

SMALL CORPORATIONS' INCOME SHIFTING THROUGH CHOICE OF OWNERSHIP STRUCTURE – A NORWEGIAN CASE*

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We analyze how small business owners respond to the tax-minimizing incentives inherent in the Norwegian version of the dual income tax to shift income from the personal to the corporate tax base. The corporations in our sample seem to respond to tax incentives and change their ownership structure to qualify for a reduction in overall tax payments. We document substantial cohort effects and suggest that postreform corporations were better able to form tax-reducing coalitions, compared with prereform corporations. It also appears that corporations who participate in this activity are more profitable and have more to gain from tax-minimizing income shifting. (JEL: D21, H25, H3)

1. Introduction

In several countries, corporations – and their owners – have ample opportunities to adopt tax-reducing strategies. Within the corporate sector, studies have found that reported corporate profits are sensitive to differences in tax rates of

wages and retained corporate profits (Gordon and Slemrod 2000, and de Mooij and Nicodème 2008). What may seem to be increased business activity, with an increasing number of corporations and increased reporting of corporate income, could in fact be the result of tax-minimizing income shifting between the personal and

** Acknowledgments: Comments from Michael Riis Jacobsen, Vesa Kanniaainen, Wojciech Kopczuk, Joel Slemrod, and an anonymous referee are much appreciated, as are comments from seminar participants at University of Stavanger, Statistics Norway, and Nordic Workshop on Public Economics, Uppsala 2008.*

Alstadsæter is affiliated with CESifo and benefited from a research stay at CES, University of Munich, and from financial support from the Academy of Finland. Both authors were affiliated with Statistics Norway when work on this project began, and we thank the Research Council of Norway for grant 168221/S20.

corporate tax bases. Small business owners to a large extent determine whether to compensate their own labor effort in the form of wages or capital income, which has an immediate effect on the corporation's wage costs and reported profits. Other studies have investigated firms' choice of organizational form as means of reducing their tax burdens, but with ambiguous results.¹ This is not surprising, because choice of organizational form is influenced by both nontax and tax considerations, as also argued by Egger, Keuschnigg, and Winner (2009).

In the present paper we suggest a framework for describing the extent of *income shifting* and *choice of tax regime* as a means to reduce tax payments. The former term refers to reclassification of accounting items to reduce total tax burden, the latter to changes in ownership structure, or organizational form, that imply a broad change in the tax rules facing a firm. The specific case we consider is the Norwegian version of the dual income tax. Taxation of labor income is progressive and taxation of capital income is proportional, with marginal tax rates on wage income being substantially higher than marginal taxes on capital income.² To prevent income shifting from the labor income tax base to the capital income tax base, an income splitting system splits the income from a small business into an imputed return to the active owners' labor effort and an imputed return to the invested capital.³

The tax code defines what we refer to as the *closely held tax regime* and the *widely held tax regime*. Corporations are taxed under the closely held tax regime if more than two thirds of their shares belong to active owners. The split model applies to these corporations, and the tax au-

thorities calculate imputed return to labor and imputed return to capital. For the active owners, the imputed return to labor is taxed as wages at the progressive rate, while the imputed return to capital is taxed as capital income.⁴ Corporations are taxed under the widely held regime if the active owners own less than two thirds of the shares. In Section 2 we provide more details on the Norwegian split model of dual income taxation. We discuss corporations' incentives for participating in income shifting and for choosing among the two tax regimes. The incentives are particularly strong for active owners of corporations with few employees and low capital levels. In some cases, the total after-tax income can be increased by 60 % through tax-reducing activity.

In Section 3 we present data from two administrative registers that cover the entire population of Norwegian corporations. The sample size is more than 64,000 observations of small- to medium-sized corporations in the period 1993–2002.⁵ These data are analyzed in Section 4 in two separate analyses. In the first analysis we provide a model for income shifting and compare corporations with similar observable characteristics. For some corporations, the results suggest that corporations under the widely held tax regime have up to 41% higher profits than comparable corporations under the closely held tax regime. This is consistent with the prediction from Section 2 that some corporations will have incentives to 1) choose the widely held tax regime and 2) participate in income shifting, by reducing wages and increasing profits (to be paid as dividends). In the second analysis we provide a model for the choice of tax regime. We find that the share of corporations choosing the widely held regime is declining in number of employees and increasing in asset value. The former result is consistent with the tax incen-

¹ Confer Gordon and MacKie-Mason (1994), Gentry (1994), Ayers et al. (1996), MacKie-Mason and Gordon (1997), Goolsbee (1998, 2004), Romanov (2006), and Egger, Keuschnigg, and Winner (2009).

² See Sørensen (1994), Hagen and Sørensen (1998) for more on dual income tax.

³ The Nordic countries introduced different versions of an income splitting system, which splits the income from a small business into an imputed return to the active owners' labor effort and an imputed return to the invested capital. The Finnish, Norwegian, and Swedish income splitting systems are described and compared by Lindhe et al. (2004), and Hietala and Kari (2006) describe the Finnish income splitting system in detail.

⁴ The split model of dual income taxation was abolished for corporations through the introduction of the shareholder income tax in 2006, which is a partial tax on dividend income and capital gains. For more on the shareholder income tax, see Sørensen (2005), Griffith, Hines and Sørensen (2008), Crawford and Freedman (2008), and Alstadsæter and Fjærli (2009).

⁵ Assets between 10,000 NOK and 15,000,000 NOK; Number of employees between 1 and 15.

tives described in Section 2, while the latter may be because of dominating nontax motives.

We find that corporations founded prior to the 1992 tax reform differ systematically from corporations founded after the reform. This may suggest that postreform corporations were better able to form tax-reducing coalitions, compared with prereform corporations. A corresponding effect is found when comparing profits: widely held corporations with low capital levels and few employees have higher profits than the corresponding closely held corporations. This suggests that it is corporations with higher potential reduction in their tax payments that actually participate in this income shifting through changing their ownership structures. Section 5 concludes.

2. *Income-shifting potential, tax regime-shifting potential and tax-reducing coalitions*

Consider a corporation with concentrated ownership that generates a given annual profit. How can the owners receive most of this profit after taxes? This is a simultaneous tax minimization problem of income shifting and choice of tax regime. Let us divide this into different subproblems. First, for each tax regime, which is the optimal wage-dividend scheme for the owners? Second, given the optimal solutions for both tax regimes, which is the optimal regime? In this approach it is useful to decompose the overall potential gain from these tax-minimizing activities into *income-shifting potential* and *tax regime-shifting potential*. These concepts can be compared with the more familiar concept of potential Pareto improvements, where a policy change that makes the society as a whole better off can be considered a Pareto improvement as long as the individuals who gain can compensate those who lose through a cash transfer.

As an illustration, suppose a corporation is operating under the closely held tax regime. The total payable tax depends (among other things) on the proportions of profits distributed as dividends and paid as wage compensation to the owners, and on individual tax rates on labor income. If the owners simply decide to pay wage compensation according to each owner's actual

labor effort, and let the resulting profits be distributed as dividends according to ownership shares, there usually remains a potential Pareto improvement. If the owners agree on a different wage-dividend scheme, the group as a whole could be better off, and if they can agree on side-payments, they may all be better off. Similarly, the owners could in principle choose a wage dividend scheme that makes them worse off. The difference between the best and the worst schemes within a tax regime, measured in after-tax income, is what we define as *income-shifting potential*.⁶

Similarly, the owners could find the optimal wage dividend scheme under the widely held regime. The difference between optimal solutions in the two tax regimes is what we define as *tax regime-shifting potential*. If the tax regime-shifting potential is nonzero and the corporation is currently operating under the least favorable regime, there exist potential Pareto improvements. An agreement, with side payments, between active and passive owners could make all parties better off.

Let us refer to this type of owner coalition as a tax-reducing coalition. The income-shifting and regime-shifting potential of a *tax-reducing coalition* exist even though they are, for various reasons, not realizable. We use these theoretical concepts as measures of incentives for participation in tax-reducing activities.

There are several examples of such tax-reducing coalitions, where both legal and illegal means are used to distribute tax savings among participants. First, if the passive owners are the active owner's children over the age of 18, dividend payments to passive owners are tax exempt transfers within the family. The active owner could then internalize this as his/her own income and automatically choose the optimal wage dividend scheme for the coalition. Second, two business owners with similar income potential

⁶ A related phenomena is documented by Fjærli and Lund (2001). They analyze how owners of corporations choose to pay wages and dividends during a transition period into dual income tax in Norway. They conclude that owners pay themselves more than optimal wages from a short-term tax reduction perspective, and suggest that this can be optimal from a long-term view, as wage payments are the basis for future pension benefits.

may swap ownership shares and be passive owners in each other's corporations to be classified as widely held corporations. Third, a corporation may have pro-forma passive owners, to whom only a proportion of or no reported dividends are actually paid.

2.1. The Norwegian dual income tax

The Norwegian tax system in the period 1992–2005 was a dual income tax system that levied separate tax schedules on income from labor and capital. It combined a low proportional tax rate on capital income of 28 % with a progressive tax rate on labor income. In addition, a geographically differentiated payroll tax (the employers' social security contribution) applied to all wage payments, in the range of 0–14.1 %. The total highest marginal tax rate on labor income (including the payroll tax) was 59 % in 1992 and 58 % in 2005. The corporate tax rate was 28 %, the same as the capital income tax rate. Dividends were tax exempt in the period 1992–2005.⁷ Capital gains were taxed at 28 %, but there was no double taxation of realized capital gains on shares that originated in withheld firm profits. When taxable capital gains on realized shares were computed, a deduction was allowed for accumulated profits retained in the corporation, as these were already taxed at 28 % at the corporate level.

During this period, marginal tax rates on labor income varied, with the greatest difference between the highest marginal tax rates on labor income and capital income being 36.7 percentage points, which provided individuals in medium and high labor income classes with great incentives to participate in tax-minimizing income shifting from labor income to capital income. The split model of dual income taxation was designed to prevent this income shifting, and it applied to sole proprietors and closely held corporations. In this paper we only consider income shifting through the choice of ownership composition of an existing corporation. Alstadsæter (2007) and Thoresen and Alstad-

sæter (2008) analyze income shifting in the firm through the choice of organizational form, and also describe the impact of the split model on a self-employed individual.

Thus, the Norwegian corporate tax system consisted of two distinct tax systems, which we refer to as the *widely held regime* and the *closely held regime*. A corporation was defined as closely held if two thirds or more of its shares were held by active owners. An owner was defined as active if he/she worked more than 300 hours annually in the corporation, and as passive otherwise. Spouses and children (below the age of 18) of an active owner were also considered active owners for tax purposes, even if they did not work in the firm.⁸ This was to avoid income shifting through the transfer of ownership shares to family members.

A corporation was defined as widely held if less than two thirds of the shares were held by active owners. For widely held corporations, profits were taxed at the proportional tax rate and dividends to owners were tax exempt. The same rules applied to closely held corporations, but in addition an imputed return to labor was calculated and added to the active owners' labor income tax base. The imputed return to labor was business profits net of imputed return to capital in the corporation, up to a threshold, and net salary deduction.⁹ The imputed return to capital was calculated by multiplying the value of the capital assets by a fixed rate of return on capital, which during the period varied from 10 % to 16 %. If imputed labor income was negative, the loss did not offset other income; it could be carried forward and deducted from future imputed labor income in the same firm. The imputed return to labor was taxable regardless of whether the owners had received payment from the corporations. The split model and the incentives for income shifting are described and analyzed by Hagen and Sørensen (1998), Lindhe et al. (2004), Alstadsæter (2007), and Thoresen and Alstadsæter (2008).

⁷ The exception is 2001, when a dividend tax of 11 % applied to all dividends above a threshold.

⁸ For firms in liberal professions, these identification rules also considered siblings, adult offspring and parents of the active owner as active owners for tax purposes.

⁹ The salary deduction was for the broader part of the period 20 % of the corporation's total wage costs.

Throughout the period, the difference between the highest marginal tax rates on labor and capital increased, and it became easier to participate legally in income shifting between the tax bases through more lenient regulations within the split model. This is one contributing factor to the ten-fold increase in dividend income of households from 1993 to 2005, as discussed by Alstadsæter and Fjærli (2009).

2.2. A stylized description of the two Norwegian tax regimes

We now present a stylized model to describe the main features of the Norwegian dual income tax system. Two main simplifying assumptions deserve special attention.

First, we choose a single-period framework; i.e., we consider a corporation that is operative in a single year only. This means that we disregard intertemporal reallocations that may have served to reduce the tax burden. In our view, expanding the model to a multiperiod framework would add little to illuminate our main points. A fact that supports this view is that important parts of the tax system, in particular regarding capital gains taxation as explained above, were designed to avoid incentives for intertemporal income shifting.

Second, we treat economic activities within the corporation as given. This includes, for instance, an owner's decision regarding his or her labor input into the corporation's activities. Similarly, investment decisions – and the decision to incorporate – are taken as given or predetermined. We do not dispute that these assumptions imply that our model disregards several aspects relevant to actual corporations and their owners. However, a benefit of this assumption is that the model description is closely related to data that are fully observable by the tax authorities. Tax records typically contain data on decisions ex post, while the full ex ante choice set – such as the full production function or potential partners for forming tax-reducing coalitions – of corporations and owners are hardly ever obtainable.

To summarize, we consider a corporation that is operative in a single year only, and we abstract real decisions such as those concerning produc-

tion levels, investments, and number of employees. For simplicity we also assume that the corporation has just one active owner. The owner's income from other sources is disregarded, but could potentially be incorporated into the tax function $T_w(\cdot)$ specified below.

In this context, we seek to answer two questions. If potential passive owners exist – so that tax-reducing coalitions can be formed – how much can after-tax income be affected by income shifting between wages and dividends? And how much can after-tax income be affected by choice of tax regime? To simplify matters we only focus on the benefit to the coalition as a whole, and not on how the total benefit is distributed among the coalition members.

Assume that there is fixed net revenue in the corporation to be distributed to the active and passive owners in the coalition, either as wages of the active owner, W , or dividends, D , to all owners. The main objective is to maximize total after-tax income of the coalition as a whole. Any conflicts of interest between active and passive owners are disregarded, or assumed to be perfectly solvable by side payments. The after-tax income of the coalition as a whole is denoted Y , and is defined by

$$(1) \quad Y = W + D - [T_w(W + I) - t_c I],$$

where the expression in the brackets constitutes the payable personal taxes of the coalition. Here, $T_w(\cdot)$ – a piecewise linear, nondecreasing and continuous function – is the tax amount payable on the sum of wages and imputed return to labor, and I , and t_c is the flat capital tax rate. The imputed return to labor is only computed by the tax authorities, not actually received by the individual. It is part of the taxable profits of the corporation. Thus, when labor income taxes due on imputed return to labor on the personal level are calculated, taxes paid on the corporate level $t_c I$, are deducted. This is also clear from equation (4). Dividends are tax exempt on the owners' hands.

After-tax income depends both on how the corporate income is distributed to its owner, and on the tax regime. We will illustrate this by showing that D and I can be replaced by simple functions of W . An intermediate definition of

profits is useful, because profits affect both dividends and imputed return to labor. In this context we therefore define the profit of the corporation, π , as

$$(2) \quad \pi = R - (1 + t_p)W, \quad \pi \geq 0, \quad R \geq 0,$$

where R is a fixed value of net revenue (total revenue less all costs other than owner’s wage compensation), and t_p is the payroll tax rate. In general, positive profits are taxed at the flat rate of t_c . The restriction requiring nonnegative profits imposes an upper bound on the owner’s wage compensation, \bar{W} , thus the admitted interval for W is:

$$(3) \quad 0 \leq W \leq \bar{W} \equiv \frac{R}{1 + t_p}.$$

In our setup, all profits are distributed as dividends, D , which in turn can be considered as a function of wages:

$$(4) \quad D = (1 - t_c)\pi = (1 - t_c)(R - (1 + t_p)W), \quad D \geq 0.$$

The main difference between the closely held and the widely held tax regimes is the imputed return to labor:

$$(5) \quad I = \begin{cases} 0, & \text{if widely held} \\ \max[0, \pi - I_0 - sW] = \\ \max[0, R - I_0 - (1 + t_p + s)W], & \\ \text{if closely held,} \end{cases}$$

where I_0 is deductions due to imputed return to capital or salaries to employees other than the active owner, and s is the salary deduction factor.¹⁰ In our one-year setup, negative values of imputed return to labor are disregarded, and only positive values influence the active owner’s after-tax income.

Inserting I and D in equation (1), we obtain expressions for the after-tax income as a function of the active owner’s wage compensation. In both tax regimes, after-tax income is a piecewise continuous function of W . To maximize after-tax

income we need to check the endpoint of the admitted interval for W and all points where either of the tax regime-specific functions has a kink.

2.3. Illustration by numerical examples

The main features of the Norwegian tax system can more easily be illustrated if we impose a simplifying assumption: we disregard the progressive structure of the actual tax system and assume that there is a fixed tax rate on labor income. This is expressed as $T_w = t_w \cdot (W + I)$, where $t_w \geq t_c$ is the constant tax rate. In this case the after-tax income for widely held corporations can be written as

$$(6) \quad Y_{wh}(W) = (1 - t_c)R + ((1 - t_w) - (1 - t_c)(1 + t_p))W, \quad W \geq 0,$$

which is a simple linear function. For closely held corporations, the after-tax income can be written as

$$(7) \quad Y_{ch}(W) = \begin{cases} Y_{wh}(W) - (t_w - t_c)(R - I_0 - (1 + t_p + s)W), & \\ \text{if } 0 \leq W \leq \hat{W} & \\ Y_{wh}(W), & \\ \text{if } W \geq \hat{W} & \end{cases},$$

where $\hat{W} = (R - I_0)/(1 + t_p + s)$. This function is piecewise linear with a kink for $W = \hat{W}$. It follows from the assumptions that $Y_{wh}(0) \geq Y_{ch}(0)$.

We first turn our attention to the income-shifting potential. The derivatives with respect to W are useful for this purpose. For widely held corporations the derivative is

$$(8) \quad Y'_{wh}(W) = -(t_w - t_c) - t_p(1 - t_c), \quad W \geq 0,$$

which implies that $Y_{wh}(0) \geq Y_{wh}(\bar{W})$. For a tax-reducing coalition of owners of a widely held corporation, it is optimal to pay a zero wage to the active owner and instead pay all profits as dividends. For a closely held corporation, the kink introduces a slight complication:

¹⁰ It is possible to increase I_0 by increasing the capital stock of the corporation, as described in Alstadsæter (2007), but because the stock of capital is disregarded in this stylized model, that is not an issue here.

$$(9) \quad Y'_{ch}(W) = \begin{cases} (t_w - t_c) - t_p(1 - t_w), & \text{if } 0 \leq W \leq \widehat{W} \\ Y'_{wh}(W), & \text{if } W \geq \widehat{W} \end{cases}$$

The derivative for closely held corporations can be positive for $W \leq \widehat{W}$, which implies that $Y_{ch}(\widehat{W})$ is the maximum; otherwise $Y_{ch}(0)$ is the maximum.

After finding the income-shifting potential for each tax regime, we can then calculate the tax regime-shifting potential by comparing the maximum after-tax income across tax regimes. This is illustrated in Tables 1a and 1b, where net revenue (before taxes and wage payments to the active owner) is normalized to 100.

The columns under the heading $I_0=0$ in Table 1a lists the endpoints and kink-point for a corporation with $I_0=0$, which we can interpret as a single-person corporation without capital stock or employees. If this corporation is widely held and the owner's wage is set to zero, the after-tax income will be 72, while if it set to its highest possible value (\overline{W}), the after-tax income will be only 39.4. This means that the income-shifting potential is 32.6 under the widely held tax regime. Under the closely held tax regime, the income-shifting potential is 5.6; the difference between the maximum value 45.0, obtained when the owner's wage is zero, and the minimum value is 39.4, obtained when the owner's wage is at its

highest value (\overline{W}). The tax regime-shifting potential is thus 27.0, which is the difference between the maximum after-tax income under the widely held regime (72.0) and the maximum under the closely held regime (45.0).

The deductions due to imputed return to labor or salaries to employees other than the active owner, I_0 , play an important role, cf. equation (5). This can be seen from the columns under the heading $I_0=90$ in Table 1a, which can be interpreted as representing a corporation with large capital stock or with several employees. Under the widely held tax regime, the income-shifting potential is unaffected by this deduction, but under the closely held regime the income-shifting potential has increased to 29.9. The tax regime-shifting potential is correspondingly reduced to 2.7. In this case the income-shifting potential is large in both tax regimes, and the tax regime potential is very low. Similar results are found by Thoresen and Alstadsæter (2008).

The marginal tax rate on labor is reduced from 55 % to 35 % in Table 2. Again, the highest after-tax income is obtained when the active owner's wage is zero (part a). The incentives to participate in income-shifting or to shift tax regime are in general substantially reduced (part b). This is in accordance with prior expectations that it is the difference in the marginal tax rates on labor and capital that drives these tax-reducing activities. It can be demonstrated, by corresponding numerical examples, that reducing the payroll tax from 14.1 % to zero reduces the income-shifting

Table 1. Numerical examples, eq. (6) and (7) for owners in high tax brackets ($R=100, t_c=0.28, s=0.20, t_w=0.55, t_p=0.141$)

Part a: After tax income depending on compensation to active owner (W)					
W	π	$I_0=0$		$I_0=90$	
		$Y_{wh}(W)$	$Y_{ch}(W)$	$Y_{wh}(W)$	$Y_{ch}(W)$
0	100	72.0	45.0	72.0	69.3
\widehat{W}	*		44.3		69.2
\overline{W}	0		39.4		39.4

Part b: Income shift potential and tax regime shift potential				
	$I_0=0$		$I_0=90$	
	wh	ch	wh	ch
Inc. shift potential	32.6	5.6	32.6	29.9
Tax reg. shift potential		27.0		2.7

The relationship between wages and profits, and $\overline{W}=R/(1+t_p)=87.6$, follows from (2). From equation (7), it follows that $\widehat{W}=(R-I_0)/(1+t_p+s)$, which takes the values 74.6 and 7.5 for $I_0=0$ and $I_0=90$, respectively.

Table 2. Numerical examples, eq. (6) and (7) for owners in low tax brackets ($R=100$, $t_c=0.28$, $s=0.20$, $t_w=0.35$, $t_p=0.141$)

Part a: After tax income depending on compensation to active owner (\bar{W})					
W	π	$I_0=0$		$I_0=90$	
		$\bar{Y}_{wh}(W)$	$\bar{Y}_{ch}(W)$	$\bar{Y}_{wh}(W)$	$\bar{Y}_{ch}(W)$
0	100	72.0	45.0	72.0	69.3
\hat{W}	*		59.2		70.7
\bar{W}	0		57.0		57.0

Part b: Income shift potential and tax regime shift potential				
	$I_0=0$		$I_0=90$	
	wh	ch	wh	ch
Inc.shift potential	15.0	8.0	15.0	14.3
Tax reg.shift potential		7.0		0.7

and tax regime-shifting potential somewhat, but that the qualitative conclusions remain.

The results presented are obtained in a highly stylized model and should be interpreted accordingly. In more realistic situations it is likely that conflicts of interest may occur, say that wage payments to the active owner are considered costs by the passive owners, and dividend payments to passive owners are considered costs by the active owner.

3. Data

Our main data source is the Corporate Accounting Register, which covers all non-financial Norwegian corporations. This register provides detailed information on profits, equity, debt, number of employees, capital, production costs, dividend payments, region and sector. The second important source is the Tax Register, which provides information on imputed return to labor and enables us to identify whether corporations are widely or closely held.

Definitions of variables and descriptive statistics are given in Table 3. Our selected sample covers corporations founded in the years 1986–2002 and observed in the years 1993–2002. The analysis is restricted to include three of the sectors commonly believed to participate in tax-reducing activities: computers and related activities, other business activities, and health and social work.

The Profits variable is the log of corporations' taxable profits, after deduction for losses in previous years. Our focus is on corporations that

are in a tax position, so the population of interest is corporations with positive profits. This means that only observations of positive profits are included in the sample.

The sample is selected with respect to the variables of Assets and Labor. The purpose is to select relatively small corporations, which are generally believed to participate in the tax-reducing activities we are studying. For Assets, only observations with values between 100,000 and 15,000,000 NOK are included. The lower boundary for assets corresponds to the minimum required share capital for establishing a new corporation. For Labor, only observations with values between 1 and 15 are included. The lower boundary for labor excludes, for instance, subsidiary companies established to shield parent companies from liability. The upper bounds for both Assets and Labor are set to ensure that the models presented below are good approximations despite their relatively simple linear structure.

Observations with missing values for any of the variables were deleted. In the years 1993–1995, some corporations lacked identification numbers because of start-up difficulties for the official registers, and these were also deleted. This left us with a total sample of 64,670 corporations over a period of 10 years.

4. Empirical analysis and results

We have estimated two separate models, which we interpret in light of the discussion in Section 2. In the first model, we estimate the probability

Table 3. Descriptive statistics and definitions for variables

	Mean	Std.	Definition of variables
Profits	5.202	1.525	Log of profits
WH	0.518	0.500	Dummy for widely held
Assets	6.960	1.014	Log of asset value (in NOK)
Labor	0.951	0.791	Log of number of employees
Payroll-1	0.857	0.350	Dummy for payroll zone 1
Payroll-2	0.059	0.235	
Payroll-3	0.005	0.068	
Payroll-4	0.067	0.251	
Payroll-5	0.012	0.111	Dummy for payroll zone 5
Fy-1986	0.056	0.230	Dummy for foundation year 1986
Fy-1987	0.077	0.267	
Fy-1988	0.066	0.248	
Fy-1989	0.069	0.254	
Fy-1990	0.066	0.248	
Fy-1991	0.059	0.236	
Fy-1992	0.059	0.236	
Fy-1993	0.066	0.248	
Fy-1994	0.071	0.257	
Fy-1995	0.066	0.249	
Fy-1996	0.072	0.258	
Fy-1997	0.082	0.275	
Fy-1998	0.093	0.290	
Fy-1999	0.035	0.183	
Fy-2000	0.035	0.184	
Fy-2001	0.019	0.136	
Fy-2002	0.008	0.088	Dummy for foundation year 2002
Y-1993	0.049	0.216	Dummy for observation year 1993
Y-1994	0.051	0.221	
Y-1995	0.081	0.274	
Y-1996	0.086	0.280	
Y-1997	0.103	0.305	
Y-1998	0.119	0.323	
Y-1999	0.125	0.331	
Y-2000	0.126	0.332	
Y-2001	0.129	0.335	
Y-2002	0.130	0.337	Dummy for observation year 2002

All dummy variables have the value of one in an observation meets the required by the given definition; otherwise the value is zero. The variables Payroll-1, Fy-1986, and Y-1993 are used as reference categories, and excluded from the regressions. Profits and Assets are, before taking logs, measured in NOK 1000 and deflated using the consumer price index with 2002 as base year.

of being widely held as a function of a set of explanatory variables. In the second model, we estimate expected profit functions for each of the two tax regimes, subject to some auxiliary coefficient restrictions.

The discussion in Section 2 suggests that a corporation will *simultaneously* choose a tax regime and decide whether to partake in income shifting. In contrast, our two models are estimated completely independently, except that they share the same sample and variables. This may seem unsatisfactory, from a formal econometric point of view, and requires an explanation.

It is important to recognize that the population of all corporations is a subset of the population of all firms. After the 1992 tax reform, the tax rules for noncorporate firms to a large extent corresponded to the closely held tax regime for corporations. For firms founded prior to the reform, we would expect that some corporations opted out of the noncorporate organizational forms into the corporate form. We find it likely that such choices were partly tax motivated, and thus that there was a systematic selection of already established firms into the widely held tax regime for corporations.

However, our data do not cover the population of all firms, only the population of corporations, and our foundation year variable does not distinguish established non-corporate firms that change organizational form from genuinely new corporations. The situation is complicated further by the potential for high-salary individuals to quit as employees and start their own corporations under the widely held tax regime.

These issues make us reluctant to interpret our estimated models as structural. The model in Section 2, and the selection arguments above, suggest that choice of tax regime and level of profit will depend systematically on observable corporation characteristics.

4.1. Choice of tax regime

In Section 2 we showed that the tax regime shift potential is substantial for corporations with low

deductions ($I_0=0$), while it is small for corporations with high deductions ($I_0=90$). This suggests that corporations with low deductions will tend to choose the widely held tax regime more often than corporations with high deductions.

The deductions are not directly observable, but in general the deductions are increasing in both stock of real capital and number of employees. For this reason we use Assets and Labor as explanatory variables in a logit regression and interpret them as proxies for I_0 .

The econometric model is estimated using the xtlogit-routine in STATA 10, and is specified as follows:

$$(10) \quad P(D_{it}^{wh}) = \frac{\exp(x_{it}\beta + v_i)}{1 + \exp(x_{it}\beta + v_i)},$$

$$(11) \quad \text{where } v_i \sim iidN(0, \sigma_v^2).$$

Table 4. Logit regression for choice of tax regime, P(WH=1)

	Coef.	Std.err.	z
Assets	0.418	0.028	14.72
Labor	-0.302	0.036	-8.44
Payroll-2	-0.140	0.136	-1.03
Payroll-3	0.076	0.310	0.25
Payroll-4	-0.014	0.143	-0.09
Payroll-5	0.164	0.318	0.52
Fy-1987	-0.293	0.228	-1.28
Fy-1988	0.025	0.236	0.11
Fy-1989	0.209	0.233	0.90
Fy-1990	0.208	0.233	0.89
Fy-1991	0.659	0.237	2.78
Fy-1992	1.251	0.237	5.28
Fy-1993	1.236	0.231	5.36
Fy-1994	1.090	0.225	4.84
Fy-1995	0.990	0.226	4.39
Fy-1996	1.348	0.220	6.12
Fy-1997	1.269	0.212	5.98
Fy-1998	1.454	0.206	7.04
Fy-1999	1.753	0.241	7.27
Fy-2000	2.081	0.236	8.83
Fy-2001	0.921	0.264	3.50
Fy-2002	1.659	0.327	5.07
Y-1994	0.026	0.087	0.30
Y-1995	0.381	0.082	4.65
Y-1996	0.421	0.082	5.16
Y-1997	0.928	0.081	11.47
Y-1998	1.187	0.081	14.73
Y-1999	1.222	0.081	15.09
Y-2000	-0.269	0.081	-3.30
Y-2001	-0.234	0.082	-2.85
Y-2002	-0.394	0.084	-4.69
Const	-3.354	0.260	-12.89
σ_v	4.050	0.060	

Here D_{it}^{wh} , equal to either zero or one, denotes the observed choice of tax regime for corporation i in observation year t . The regression part consists of a vector of observable regressors, x_{it} , a vector of coefficients, β , and a corporation specific unobserved effect, v_i . The full list of regressors is presented in Table 4. The corporation-specific effects capture unobserved time-invariant variables that affect a specific corporation's choice of tax regime, and are assumed to be normally distributed and stochastically independent of the observable regressors.

The Assets variable is positively related to the probability of being widely held. If corporations only considered tax motives, this would be the opposite of our predictions: an increasing value of Assets is associated with higher values of deductions, and hence, a reduced tax benefit of choosing the widely held regime. We should keep in mind that the corporations in need of external capital will also tend to choose the widely held regime. We present results in the next section that support the tax motivation explanation.

The Labor variable is negatively related to the probability of being widely held. This is consistent with predictions based on tax motives: a higher number of employees means higher deductions because of salary payments, and higher deductions means lower incentives to choose the widely held tax regime.

For the foundation year dummies, the results suggest that corporations founded prior to the reform (FY-1987–FY-1991) to a lesser degree chose the widely held tax regime, compared with those founded after the reform: all coefficients for the foundation year dummies after the reform (FY-1992–FY-2002) have positive and substantial values that are statistically significant, while foundation years prior to the reform tend to have lower numerical values and be statistically insignificant.

The estimated value for the corporate specific effects, $\sigma_v = 4.050$, is large and implies that unobserved corporation specific effects have a strong influence. It is also consistent with the fact that corporations tend to remain under the same tax regime for several consecutive years. The payroll zone dummies are generally insignificant, which is consistent with predictions from the discussion

in Section 2. The probability of choosing the widely held regime tends to be gradually increasing with a peak in 1999, as can be seen from the coefficients for the observation year dummies.

4.2. Income shifting

In Section 2 we found that the income-shifting potential depends on the level of deductions and the chosen tax regime. The income shifting we have discussed involves reducing wage compensation to the active owners and thereby increasing profits.

We argued that the income-shifting potential varies systematically between the tax regimes, and hence, we expect profits to vary systematically between tax regimes for *observationally equal corporations*. To be specific, we expect the average profits, conditional on a set of observable variables, will be higher under the widely held regime than under the closely held regime.

We start by defining a function for average profits for each tax regime,

$$(12) \quad \pi_{wh} = \sum_{j=0}^J a_j x_j \quad \text{and} \quad \pi_{ch} = \sum_{j=0}^J b_j x_j ,$$

where the x_j 's are observable variables, and the a_j 's and b_j 's are the corresponding coefficients. It follows that the difference between these two functions is given by

$$(13) \quad \pi_{wh} - \pi_{ch} = \sum_{j=0}^J (a_j - b_j) x_j .$$

It is this difference in profits that is of our interest, and we present estimates of both the level and the $(a_j - b_j)$ -coefficients.

In the estimation we use a specification where the two profit functions from equation (12) are estimated simultaneously and where the $(a_j - b_j)$ -coefficients from equation (13) can be obtained directly:

$$(14) \quad \pi_i = \sum_{j=0}^J b_j x_{ji} + \sum_{j=0}^J (a_j - b_j) x_{ji} D_i^{wh} ,$$

where $D_i^{wh} = 1$ if the widely held regime was chosen for observation i , and zero otherwise. We do not include unobserved corporate specific effects because their interpretation is not clear in

Table 5. OLS regression for log profits

	bj 's				(aj - bj) 's		
	Coef	St.err	z		Coef	St.err	z
Const	-2.199	0.060	-36.45	WH	0.462	0.086	5.35
Assets	1.044	0.008	137.65	WH*Assets	-0.026	0.010	-2.55
Labor	-0.139	0.010	-14.36	WH*Labor	-0.053	0.013	-4.01
Payroll2	-0.173	0.028	-6.25	WH*Payroll2	-0.077	0.039	-2.00
Payroll3	-0.212	0.097	-2.18	WH*Payroll3	-0.145	0.133	-1.09
Payroll4	-0.200	0.026	-7.75	WH*Payroll4	-0.016	0.036	-0.44
Payroll5	-0.482	0.059	-8.11	WH*Payroll5	0.070	0.082	0.86
Fy1987	0.055	0.033	1.66	WH*Fy1987	-0.031	0.050	-0.60
Fy1988	0.073	0.035	2.09	WH*Fy1988	-0.085	0.052	-1.63
Fy1989	0.088	0.035	2.53	WH*Fy1989	-0.066	0.051	-1.28
Fy1990	0.095	0.035	2.72	WH*Fy1990	-0.056	0.052	-1.09
Fy1991	0.096	0.037	2.60	WH*Fy1991	-0.045	0.053	-0.85
Fy1992	0.008	0.038	0.21	WH*Fy1992	0.096	0.053	1.80
Fy1993	0.131	0.037	3.52	WH*Fy1993	0.019	0.052	0.35
Fy1994	0.115	0.036	3.18	WH*Fy1994	0.023	0.052	0.45
Fy1995	0.102	0.037	2.77	WH*Fy1995	0.079	0.052	1.51
Fy1996	0.144	0.037	3.87	WH*Fy1996	0.035	0.052	0.66
Fy1997	0.100	0.036	2.77	WH*Fy1997	0.094	0.051	1.84
Fy1998	0.242	0.036	6.81	WH*Fy1998	0.118	0.050	2.35
Fy1999	0.110	0.046	2.38	WH*Fy1999	0.135	0.064	2.12
Fy2000	0.073	0.047	1.56	WH*Fy2000	0.135	0.064	2.10
Fy2001	0.064	0.054	1.18	WH*Fy2001	0.028	0.079	0.35
Fy2002	-0.058	0.082	-0.71	WH*Fy2002	0.286	0.113	2.54
Y1994	-0.065	0.038	-1.72	WH*Y1994	0.020	0.057	0.35
Y1995	0.004	0.035	0.11	WH*Y1995	-0.023	0.052	-0.43
Y1996	0.046	0.035	1.31	WH*Y1996	-0.020	0.052	-0.39
Y1997	0.148	0.035	4.22	WH*Y1997	-0.102	0.051	-2.01
Y1998	0.202	0.035	5.75	WH*Y1998	-0.084	0.050	-1.66
Y1999	0.139	0.035	3.95	WH*Y1999	-0.059	0.050	-1.17
Y2000	0.224	0.034	6.61	WH*Y2000	-0.311	0.050	-6.17
Y2001	0.210	0.034	6.16	WH*Y2001	-0.364	0.051	-7.19
Y2002	0.249	0.034	7.25	WH*Y2002	-0.341	0.051	-6.65

this case. The model is estimated by ordinary least squares, treating the whole sample as a cross section.

Results for the estimation of equation (14) are given in Table 5. The left-hand side contains estimates of the b_j 's, while the right-hand side contains estimates of the $(a_j - b_j)$'s.

The $(a_j - b_j)$ -coefficients for Assets and Labor are -0.026 and -0.053 , respectively, which implies that the average value of Profits is declining in each of these variables. Because the deductions are increasing in each of the two variables, the incentive for income shifting is decreasing, consistent with tax-reducing behavior.

The results in Table 5 can be used to obtain an estimate of the difference in Profits. Let the subscripts $j=0$, $j=1$, and $j=2$ indicate the constant terms, the coefficients of Assets, and the coefficients of Labor, respectively. If we disregard

all other terms (i.e., we are considering the reference group), we can write the predicted difference in profits as

$$(15) \quad k = \widehat{\pi}_{wh} - \widehat{\pi}_{ch}$$

$$= (\widehat{a_0} - \widehat{b_0}) + (\widehat{a_1} - \widehat{b_1}) \cdot Assets + (\widehat{a_2} - \widehat{b_2}) \cdot Labor$$

$$= 0.462 - 0.026 \cdot Assets - 0.053 \cdot Labor .$$

The graph of this expression is presented in Figure 1.

Figure 1 shows a pattern that is consistent with income-shifting behavior. The difference in profits is at its highest when the deductions are the lowest, $(Assets, Labor) = (0, 4.6)$, and decreasing in both variables. Thus, it may seem

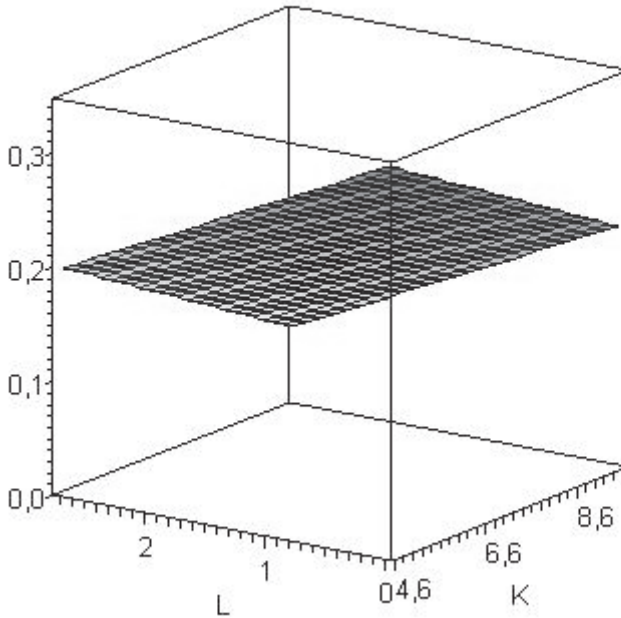


Figure 1. Predicted difference in Profits as function of Assets (K) and Labor (L)
 Note: The predictions are based on equations (15–17) and coefficients reported in Table 5, for a corporation that has Payroll-1=1, Fy-1986=1, and Y-1993=1.

that small business owners, who have the most to gain from being widely held and participating in income shifting, have in fact adapted their ownership structures and escaped the split model. The owners of corporations with many employees and high value of capital have high deductions when calculating the imputed return to the labor effort of the active owners under the split model, and these corporations thus have smaller incentives to adapt their ownership structure to escape the split model. As we see in Figure 1, the difference in profits between the widely held and closely held corporations in this group is much smaller, indicating that there is less to gain from shifting tax regime for this group, as we would expect.

A relevant question is whether the estimated difference seems reasonable and is large enough to matter. Taking the anti-log of k and rearranging the first line in equation (15) yields

$$\hat{\Pi}_{wh} = e^k \cdot \hat{\Pi}_{ch},$$

where $\hat{\Pi}$ denote profits measured in (deflated) NOK. For a numerical example, consider a “Consultant” with Asset = 4.606 and Labor = 0. Inserting into equation (15) yields

$$k = 0.342 \Leftrightarrow e^k = 1.41,$$

meaning that profits for widely held corporations are approximately 41 % higher than profits for closely held corporations.¹¹

When Assets and Labor are at the highest values allowed by the sample selection rules, similar calculations yield that $e^k=1.07$, and when Asset and Labor are at their sample averages, $e^k=1.26$.

¹¹ We remind the reader that only observations with positive profits are included in the sample.

5. Conclusion

We observe adaptations to the existing Norwegian dual income tax system over a period of time, and can analyze this without information on all factors included in the individual's decision process. We have access to the same information as the tax authorities, and do not attempt to set up a structural model to describe the decision process within the firm. We describe the ex ante incentives for tax-minimizing income shifting in a theoretical setting, and observe the ex post outcome of the decision process within the "black box" of the firm.

We find that corporations have adapted to the tax system in manners that are consistent with tax-reducing behavior. Typically, the widely held corporations have higher profits than corresponding closely held corporations. Small business owners who have the most to gain from this change in ownership structure – those with the higher profits and low deductions for the return to capital and labor effort of employees under the split model – are in fact those who have adapted their ownership structure to escape the split model.

We also find that corporations founded prior to the 1992 tax reform differ systematically from corporations founded after the reform. One explanation is that new corporations are more flexible and better able to form tax-reducing coalitions, compared with existing prereform corporations. Another explanation is that there is a systematic selection of existing noncorporate firms: those firms that have incentives, and are able to form tax-reducing coalitions, may more often be inclined to choose the widely held regime and participate in income shifting.

Two methods exist to prevent this income shifting from the personal to the capital income tax base under a dual income tax. The first is a kind of imputation system to split the income in a small business into a return to the active owners' labor effort and a return to the invested capital. This was the path chosen for corporations in Norway in the period 1992–2005, and in different versions in Sweden and Finland, as described in detail by Lindhe et al. (2004). A second method is the introduction of a double taxation of dividends. This is the route most recently

taken by Finland in 2005 (see Kari, Karikallio and Pirttilä (2008, 2009)), and by Norway in 2006 (see Sørensen (2005) and Alstadsæter and Fjærli (2009)). The introduction of the 2006 Norwegian Shareholder model is an ambitious attempt to introduce a neutral tax on shareholder income under a dual income tax. It taxes dividend income while allowing a deduction for the "normal" return to the share. Future evaluations will show whether this reform reached its goal of eliminating income shifting in corporations.

References

- Alstadsæter, A. (2007).** "The Achilles Heel of the Dual Income Tax – The Norwegian Case." *Finnish Economic Papers* 20, 5–22.
- Alstadsæter, A., and E. Fjærli (2009).** "Neutral Taxation of Shareholder Income? Corporate Responses to an Announced Dividend Tax." *International Tax and Public Finance* 16, 571–604.
- Ayers, B., B. Cloyd, and J. Robinson (1996).** "Organizational Form and Taxes: An Empirical Analysis of Small Businesses." *Journal of the American Taxation Association* 18 (supplement), 49–67.
- Crawford, C., and J. Freedman (2010).** "Small Business Taxation." In *The Mirrlees Review. Dimensions of Tax Design*. Forthcoming. Oxford University Press.
- de Mooij, R.A., and G. Nicodème (2008).** "Corporate Tax Policy and Incorporation in the EU." *International Tax and Public Finance* 15, 478–498.
- Egger, P., C. Keuschnigg, and H. Winner (2009).** Incorporation and Taxation: Theory and Firm-Level Evidence. CESifo Working Paper No. 2685, Munich.
- Fjærli, E., and D. Lund (2001).** "The Choice between Owner's Wages and Dividends under the Dual Income Tax." *Finnish Economic Papers* 14, 104–119.
- Gentry, W. (1994).** "Taxes, Financial Decisions and Organizational Form. Evidence from Publicly Traded Partnerships." *Journal of Public Economics* 53, 223–244.
- Goolsbee, A. (1998).** "Taxes, Organizational Form, and the Deadweight Loss of the Corporate Income Tax." *Journal of Public Economics* 69, 143–152.
- Goolsbee, A. (2004).** "The Impact of the Corporate Income Tax: Evidence from State Organizational Form Data." *Journal of Public Economics* 88, 2283–2299.
- Gordon, R., and J. MacKie-Mason (1994).** "Tax Distortions to the Choice of Organizational Form." *Journal of Public Economics* 55, 279–306.
- Gordon, R., and J. Slemrod (2000).** "Are 'Real' Responses to Taxes Simply Income Shifting Between Corporate and Personal Tax Base?" In *Does Atlas Shrug? The Economic Consequences of Taxing the Rich*. Eds. J. Slem-

- rod. Russel Sage Foundation. Cambridge and London: Harvard University Press, 240–288.
- Griffith, R., J. Hines, and P.B. Sørensen (2010).** “International Capital Taxation.” In *The Mirrlees Review. Dimensions of Tax Design*. Forthcoming. Oxford University Press.
- Hagen, K.P., and P.B. Sørensen (1998).** “Taxation of Income From Small Businesses: Taxation Principles and Tax Reforms in the Nordic Countries.” In *Tax Policy in the Nordic Countries*. Eds. P.B. Sørensen. London: Macmillan, 28–71.
- Hietala, H., and S. Kari (2006).** “Investment Incentives in Closely Held Corporations and Finland’s 2005 Tax Reform.” *Finnish Economic Papers* 19, 41–57.
- Kari, S., H. Karikallio, and J. Pirttilä (2008).** “Anticipating Tax Changes: Evidence from the Finnish Corporate Income Tax Reform of 2005.” *Fiscal Studies* 29, 167–196.
- Kari, S., H. Karikallio, and J. Pirttilä (2009).** The Impact of Dividend Taxation on Dividends and Investment: New Evidence Based on a Natural Experiment. CESifo Working Paper No. 2756, Munich.
- Lindhe, T., J. Södersten, and A. Oberg (2004).** “Economic Effects of Taxing Different Organizational Forms under the Nordic Dual Income Tax.” *International Tax and Public Finance* 11, 469–485.
- MacKie-Mason, J., and R. Gordon (1997).** “How Much do Taxes Discourage Incorporation?” *Journal of Finance* 52, 47–505.
- Romanov, D. (2006).** “The Corporation as a Tax Shelter: Evidence From Recent Israeli Tax Changes.” *Journal of Public Economics* 90, 1939–1954.
- Sørensen, P.B. (1994).** “From the Global Income Tax to the Dual Income Tax. Recent Tax Reforms in the Nordic Countries.” *International Tax and Public Finance* 1, 57–79.
- Sørensen, P.B. (2005).** “Neutral Taxation of Shareholder Income.” *International Tax and Public Finance* 12, 777–801.
- Thoresen, T.O., and A. Alstadsæter (2008).** Shifts in Organizational Form under a Dual Income Tax System. CESifo Working Paper No. 2273, Munich.