wage Tax Rate on Earned Income				
			31.92	35.92	41.92	47.92	54.92
No Net Wealth Tax (in the margin)	Post-reform $\leq 90\,000\ \text{€}$	6.8	5.3 (6.1)	5.0 (5.7)	4.6 (5.0)	4.1 (4.2)	3.5
	$> 90\,000\ \text{€}$	8.5	8.3 (8.8)	8.2 (8.6)	8.0 (8.2)	7.7 (7.8)	7.3
	Pre-reform	7.0	6.7	6.3	5.6	4.6	3.3
Net Wealth Tax (in the margin)	Post-reform ¹² $\leq 90\,000\ \text{€}$						
	$> 90\,000\ \text{€}$	7.1	5.7 (6.5)	5.4 (6.1)	5.0 (5.5)	4.6 (4.7)	4.0
	Pre-reform	7.4	7.1	6.7	6.0	5.2	3.9

Table 7. The cost of capital for new equity issues (%).

¹² The abolition of the net wealth tax from 2006 removes this regime.

Under the pre-reform regime the cost of capital for new equity issues is in most cases lower than that for retained earnings. The reform makes internal financing the preferred form of financing, especially in the case of excess dividends or wages as the marginal income form. The reason for the change is the abandonment of the full imputation system.

The net wealth tax raises the cost of capital by 0.3–0.6 percentage points, if paid on the margin. Observe that there is no difference in the cost of capital between the cases above and below the 90,000 euro threshold, if net wealth tax is paid on the margin. This is because the tax credit leads to a zero marginal tax rate on capital income in sub-regime b (see section 4.1). The effect of the deductibility of income tax from wealth tax on the cost of capital is in fact important, about 3–4 percentage points, which can be seen by comparing the post-reform figures between the cases of “no net wealth tax, >90 000€” and “net wealth tax included”.

Chapter 3 made the point that it may be more advantageous to withdraw income as wage income than excess dividends under the post-reform regime. In Tables 6 and 7 the figures in brackets give the cost of capital for the case in which wages are the preferred form of compensation. Perhaps contrary to expectations, when we allow for this tax planning, we obtain higher values for the cost of capital. This is because the tax rate differential between earned income and capital income is smaller for wage income than for excess dividends. This is due to the lower marginal tax rate of wage income. From the lower tax rate differential follows that the special investment incentive created by the splitting system and reflected in the second terms of formulae (18)–(22) becomes smaller. Thus the tax planning opportunity dampens the effects of the dividend tax changes on the cost of capital.¹³

¹³ In fact – not analysed explicitly here – a dampening occurs also in the case of normal dividends exceeding 90 000 euro. According to our calculations the cost of capital is increased from 7.0 to 8.5 for the investment financed by a new share issue. If the owner utilises the tax planning opportunity, the cost of capital decreases to 7.7 and 8.2 on the level of two lowest MTRs. Now the tax planning lowers the cost of capital, since the effect of the tax rate difference does not exist.

5 Summary

This paper addresses effects of the Finnish corporate and capital income tax reform, effective as of 2005, on the investment incentives of a closely held company (CHC). The main changes in the reform are the abandoning of the full imputation system and the introduction of a partial dividend relief. Other elements are reductions in tax rates and the exemption of capital gains from sales of shares in corporate taxation. There are also reductions in net wealth taxation.

Before analysing the effect of the reform on the firm's cost of capital, we look at how the reform affects entrepreneurial tax planning. We do this because changes in tax planning may have important repercussions on investment incentives. In terms of tax planning measures, we focus on the owner's choice between different compensation forms viz. dividends and wages. While there are in practice other ways to withdraw funds or benefits from the firm, these two forms are probably the most important ones, especially from the point of view of marginal forms of income.

The analysis shows that under the pre-reform regime the entrepreneur prefers excess dividends to wages as the form of compensation. This is firstly due to the full imputation system, which eliminates entirely the double taxation of dividends, and secondly due to social security contributions, which are imposed on wages but not on dividends. Under the post-reform regime, wages may be the preferred way to withdraw income from the CHC. This is especially true at low MTRs on earned income and where the employer's social security contributions are paid at a low rate.

The burden on withdrawn wage created by social security contributions depends on which pension system the entrepreneur belongs to, the employees' pension system (TEL) or the self-employed persons' pension system (YEL). In the case of a YEL entrepreneur, the social security contribution rate on actual wages is very low since most of the liability is based on the so-called YEL wage, which is a fixed lump-sum wage, contracted at the time the firm joined the pension system, and has no direct connection to actual wages. Thus we conclude that, for investments financed by retained earnings, the marginal source of funds is excess dividends under the pre-reform regime and, in the case of a YEL owner, wage income at low levels of earned income and excess dividends at higher income levels.

Our analysis indicates that the reform increases the complexity of the tax system. This is seen in our analysis from the increase in the number of different regimes within each of which the cost of capital is determined differently.

Our cost-of-capital calculations imply that, in most cases, the reform lowers the cost of capital for investments and especially those financed by retained earnings. This is mostly due to the increased tax rate difference between the effective MTR on earned income and the MTR on capital income. Using reasonable assumptions on the owner's rate of return requirement, the cost of capital of most CHC's seems to be below the required return. This means that the post-reform system encourages internally financed growth for most CHC's.

The incentives to invest to the CHCs are higher than to the WHCs too. The owner's opportunity to choose wages instead of excess dividends dampens the decrease in the cost of capital. This is due to the decreased tax rate difference. The deduction of capital income tax from wealth tax reduces the cost of capital in an important way. The MTR on capital income would be effective and increase the cost of capital without the deduction.

However, especially for new equity issues, the reform increases the cost of capital in some cases. The rise is substantial in cases where the owner withdraws normal dividends in excess of the 90,000 euro threshold and the deduction from wealth tax does not eliminate this tax burden. This implies that the reform reduces wealthy individual investors' incentives to provide new outside equity to CHCs.

References

- Auerbach, A. (1979): Wealth maximization and the cost of capital. *Quarterly Journal of Economics* 94, 433–436.
- Bond, S. R. and Devereux, M. P. (1995): On the design of a neutral business tax under uncertainty. *Journal of Public Economics* 58, 57–71.
- Bond, S. R. and Devereux, M. P. (2003): Generalised R-based and S-based taxes under uncertainty. *Journal of Public Economics* 87, 1291–1311.
- European Commission (2003): Dividend taxation of individuals in the internal market, Communication from the Commission to the Council, the European Parliament and the European Economic and Social Committee. Commission of the European Communities, Brussels.
- Fane, G. (1987): Neutral taxation under uncertainty. *Journal of Public Economics* 33, 95–105.
- Fjærli, E. and Lund, D. (2001): The choice between owner's wages and dividends under the dual income tax. *Finnish Economic Papers* 14, 104–119.
- Hagen, K. P. and Sørensen, P. B. (1998): Taxation of income from small businesses: Taxation principles and tax reforms in the Nordic countries. In Sørensen, P. B. (ed.): *Tax Policy in the Nordic Countries*. Macmillan Press Ltd, London.
- Kanniainen, V., Kari, S. and Ylä-Liedenpohja, J. (2004): The Nordic dual income taxation of enterprises. Paper presented in the Third Norwegian-German Seminar on Public Economics, CESifo, Munich, June 20–21, 2003.
- Kari, S. (1999): Dynamic behaviour of the firm under dual income taxation. *VATT Research Reports* 51, Government Institute for Economic Research, Helsinki.
- King, M.A. (1974): Taxation and the cost of capital. *Review of Economic Studies* 41, 21-35.
- King, M. A., and Fullerton, D. (1984): The taxation of income from capital. University Chicago Press, Chicago.
- Lindhe, T., Södersten, J. and Öberg, A. (2002): Economic effects of taxing closed corporations under the Nordic dual income tax. *Ifo Studien* 4/2002, 611–632.
- Lindhe, T., Södersten, J. and Öberg A. (2003): Economic effects of taxing different organizational forms under the Nordic dual income tax. *Working Papers 2003:19*, Department of Economics, Uppsala University.
- Lindhe, T., Södersten, J. and Öberg A. (2004): Economic effects of taxing different organizational forms under the Nordic dual income tax. *International Tax and Public Finance* 11, 469–486.
- Panteghini, P. M. (2001): Dual income taxation: The choice of the imputed rate of return. *Finnish Economic Papers* 14, 5–13.

Sinn, H.-W. (1987): Capital income taxation and resource allocation. New-Holland, Amsterdam.

Sinn, H.-W. (1991): The vanishing Harberger triangle. *Journal of Public Economics* 45, 271–300.

Sørensen, P. B. (2003): Neutral taxation of shareholder income: A Norwegian tax reform proposal. *CESifo Working Paper 1036*, CESifo, Munich.

Appendix. The cost of capital for new equity issues

When a marginal investment is financed by a new equity issue, the valuation coefficient takes the value $\gamma = 1$. The cost of capital is derived in exactly the same way as above. The differences of the cost of capital are in the first terms of the formulas and they are due to the valuation coefficient.

The pre-reform regime

The owner distributes marginal income as dividends:

$$\pi_{ne}^{ndiv} = \frac{1-\tau_c}{1-\tau_f} r + \frac{\tau_{mw} a (1-u)}{(1-\tau_f)(1-\tau_c)} \quad (\text{pre-1})$$

and

$$\pi_{ne}^{ediv} = \frac{(1-u)(1-\tau_c)}{(1-\tau_f)(1-\tau_e)} r - \frac{\tau_e - \tau_c}{(1-\tau_f)(1-\tau_e)} b + \frac{\tau_{mw} a (1-u)}{(1-\tau_f)(1-\tau_e)}. \quad (\text{pre-2})$$

The owner withdraws excess dividend income as wages:

$$\pi_{ne}^w = \frac{1-\tau_c}{1+\tau_f} r - \frac{\frac{(1-\tau_f)(1-\tau_c)}{1-u} - \frac{1-\tau_w}{1+\tau_f}}{(1-\tau_f) \frac{1-\tau_w}{1+\tau_f}} b + \frac{\tau_{mw} a}{\frac{1-\tau_w}{1+\tau_f}}. \quad (\text{pre-3})$$

The post-reform regime

The owner distributes income as normal dividends:

$$\pi_{ne}^{ndiv} = \frac{1-\tau_c}{1-\tau_f} r + \frac{\tau_{mw} a}{1-\tau_f} \quad (\text{post-1a and 1b})$$

and

$$\pi_{ne}^{ndiv} = \frac{1-\tau_c}{(1-\tau_f)(1-0.7\tau_c)} r. \quad (\text{post-1c})$$

The owner distributes income as excess dividends:

$$\pi_{ne}^{ediv} = \frac{1-\tau_c}{(1-\tau_f)(1-0.7\tau_e)} r - \frac{0.7\tau_e}{(1-\tau_f)(1-0.7\tau_e)} b + \frac{\tau_{mw} a}{(1-\tau_f)(1-0.7\tau_e)} \quad (\text{post-2a and 2b})$$

and

$$\pi_{ne}^{ediv} = \frac{1-\tau_c}{(1-\tau_f)(1-0.7\tau_e)} r - \frac{0.7(\tau_e - \tau_c)}{(1-\tau_f)(1-0.7\tau_e)} b . \quad (\text{post-2c})$$

The owner withdraws excess dividend income as wages:

$$\pi_{ne}^w = \frac{1-\tau_c}{1+s_f} r - \frac{1-\tau_f - \frac{1-\tau_w}{1+s_f}}{(1-\tau_f) \frac{1-\tau_w}{1+s_f}} b + \frac{\tau_{mw} a}{1+s_f} \quad (\text{post-3a and 3b})$$

and

$$\pi_{ne}^w = \frac{1-\tau_c}{1+s_f} r - \frac{(1-\tau_f)(1-0.7\tau_c) - \frac{1-\tau_w}{1+s_f}}{(1-\tau_f) \frac{1-\tau_w}{1+s_f}} b . \quad (\text{post-3c})$$