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Economic Effects of Taxing Different Organizational Forms under a Dual Income Tax ^a

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Abstract

This paper analyzes the economic effects of different income splitting rules for closely held corporations and sole proprietorships/partnerships in a tax system with a dual income tax. We conclude that the tax rules for closed corporations offer roughly the same cost of capital as for widely held corporations. Compared to corporate firms, the cost of capital is lower for sole proprietorships/partnerships, because the income-splitting rules both neutralize the impact of the high labor income tax and avoid the two-tier taxation on the corporate form of organization. Adding risk to the model shows that closely held corporations have a lower cost of capital than would be the case without income-splitting rules.

^a The views expressed in the paper do not necessarily reflect those of the Swedish Ministry of Finance or the National Institute of Economic Research.

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1 Introduction

In Harberger's (1962) seminal article on tax incidence, the corporate profits tax was seen as reducing the rate of return on corporate assets and inducing a shift of capital from the corporate to the non-corporate sector to equalize the post-tax rates of return. The corporate or non-corporate status of firms was predominantly determined by non-tax factors, so that certain industries were necessarily corporate and others necessarily non-corporate. Though King (1975) and others have demonstrated that alternative assumptions on the "special provisions" of the corporate tax code (allowances for depreciation of real assets and for deduction of the cost of funds) may modify this early view of tax distortion, the principal focus in much of past work on corporate taxation has been implications for real investment behavior.

During the last decade policy makers and researchers have also focused on the possibilities of *income shifting* as one additional concern for the design of the business tax code (see for example Gordon and Slemrod (1998)). Firms may respond to tax incentives not only by changing real investment, but also by changing their form of organization – that is from corporate to non-corporate status - or by altering the form of compensation to shareholders, managers and other key employees. Though tax distortions to real investment may be a concern for all types of businesses, tax avoidance through the shifting of income between the personal and the corporate tax bases, is a practice mostly undertaken by small firms. Small firms may be organized as *closely held corporations*, as *partnerships* or as *sole proprietorships*, and apart from the tax treatment these legal forms are to a large extent close substitutes.

The tax legislators often face a difficult dilemma in designing tax rules for small businesses, since the more effectively tax motivated income shifting is combated, the greater are the risks of worsened incentives for real investment and business expansion. The Nordic countries provide clear and interesting examples of attempts to escape this dilemma by enacting various rules of income splitting. An important part of the problem, and the immediate reason for the introduction of special tax rules, is the switch from the global income tax to the Nordic dual income tax in the beginning of the 1990's – where capital income is taxed at a lower rate than the top marginal tax rate on labor income. In addition, the preferential tax treatment of capital income is reinforced because of the fact that social security taxes are levied only on labor income. Thus, the taxpayer's total tax bill depends not only on his total income, but also on his income division. This has created new room for tax

avoidance, especially for owners of small business firms who are able to lower tax payments by transforming labor income subject to a high marginal tax rate into capital income subject to low tax rate.

To combat tax motivated income shifting in small business firms, the Nordic governments have introduced alternative methods of income splitting, known in the taxation literature as the *fence model* and the *source model* (see Hagen and Sørensen (1998) for a full discussion). The fence model attempts to separate (and tax differently) income retained within the business, from income withdrawn for private purposes, whereas the source model splits business earnings into income from capital and income from labor. The two methods have also been combined in various ways, depending on the form of organization

The purpose of this article is to analyze the income splitting rules for closed corporations and partnerships/sole proprietorships and determine their impact on the cost of capital. The analysis is confined to Swedish tax rules, but the results easily carry over to the rules of the other Nordic countries. Moreover, we compare the effects of the special rules on risk-taking, making use of the simple portfolio model developed in Apel and Södersten (1999). The paper draws on Kari (1999) and Lindhe, Södersten and Öberg (2002), who studied the economic effects of the tax treatment of closed corporations in the Nordic countries, and extends Hagen and Sørensen's (1998) penetrating but largely general and verbal analysis of the problem of taxing small businesses.

We conclude that the Swedish tax rules for closed corporations offer roughly the same cost of capital as for widely held corporations. Compared to corporate firms the cost of capital is lower for sole proprietorships/partnerships, and the reason for this is that the special tax rules for sole proprietorships/partnerships both neutralize the impact of the high labor income tax and avoid the two-tier taxation on the corporate form of organization. Adding risk to the model shows that the special income splitting rules of closely held corporations reduce the cost of capital compared to a hypothetical situation without such rules.

After this introduction, section 2 highlights the tax treatment of different organizational forms. Section 3 contains a simple model deriving the cost of capital under certainty, while section 4 extends the analysis by incorporating risk. Section 5 concludes.

2 Tax treatment of different organizational forms

This section briefly describes the tax code for corporate and non-corporate firms in Sweden. A summary of the different tax parameters in 2003 is presented in table 1 at the end of the section.

Corporate firms: Widely and closely held corporations

Widely held corporations (WHC) – defined as corporate businesses with many non-active owners - and closely held corporations (CHC) - defined as corporate businesses with one or a few active owners – are both legal persons and taxable entities.

Corporate taxation in Sweden follows the classical system (with a minor exception for the partial double tax relief for unquoted firms). Business income is taxed at the corporate level as it arises, and at the personal level upon distribution. WHC and CHC, as well as the non-corporate firms mentioned below, are allowed accelerated depreciation of the capital stock. Further, also applying to all organizational forms, the tax rules allow some income averaging through tax-free allocations to a periodical reserve. We have excluded these features in the analysis to focus on the economic effects of the income splitting rules.

The tax code for CHC requires dividend income to be split into capital and labor income. Dividends are taxed as capital income only when equal to or less than an imputed return on the acquisition price of the shares.¹ If actual dividends exceed the level so defined (*normal dividends*), the difference (*excess dividends*) is taxed as labor income. The rules for taxing capital gains on the shares of CHC state in principle that half of the calculated gain is to be treated as labor income, and the other half as capital income.²

Non-corporate firms: Sole proprietorships and partnerships

All income from a sole proprietorship (SP) is attributed to the proprietor and taxed in his hands, i.e. the SP is neither a legal person of its own, nor a taxable entity. The rules for taxing income from SP carry over with only slight modifications to partnerships. To mitigate the impact of the labor income tax, two different modes of income division have been introduced. While the income-splitting rule for CHC is mandatory, the division rules for SP are optional.

¹ The imputed return is set equal to the interest rate on 10-year government bonds plus a "risk premium" of five percentage points.

² There are other special rules as well – the most important being the possibility to save unused normal dividends for later years. For a more detailed description of the rules, see Lindhe, Södersten and Öberg (2002).

The first income-splitting scheme is the so-called *positive interest distribution*, determined by imputing a return to net business assets.³ The imputed return is taxed as personal capital income. The second scheme allows income retained within the business, as a so-called *expansion fund*, to be taxed at a rate equal to the corporate tax rate. The two modes of income-splitting available to the SP may be used simultaneously, and residual income – net of the annual allocation to the expansion fund and interest distribution – is taxed as income from labor. It should be noted, however, that the two schemes are not additive, since amount allocated to the expansion fund will reduce the base used to calculate the positive interest distribution.

There is a conceptually important distinction between the two modes of income splitting. Interest distribution is an application of the source model, which splits the business income of the SP into income from capital and income from labor. Allocations to the expansion fund, on the other hand, accords with the fence model, which attempts to tax differently income retained within the firm from income used for private purposes.

³ The imputed rate of return equals the interest rate on ten-year government bonds plus a premium of five percentage points. If the proprietor chooses the positive interest distribution to be less than the imputed return on net business assets, an amount equal to the difference may be taken out as capital income in a later year. The Swedish scheme requires an “interest correction”, or a so-called *negative interest distribution*, when the registered net assets of the business turn negative. The negative interest distribution was introduced after the tax reform of 1991 to prevent the proprietor from transferring private debt into his firm. Such a transfer would substantially increase the tax value of deducting interest on private debt.

Summary of tax parameters

A summary of the different tax parameters discussed above is presented in table 1 below.

Table 1. Summary of tax parameters in Sweden 2003.

Percent

Item	Parameters / Definitions	WHC / CHC	SP / Partnership
Statutory rate of corporation tax	t	28	-
Personal tax on capital income (dividend, interest)	t_{pi}	30	30
Personal tax on <i>realized</i> capital gain ¹	t_{pc} or t_{pc}^w	30 or 43.5	-
Tax rate on expansion fund	t	-	28
Labor income tax ²	t_{pw}	57	57
General payroll tax	p	32.82	32.82
Imputed rate of positive capital income ³	r	10.06	10.06
<i>Total tax on income from corporate capital</i>	$t + (1-t)t_{pi}$	49.6	-
<i>Total tax on labor income</i>	$(p + t_{pw}) / (1 + p)$	67.6	67.6

Notes

WHC is a widely held corporation, CHC a closely held corporation, SP a sole proprietorship.

¹ In the model the parameters t_{pc} and $t_{pc}^w (= 0.5t_{pw} + 0.5t_{pc})$ represent the effective tax rates on *accrued* capital gains in WHC and CHC.

² The labor income tax consists of a national tax rate (set to 25 percent, for income exceeding 374 000 SEK) and a local tax rate on labor income (set to 32 percent on average).

³ Equal to the interest rate on ten-year government bonds plus a premium of five percentage points.

It is clear from table 1 that the owner of a CHC faces strong tax incentives to transform labor income (total tax of 67,6 %) into capital income (49,6 %), and these incentives clearly motivate the introduction of the special rules for income splitting. In the case of SP (and partnerships) income splitting rather serves the purpose of mitigating the negative impact of the labor income tax on business incentives.

3 The model

This section derives the cost of capital for the three different organizational forms: WHC, CHC and SP. To make the analysis simple, we consider a single investment project of unit value and we ignore depreciation (as well as other aspects of the tax code with little impact on

the problems considered here). Besides organizational form, the firm's cost of capital will also depend on the source of finance, and we will consider both equity and debt.

Widely held corporations (WHC)

We let the statutory corporate tax rate be t , and we assume that the return from the investment net of corporate tax is distributed to the owners as dividends. Dividends are taxed as capital income at the rate t_{pi} , while t_{pc} is the tax on (accruing) capital gains. With k denoting the owners' after-tax rate of return requirement, the minimum pre-tax rate of return on the marginal investment, p , must satisfy the condition

$$kq = p(1-t)(1-t_{pi}), \quad (1)$$

where the right hand side is the dividend net of tax and q , on the right hand side, is the market valuation of the owners' investment in the project. When the investment project is financed by an issue of new equity, $q = 1$, and we find from (1) that

$$p = \frac{k}{(1-t)(1-t_{pi})}, \quad (2)$$

which is the cost of capital of a WHC with new equity as the marginal source of funds.

Turning next to the case where the investment is financed through retained earnings, i.e. a reduction in dividends, the well-known result of the *new view of equity* (cf. Auerbach (1979) and Sinn (1987)) holds that $q = (1-t_{pi})/(1-t_{pc})$. We then derive from (1)

$$p = \frac{k}{(1-t)(1-t_{pc})}. \quad (3)$$

Finally, with debt as the marginal source of funds and i as the market rate of interest, we find that $p = i$, that is, the cost of capital is independent of tax. The obvious reason for this is that debt interest is deductible against the base of the corporate income tax.

Closely held corporations (CHC)

The sole owner of a CHC can withdraw business income from his firm both as dividends and as wages. The amount of wage income is not contingent on the effort put into the firm by the owner, but is instead determined as a result of the owner's tax planning activity, which we analyze below. Wages are deductible against the base of corporate income tax but are subject to a firm-level pay-roll tax at the rate p . The total tax paid by the owner on a unit of business income withdrawn as wage income is hence $(p + t_{pw})/(1 + p)$, where t_{pw} is the personal income tax rate, leaving $(1 - t_{pw})/(1 + p)$ net of tax. Income distributed as dividends (D) may be taxed at two different rates in the hands of the owner. *Normal dividends* (D^N), not exceeding the imputed return (to be defined below), are taxed at the personal capital income tax rate t_{pi} , whereas *excess dividends* ($D - D^N$) are taxed as labor income at the rate t_{pw} , where $t_{pw} > t_{pi}$. The net-of-tax income from a unit of pre-tax business income paid as normal dividends is therefore $(1 - t)(1 - t_{pi})$, compared to $(1 - t)(1 - t_{pw})$ for excess dividends. From the description of the Swedish tax system in section 2, we find that

$$(1 - t)(1 - t_{pi}) > \frac{1 - t_{pw}}{1 + p} > (1 - t)(1 - t_{pw}), \quad (4)$$

which means that normal dividends dominate wage income which in turn dominates excess dividends as channels of withdrawing income from the CHC. Since the tax code does not impose any limitation on the amount withdrawn as wage income, (4) implies that the corporation will never make use of excess dividends as a method of distributing earnings. The owner's cash income from his firm, net of all taxes is then

$$C = (1 - t)(1 - t_{pi}) \frac{D^N}{1 - t} + \left(\frac{1 - t_{pw}}{1 + p} \right) W, \quad (5)$$

where $D^N/(1 - t)$ is the before-tax income behind the normal dividend, and W is the owner's wage income. The tax code puts an upper limit to the amount taxed as income from capital by requiring that normal dividends be no higher than a presumptive rate of return times the sum

of the acquisition cost of the CHC's shares and the presumptive return from past years not withdrawn as normal dividends, i.e.

$$D^N \leq r(A+U). \quad (6)$$

The parameter r is the presumptive rate of return, A is the acquisition cost of the shares of the CHC and U is the presumptive return from past years not withdrawn as normal dividends. Given that normal dividends are tax-preferred to wage income (see condition (4)) constraint (6) will clearly bind with $U = 0$, i.e. whenever a CHC uses wage income as a channel to distribute business income to its owner.⁴

We next turn to examining the effects of the special dividend taxation rules for the CHC's cost of capital. As before, we assume that the CHC undertakes a new investment of unit value, and that the pre-tax return from the project, p , is distributed to the owner as normal dividends and wage income. We first consider the case where the investment is financed by a new issue of equity, adding one unit to the acquisition cost of the CHC's shares. With k as the after-tax rate of return required by the owner of the CHC on the market value of his marginal investment, denoted as q , the pre-tax return p must satisfy the condition

$$kq = \frac{r}{1-t} (1-t)(1-t_{pi}) + \left(p - \frac{r}{1-t} \right) \left(\frac{1-t_{pw}}{1+p} \right), \quad (7)$$

where the before-tax profit behind the normal dividend (cf. expression (5)), $r/(1-t)$, is taxed as income from capital and the residual, $p - r/(1-t)$, as income from labor. With new equity as the marginal source of funds, $q = 1$. Rearranging (7), then gives the cost of capital for the CHC as

$$p = \frac{k}{(1-t)(1-t_{pi})} + \left(\frac{k}{1-t_{pi}} - r \right) \left(\frac{(1-t)(1-t_{pi}) - \frac{1-t_{pw}}{1+p}}{\frac{(1-t)(1-t_{pw})}{1+p}} \right). \quad (8)$$

⁴ Despite the apparent tax disadvantage, the owner of the CHC may want to withdraw wage income sufficient to make maximum use of future social security benefits linked to current wage earnings. This complication is ignored in the following.

Hence, provided that the presumptive rate of return is set equal to the owner's required rate of return before personal tax, i.e. $r = k/(1 - t_{pi})$, the cost of capital for a CHC is the same as for a WHC.

Deriving the cost of capital for CHC with retained earnings as the marginal source of funds is somewhat more complicated. A new investment financed by retained earnings does not add to the acquisition cost of the CHC's shares, and the effect of this is that gross return p from the investment is fully taxed as wage income. For the marginal investment, the pre-tax return p must then satisfy

$$kq = p \left(\frac{1 - t_{pw}}{1 + p} \right). \quad (9)$$

To determine q , i.e. the value to the investor of the marginal investment, we note that the CHC could retain additional funds for investment by cutting either normal dividends or the payment of wage income to the owner. From the pecking order implied by the inequalities in (4), we find that the tax-preferred method of retaining earnings is to reduce wage payments. To finance an investment of unit value the cut in wage payments must be sufficient to increase the CHC's before-tax profits by $1/(1 - t)$. Had this amount instead been distributed as labor income, the owner would have received $[1/(1 - t)][(1 - t_{pw})/(1 + p)]$, net of tax. With t_{pc}^w as the (accruals) rate of capital gains tax, the capital gain (or market value of the marginal investment) q required to compensate the owner for this foregone wage income is obtained from

$$q(1 - t_{pc}^w) = \left(\frac{1}{1 - t} \right) \left(\frac{1 - t_{pw}}{1 + p} \right). \quad (10)$$

Eliminating q from (9) by using (10), we derive

$$p = \frac{k}{(1 - t)(1 - t_{pc}^w)}, \quad (11)$$

which is the CHC's cost of capital with retained earnings (i.e. reduced wage income) as the marginal source of funds. We note that neither the personal taxes on dividends and wage income, nor the special rules for determining the size of normal dividends (e.g. the presumptive return parameter r) matter. Though this result may seem surprising, it is an exact parallel to the familiar finding of the *new view of equity*, that the cost of capital (for a WHC) with retained earnings as the marginal source of funds is independent of the tax on dividends (see equation (3)). Expression (11) implies that the CHC is in a "trapped equity" regime, where a (possible) high rate of tax on the marginal source of income (owner's wages) not only means that the after-tax amount remaining from one unit of pre-tax business income is small, but also that the opportunity cost of retaining funds for new investment in the firm is equally low. Note that (11) differs from the cost of capital of a WHC only to the extent that the effective capital gains tax rate t_{pc}^w is higher because of the special rules that apply when selling shares in a CHC (see table 1).

Finally, with debt finance, the cost of capital is the market interest rate, i.e. $p = i$, since the special rules for CHC only affect the cost of equity.

Sole proprietorships (SP)

The sole proprietor's cash flow from his firm, net of tax and outlays for investment and debt service, may be written as

$$Q = F(K, L) - iB + \dot{B} - S - I, \quad (12)$$

where $F(\cdot)$ is the output of the firm, iB is the interest payment and $\dot{B} \equiv dB/dt$ is the flow of net borrowing. I is real investment and S is the tax bill, defined as

$$S = \left(\frac{t_{pw} + p}{1 + p} \right) (F(K, L) - iB - R) + t^i R. \quad (13)$$

Equation (13) means that taxable income is split into two parts. An amount R is taxed at the rate t^i , whereas the residual income is taxed as earned income. As explained, the tax on earned income depends on both the income tax rate t_{pw} and on the rate of payroll tax, p . Moreover, there are two alternative modes of income splitting available to the SP. By electing

interest distribution, R will be taxed as personal capital income, that is $t^i = t_{pi}$. If the SP instead chooses to allocate money to the *expansion fund*, R is taxed at the corporate tax rate, that is $t^i = t$.

While both modes of income splitting may be used simultaneously, the accumulated amount of funds allocated to the expansion fund limits the scope for interest distributions. To see this, note that the accumulated amount of income allocated to the expansion fund net of tax may not exceed the net worth of the firm

$$E(1-t) \leq K - B, \quad (14)$$

whereas the annual amount of interest distribution is limited to

$$R^{\text{int}} \leq r(K - B - (1-t)E). \quad (15)$$

Clearly, when (14) binds, interest distribution as a mode of income splitting is ruled out. Constraint (14) further implies that

$$\dot{E} \leq \frac{\dot{K} - \dot{B}}{1-t}, \quad (16)$$

and therefore

$$R^{\text{exp}} \equiv \dot{E} \leq \frac{\dot{K} - \dot{B}}{1-t}. \quad (17)$$

We find from the above that the income splitting saves tax on earned income at the rate $(t_{pw} + p)/(1+p)$, but also requires an extra tax payment of $t^i R \equiv tR^{\text{exp}} + t_{pi}R^{\text{int}}$. The relative weight of the tax rates t and t_{pi} for this extra tax payment hence depends on the extent to which the SP makes use of allocations to his expansion fund or of interest distributions.

As mentioned in section 2 there is a conceptual distinction between the expansion fund (related to the fence model) and interest distribution (related to the source model) as methods of income splitting. There is also a technical difference between these modes that relates to

timing. Claiming interest distribution allows the SP a definite tax break, equal to the difference between the tax on earned income and the personal tax on capital income, whereas allocation to the expansion fund brings about a deferral of tax. The deferred tax is equivalent to an interest free loan from the government, which is repaid by means of increased tax payments in the event the SP chooses to reduce the capital stock of the firm ($\dot{E} < 0$ adds to taxable earned income, but also yields a refund of expansion fund tax, t).

It is fairly straightforward to determine the implications of the alternative modes of income splitting for the cost of capital of the SP. We first assume that the SP sticks to interest distribution. With k as the after-tax rate of return required by the SP, the pre-tax return on new marginal investment, p , must satisfy the condition (cf. equation (13))

$$k = p - \left(\frac{t_{pw} + p}{1 + p} \right) (p - r) - t_{pi} r, \quad (18)$$

which yields

$$p = \frac{k}{1 - t_{pi}} + \left(\frac{k}{1 - t_{pi}} - r \right) \left(\frac{(1 - t_{pi}) - \frac{1 - t_{pw}}{1 + p}}{\frac{1 - t_{pw}}{1 + p}} \right). \quad (19)$$

For the cost of capital to be invariant to the taxation of earned income the presumptive rate of return on the net worth of the firm must be set $r = \frac{k}{1 - t_{pi}}$, that is equal to the SP's pre-tax rate of return requirement. Moreover, when the SP's after-tax required rate of return equals the after tax market interest rate, $k = i(1 - t_{pi})$, overall tax neutrality ($p = i$) requires that $r = i$.

If the SP instead chooses to allocate income to his expansion fund, an investment of unit value will enable the SP to reduce taxable earned income by a maximum of $1/(1 - t)$, see equation (17). Since allocations to the expansion fund suffer tax at the rate t , the allocation results in a net tax gain – or rather deferral of tax - of $g \equiv (1/(1 - t)) \left(\frac{t_{pw} + p}{1 + p} - t \right)$ per unit of

investment. The effect of this is that the SP's need for own funding is reduced to $(1 - g)$ per unit of investment. The pre-tax return on new investment must hence satisfy

$$k(1 - g) = \mathbf{p}(1 - \mathbf{t}_{pw}), \quad (20)$$

and with $g \equiv (1/(1 - \mathbf{t})) \left(\frac{\mathbf{t}_{pw} + p}{1 + p} - \mathbf{t} \right)$, we derive

$$\mathbf{p} = \frac{k}{1 - \mathbf{t}}. \quad (21)$$

The cost of capital is simply the SP's pre-tax rate of return requirement. An exact comparison between expressions (19) and (21) is complicated because of the (small) difference between tax rates \mathbf{t} and \mathbf{t}_{pi} . Ignoring this difference (i.e. assuming $\mathbf{t} = \mathbf{t}_{pi}$), however, we find that allocations to the expansion fund will be the preferred way of income splitting (giving the lowest cost of capital) if $\frac{k}{1 - \mathbf{t}} > \mathbf{r}$. Conversely, the SP will choose to split income through interest distribution if $\frac{k}{1 - \mathbf{t}} < \mathbf{r}$. Hence, allocation to the expansion fund is equivalent to the possibility to choose interest distribution, with a presumptive rate of return $\mathbf{r} = \frac{k}{1 - \mathbf{t}}$.

Finally, a new investment fully financed by debt, offers no additional opportunity to allocate income to the expansion fund, nor additional income splitting through interest distribution, (cf. (15) and (17)). The pre-tax rate of return \mathbf{p} on a debt-financed marginal investment must therefore simply satisfy

$$i = \mathbf{p} - \mathbf{t}_{pw}(\mathbf{p} - i), \quad (22)$$

and hence

$$\mathbf{p} = i. \quad (23)$$

That is, the required pre-tax rate of return, or the cost of capital, of a debt financed marginal investment is the market interest rate. Note also that with $k = i(1 - t)$ equity funding requires no higher pre-tax rate of return, cf. equation (21).

4 Income splitting, risk-taking and the cost of capital

An interesting and potentially important property of the income-splitting models for taxing CHC and SP is that the tax levied on the imputed rate of return is lower than the tax on excess (residual) returns – which are taxed as labor income, rather than as income from capital.

Hagen and Sørensen (1998) point out that such a differential tax treatment in combination with full loss offset may in fact be beneficial to risk-taking, the well-known reason being that the higher marginal tax rate on the uncertain residual return provides a higher degree of income insurance to the investor.

This section further explores the implications of this mechanism by deriving an explicit expression for the cost of capital with uncertainty and income splitting. We use a simplified version of the mean-variance model developed by Apel and Södersten (1999) in a recent issue of *International Tax and Public Finance*. Apel and Södersten (A-S) investigate the effects of personal taxes on the cost of capital in a small open economy. In their model, investors are assumed to hold three assets, i.e. risk-free bonds, shares in large firms and shares in small firms. Shares in large corporations are traded in the international stock market, implying that the (pre-personal tax) rates of return are exogenously given to the national economy. Small company shares, in contrast, are traded only domestically and the authors' problem is to determine the impact of taxation on the required (pre-personal tax) rate of return on these shares.

In our version of the A-S model (see Appendix for a brief derivation), we let small companies be CHC subject to income splitting. To focus on personal taxes, we ignore the corporate income tax ($t = 0$) and we define the labor income tax t_{pw} to include the payroll tax. Rather than repeating the derivation of the full A-S model, we explain the key equations in an intuitive way, focusing on the effects of differentiating shareholder taxes between large companies (assumed to be widely held, i.e. WHC) and small companies (CHC).

We follow A-S and assume that the risk-free interest rate, R_f , and return on large company shares, $E(\mathbf{p}_L)$, are exogenously determined. The portfolio problem is then – given that the investment in CHC-shares amounts to the proportion \mathbf{a}_s of the investor's wealth - to

determine how much to invest in large company shares \mathbf{a}_L and in risk-free bonds (with portfolio share $1 - \mathbf{a}_L - \mathbf{a}_S$).

With \mathbf{p}_S as the pre-tax rate of return on CHC-shares, \mathbf{r} as the imputed rate of return and residual income taxed as income from labor, the shareholder's after-tax return is

$$\mathbf{p}_S - \mathbf{t}_{pi} \mathbf{r} - \mathbf{t}_{pw} (\mathbf{p}_S - \mathbf{r}) \equiv \mathbf{p}_S (1 - \mathbf{t}_{pw}) + \mathbf{r} (\mathbf{t}_{pw} - \mathbf{t}_{pi}). \quad (25)$$

The A-S portfolio model then gives the expected after-tax return on CHC-shares as

$$\begin{aligned} E(\mathbf{p}_S) (1 - \mathbf{t}_{pw}) + \mathbf{r} (\mathbf{t}_{pw} - \mathbf{t}_{pi}) = \\ R_f (1 - \mathbf{t}_{pi}) + c \left[\mathbf{a}_S \mathbf{s}_S^2 (1 - \mathbf{t}_{pw})^2 + \mathbf{a}_L \mathbf{s}_{SL} (1 - \mathbf{t}_{pi}) (1 - \mathbf{t}_{pw}) \right], \end{aligned} \quad (26)$$

where the first term on the right-hand side is the risk-free return on bonds taxed at the capital income tax rate \mathbf{t}_{pi} , and the second term is the risk-premium. The size of this risk-premium depends on the investor's risk tolerance, measured by c , multiplied by the amount of risk that the CHC-shares add to the investor's portfolio. This amount is expressed as a weighted average of the variance of the return on the CHC-shares, $\mathbf{s}_S^2 (1 - \mathbf{t}_{pw})^2$, and the co-variance between the returns on CHC-shares and large company shares, $\mathbf{s}_{SL} (1 - \mathbf{t}_{pi}) (1 - \mathbf{t}_{pw})$. The weights are the portfolio shares, \mathbf{a}_S and \mathbf{a}_L . The before-tax expected rate of return (the cost of capital) is hence⁵

$$\begin{aligned} E(\mathbf{p}_S) &= R_f \left(\frac{1 - \mathbf{t}_{pi}}{1 - \mathbf{t}_{pw}} \right) - \mathbf{r} \left(\frac{\mathbf{t}_{pw} - \mathbf{t}_{pi}}{1 - \mathbf{t}_{pw}} \right) + c \left[\mathbf{a}_S \mathbf{s}_S^2 (1 - \mathbf{t}_{pw}) + \mathbf{a}_L \mathbf{s}_{SL} (1 - \mathbf{t}_{pi}) \right] \\ &\equiv R_f + (R_f - \mathbf{r}) \left(\frac{\mathbf{t}_{pw} - \mathbf{t}_{pi}}{1 - \mathbf{t}_{pw}} \right) + c \left[\mathbf{a}_S \mathbf{s}_S^2 (1 - \mathbf{t}_{pw}) + \mathbf{a}_L \mathbf{s}_{SL} (1 - \mathbf{t}_{pi}) \right]. \end{aligned} \quad (27)$$

⁵ Equation (27) may be compared to equation (8) in section 3, defining the CHC's cost of capital with new equity as the source of funds in the full certainty case. For easy comparison, let $\mathbf{t} = 0$, $\mathbf{p} = 0$ and $k = R_f (1 - \mathbf{t}_{pi})$ in equation (8).

The investor's problem is also to determine the amount to be invested in large company shares, \mathbf{a}_L , and we derive from the model (see Appendix)

$$\mathbf{a}_L = \frac{E(\mathbf{p}_L) - R_f - c\mathbf{a}_S(1 - t_{pw})\mathbf{s}_{SL}}{c(1 - t_{pi})\mathbf{s}_L^2}. \quad (28)$$

The intuitively clear answer given by the portfolio model is that \mathbf{a}_L is larger (the share of risk-free bonds smaller) the higher is the expected return on large company shares. A high variance \mathbf{s}_L^2 for the return on large company shares and a large covariance \mathbf{s}_{SL} between the returns on large and small company shares has the opposite effect. In case the covariance is negative ($\mathbf{s}_{SL} < 0$), investing more in large company shares reduces risk.

The special income splitting rules affect both the portfolio holdings of large company shares and the required rate of return on CHC-shares. Combining (27) and (28), it is straightforward to demonstrate that the risk-premium in (27) is lower, the higher is the labor income tax. The negative impact of this on the cost of capital is reinforced when the imputed return is set above the risk-free interest rate, $\mathbf{r} > R_f$. As explained above, this condition is clearly met in the Swedish tax code.

5 Summary of Results and Conclusions

In this article we have analyzed the economic effects of the different income splitting rules that apply to closely held corporations (CHC) and sole proprietorships/partnerships (SP) in Sweden. For CHC, the rules were enacted to combat the tax shifting incentives that followed from the introduction (in Sweden as well as in the other Nordic countries) of the *dual income tax* in the beginning of the 1990's. For SP, where the basic rule is to tax all income as income from labor, the special rules mitigate the impact of taxation by allowing a presumptive rate of return on business net worth to be taxed at the low (flat-rate) personal income tax rate, and by offering a possibility to retain funds within the business, subject to the same tax rate as corporate firms. A summary of the results from section 3 is given in table 2.

Table 2. Summary of results

	Debt		Equity
WHC	i	RE	$\frac{k}{(1-t)(1-t_{pc})}$
		NI	$\frac{k}{(1-t)(1-t_{pi})}$
CHC	i	RE	$\frac{k}{(1-t)(1-t_{pc}^w)}$
		NI	$\frac{k}{(1-t)(1-t_{pi})} + \left(\frac{k}{1-t_{pi}} - r \right) \left(\frac{(1-t)(1-t_{pi}) - \frac{1-t_{pw}}{1+p}}{\frac{(1-t)(1-t_{pw})}{1+p}} \right)$
SP	i	EXP	$\frac{k}{1-t}$
		INT	$\frac{k}{1-t_{pi}} + \left(\frac{k}{1-t_{pi}} - r \right) \left(\frac{(1-t_{pi}) - \frac{1-t_{pw}}{1+p}}{\frac{1-t_{pw}}{1+p}} \right)$
Notes			
WHC is a widely held corporation, CHC a closely held corporation and SP a sole proprietorship.			
RE is retained earnings, NI is new equity issue, EXP is expansion fund, INT is interest distribution			

With debt as the source of funds for new investment, the cost of capital is the market interest rate, irrespective of organizational form. For the two corporate forms, the cost of retained earnings differ only to the extent that capital gains taxation is somewhat higher for CHC ($t_{pc}^w > t_{pc}$, because half of the realized gain on CHC-shares is taxed as labor income). With new equity, the comparison between CHC and WHC hinges upon the relationship between the shareholder's pre-tax rate of return requirement and the presumptive rate of return. In conclusion, therefore, it seems that the income splitting rules (*a source model*) designed to prevent the owners of CHC from transforming labor income into income from capital do well in the sense that the offer roughly the same investment incentives as for WHC.

Ignoring the small difference between the tax rate on expansion funds (equal to the corporate tax rate) and the personal tax on capital income, the two modes of income splitting (expansion funds and interest distribution) available to the SP differ only to the extent the imputed rate of return differs from the shareholder's pre-tax rate of return requirement. With

the after-tax return requirement equal to the after-tax interest rate ($k = i(1 - t_{pi})$), and the imputed rate of return set equal to the market interest rate, SP's cost of capital is the market interest rate, that is independent of tax and source of funds. A further result is that the cost of capital of SP generally is below that of incorporated firms, the reason being that the income splitting methods not only eliminate the effects of the high labor income tax, but also avoid the two-tier taxation of corporate source income. Harberger's (1962) early conclusion about the allocation effects of the corporate income tax therefore seems to be a valid characterization of the tax treatment of business income in Sweden.

Adding risk to the model shows that the special income splitting rules of CHC affect both the portfolio holdings of investors and the required rate of return on CHC- shares. The differential tax treatment of CHC reduces the cost of capital not only because labor income taxation of the uncertain residual return provides a higher degree of income insurance to the investor, but also because the imputed rate of return typically is set above the risk-free interest rate.

Clearly, there are a number of aspects to the tax treatment of different organizational forms that have been ignored in this paper. The results for the uncertainty case crucially assume that gains and losses are treated symmetrically, even though real world tax systems – including those of the Nordic countries - hardly motivate this assumption. An additional aspect is the cost to the taxpayers of complying with the tax rules. Though there is little reliable and systematic information on this, there is a widespread view in the public debate that the income splitting rules of both CHC and SP are excessively complicated and time-consuming to comply with. Complication gives rise to unintentional mistakes but it also opens up for avoidance and evasion. A further aspect, and an obvious topic for further research, is the incentive for choosing one organizational form to the other, and for switching from being an employee to being a self-employed proprietor.

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Appendix: Income splitting and the cost of capital in a portfolio model

We draw on Apel and Södersten (1999) to set up a simple portfolio model, which covers two periods. In period 1, the representative investor is assumed to maximize his expected utility of wealth in period 2

$$\max_{\{\mathbf{a}_B, \mathbf{a}_S, \mathbf{a}_L\}} E\left\{U\left[W(1+r)\right]\right\} \approx \bar{r} - \frac{c}{2} \mathbf{s}^2, \quad (\text{A1})$$

subject to

- i) $\bar{r} = \mathbf{a}_f R_f (1 - \mathbf{t}_{pi}) + \mathbf{a}_L E(\mathbf{p}_L) (1 - \mathbf{t}_{pi}) + \mathbf{a}_S \left[E(\mathbf{p}_S) (1 - \mathbf{t}_{pw}) + \mathbf{r} (\mathbf{t}_{pw} - \mathbf{t}_{pi}) \right]$,
- ii) $\mathbf{a}_f + \mathbf{a}_L + \mathbf{a}_S = 1$.

In (A1), W is initial wealth, c is Arrow-Pratt's measure of relative risk aversion, and \bar{r} the after-tax expected return on the investor's portfolio. \mathbf{a}_j is the portfolio share of asset j ($j = f, S, L$; where f represents bonds, S shares in small closely held firms, and L shares in large firms), R_f is the risk-free return on bonds, and $E(\mathbf{p}_j)$ is the expected pre-tax return on asset $j = S, L$. The tax rates \mathbf{t}_{pi} and \mathbf{t}_{pw} are defined in the main text. The portfolio variance in (A1) equals

$$\mathbf{s}^2 = \mathbf{a}_L^2 (1 - \mathbf{t}_{pi})^2 \mathbf{s}_L^2 + \mathbf{a}_S^2 (1 - \mathbf{t}_{pw})^2 \mathbf{s}_S^2 + 2\mathbf{a}_L \mathbf{a}_S (1 - \mathbf{t}_{pi})(1 - \mathbf{t}_{pw}) \mathbf{s}_{SL}, \quad (\text{A2})$$

where \mathbf{s}_{jh} is the covariance between the pre-tax returns on asset j and h . The first-order conditions for the portfolio allocation problem (A1) gives the expected pre-tax returns on shares

$$\begin{aligned} E(\mathbf{p}_S) &= R_f \left(\frac{1 - \mathbf{t}_{pi}}{1 - \mathbf{t}_{pw}} \right) - \mathbf{r} \left(\frac{\mathbf{t}_{pw} - \mathbf{t}_{pi}}{1 - \mathbf{t}_{pw}} \right) + c \left[\mathbf{a}_S \mathbf{s}_S^2 (1 - \mathbf{t}_{pw}) + \mathbf{a}_L \mathbf{s}_{SL} (1 - \mathbf{t}_{pi}) \right] \\ &\equiv R_f + (R_f - \mathbf{r}) \left(\frac{\mathbf{t}_{pw} - \mathbf{t}_{pi}}{1 - \mathbf{t}_{pw}} \right) + c \left[\mathbf{a}_S \mathbf{s}_S^2 (1 - \mathbf{t}_{pw}) + \mathbf{a}_L \mathbf{s}_{SL} (1 - \mathbf{t}_{pi}) \right], \end{aligned} \quad (\text{A3})$$

and

$$E(\mathbf{p}_L) = R_f + c \left[\mathbf{a}_L \mathbf{s}_L^2 (1 - \mathbf{t}_{pi}) + \mathbf{a}_S \mathbf{s}_{SL} (1 - \mathbf{t}_{pw}) \right]. \quad (\text{A4})$$

As explained in the main text, we treat $E(\mathbf{p}_L)$ and \mathbf{a}_S as exogenous. The investor's problem is hence to determine the expected rate of return on closely held shares $E(\mathbf{p}_S)$ and the amount to be invested in large company shares, \mathbf{a}_L . We derive from the model

$$\mathbf{a}_L = \frac{E(\mathbf{p}_L) - R_f - c \mathbf{a}_S (1 - \mathbf{t}_{pw}) \mathbf{s}_{SL}}{c(1 - \mathbf{t}_{pd}) \mathbf{s}_L^2}. \quad (\text{A5})$$

Using (A5), we find from (A3) that $\frac{\partial E(\mathbf{p}_S)}{\partial \mathbf{t}_{pw}} < 0$, and it is also clear from (A3) that

$\frac{\partial E(\mathbf{p}_S)}{\partial \mathbf{r}} < 0$. We conclude therefore, that the income-splitting rules for CHC reduce the cost of capital.