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**Neutral Taxation of Shareholder Income:
A Norwegian Tax Reform Proposal**

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NEUTRAL TAXATION OF SHAREHOLDER INCOME: A NORWEGIAN TAX REFORM PROPOSAL

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Abstract: A Norwegian tax reform committee recently proposed a personal tax on the realized income from shares after deduction for an imputed risk-free rate of return. This paper describes the design of the proposed shareholder income tax and shows that it will be approximately neutral in several important dimensions, provided that full loss offsets are granted. Thus the tax allows some non-distortionary double taxation of corporate equity income. With an appropriate choice of tax rates, it also solves the problem of income shifting under a dual income tax. The final part of the paper clarifies the differences between the shareholder income tax and previous proposals for neutral capital income taxation.

Keywords: tax neutrality, shareholder income tax, corporate-personal tax integration

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1. A tax policy dilemma

Under a pure comprehensive income tax the taxpayer faces the same marginal tax rate on all types of income, since the tax schedule is applied to the sum of his income from all sources. This feature of non-discrimination is often seen as the main virtue of the comprehensive income tax.

In practice, income from capital tends to be taxed at a lower rate than labour income in most OECD countries.¹ One reason is that social security taxes are usually levied only on labour income. Another reason is that governments have chosen to grant tax favours to important forms of capital income such as the imputed return on owner-occupied housing and the return to saving for retirement. Some countries also tax ordinary interest income at concessionary rates, and capital gains are rarely taxed at the high marginal rates applied to labour income, due to the distortionary lock-in effects of realization-based capital gains taxation.

At the same time the coexistence of the corporate and the personal income tax may potentially drive the total effective tax rate on corporate equity income significantly above the tax rate imposed on other forms of capital income. To prevent undue discrimination against corporate investment, most OECD governments therefore alleviate the double taxation of corporate equity income in one way or another, e.g., by granting dividend tax credits or by taxing dividends at a reduced rate at the shareholder level. However, while this reduces investment distortions, it also means that the labour income earned by corporate owner-managers is often taxed at a much lower rate than labour income earned outside the corporate sector.

Thus governments are faced with a dilemma. If they want to avoid tax discrimination against investment in the corporate sector, they must alleviate the double taxation of corporate equity income to bring the total tax on the return to corporate investment

in line with the tax rate applied to other forms of capital income. But tax relief for dividends and capital gains on shares may open the door to tax avoidance via income shifting: if labour income is taxed more heavily than corporate equity income, controlling shareholders working in their own company may reduce their tax bill by transforming management wages into dividends or capital gains on shares.

This dilemma is particularly acute in countries which have introduced some form of *dual income tax* where income from capital is taxed at a low flat rate while progressive surtaxes are levied only on labour income. The dual income tax exists in its purest form in Norway, Sweden and Finland, but several other countries such as Austria, Belgium, France, Iceland, Italy, Japan and Portugal have moved in the direction of dual income taxation by introducing a separate flat tax on interest income at a rate considerably below the top marginal tax rate on labour income. In these countries any attempt to reduce the total tax burden on corporate equity to the level of the interest income tax would imply a huge tax saving for entrepreneurs who can transform labour income earned in the corporate sector into dividends or capital gains on shares.

In Norway a government-appointed expert committee has recently proposed a way out of this dilemma (Skatteutvalget, 2003). The committee suggested a new system of shareholder income taxation which will ensure investment neutrality and yet prevent any significant gains from income shifting by corporate owner-managers. Although developed in a Norwegian context, the proposal is relevant for all countries experimenting with some form of dual income taxation. Indeed, even in countries which try to adhere to the principle of comprehensive income taxation, the dilemma described above will exist to the extent that social security taxes are only levied on labour income. Moreover, the proposed system of shareholder income taxation represents a new approach to the perennial problem of integrating the corporate and the personal income tax. Hence the Norwegian proposal should be of general interest to an international audience.

Against this background the present paper reviews the recent report from the Norwegian tax reform committee. As a starting point, Part 2 briefly describes the Norwegian experience with the dual income tax. Part 3 then provides an overview of the new system of shareholder income taxation proposed by the Norwegian committee, analyzing the neutrality properties of the system and explaining how it prevents tax avoidance. The

concluding Part 4 discusses the advantages and disadvantages of the proposed shareholder income tax compared to other forms of neutral capital income taxation previously suggested in the literature.

2. The Norwegian experience with the dual income tax

2.1. The Norwegian tax reform of 1992

As already mentioned, several countries have recently moved towards some form of dual income taxation. In its purest form, the dual income tax is characterized by the following features: 1) A flat uniform personal tax on all forms of capital income, levied at a rate equal to the corporate income tax rate; 2) Full relief for the double taxation of corporate equity income; 3) A broad tax base for capital income and corporate income, aiming to bring taxable income in line with true economic income, and 4) A basic tax rate on labour income equal to the capital income tax rate combined with a progressive surtax on high labour income.²

The case for this variant of schedular income taxation has been discussed at length by Sørensen (1994, 1998) and Cnossen (1995, 2000). The arguments for the dual income tax include, among other things, the need to keep the capital income tax low in a small open economy faced with the possibility of capital flight; the advantages of aligning the personal capital income tax rate with the corporate tax rate to reduce investment distortions and to limit the scope for tax arbitrage, and the political economy observation that it is easier to preserve a broad and fairly neutral capital income tax base when the capital income tax rate is not too high.

The Norwegian tax reform of 1992 introduced the cleanest version of the dual income tax found so far. The reform was remarkable for its boldness and consistency. The corporate tax rate was almost cut in half, to a level of 28 percent, and a similar flat tax rate on personal capital income and on labour income below a certain threshold was introduced, combined with a two-bracket progressive surtax on high labour income. At the same time the tax base - in particular the business income tax base - was broadened very substantially. Various special tax credits and deductions were abolished, depreciation rates for tax purposes were brought much closer to prevailing estimates of true economic

depreciation rates, and realized capital gains on business assets were included in the tax base.

Double taxation of dividends was fully relieved via an imputation system granting full credit for the underlying corporation tax against the personal tax on dividends. Reflecting the zeal with which Norwegian policy makers pursued the goal of tax neutrality, the 1992 tax reform also introduced an innovative method for alleviating the double taxation of retained corporate profits: in calculating the taxable capital gain on shares, shareholders were allowed to step up the basis of their shares by an amount equal to the taxable corporate income retained in the corporation. Thus the capital gains tax was levied only on gains in excess of the retained profit which had already been taxed at the corporate level.³

Estimates of marginal effective tax rates indicated that the tax reform of 1992 led to a much more neutral system of capital income taxation, by eliminating tax subsidies to many types of investment with low pre-tax profitability. After 1992 the Norwegian economy experienced a significant rise in the average pre-tax rate of return on business investment and a rise in the private savings rate. In addition, there was a significant increase in corporate distributions, reflecting a higher degree of capital mobility within the corporate sector and between the corporate and the household sector. Although part of this development may have resulted from an upturn of the business cycle, there is little doubt that the tax reform of 1992 contributed to the improved allocation of capital in the Norwegian economy (see Skatteutvalget, 2003, chapter 3).

The most obvious shortcoming of the Norwegian tax reform of 1992 related to the tax treatment of owner-occupied housing. For political reasons, the taxable rent imputed to homeowners was set at an unrealistically low level, despite the fact that the tax law allowed full deductibility of mortgage interest expenses from the capital income tax base. As a consequence, the post-1992 tax system continued to imply substantial tax subsidies to investment in owner-occupied housing. The Norwegian wealth tax also continued to be applied in a highly discriminatory manner across different asset types, distorting investment incentives for the wealthy. Finally, the tax treatment of small enterprises under the dual income tax turned out to be a problem.

2.2. Taxing income from small enterprises: the Achilles Heel of the dual income tax

In small and medium-sized enterprises it is quite common that (some of) the owners work in their own firm, typically as managers. For these 'active' owners the income from the firm is partly a remuneration for their labour and partly a return on the capital they have invested in the enterprise. If capital income is taxed at a much lower (marginal) rate than labour income, active owners obviously have a tax incentive to label income from the firm as capital income rather than labour income, e.g., by transforming management wages into dividends or capital gains on shares. To prevent such tax avoidance, a dual income tax must include rules stipulating how the income from firms with active owners is to be split into capital income and labour income.⁴

Under the Norwegian dual income tax, income splitting is mandatory for entrepreneurs who carry out a certain minimum amount of work in their firm and who have an ownership share of at least two thirds in the firm. When calculating the ownership share, shares owned by closely related persons are added to the shares owned directly by the entrepreneur himself. For taxpayers satisfying the work test and the ownership test the taxable income from the firm is split into an imputed return on the business assets, which is taxed as capital income, and the residual profit, which is taxed as labour income. However, if the residual profit exceeds a certain cap, the excess amount is taxed as capital income (except for the professions such as doctors, lawyers etc.). The motivation for this rule is that if the residual profit is very high relative to a normal wage income, part of this profit is likely to represent a return to capital rather than a reward for labour. Furthermore, entrepreneurs with employees may deduct 20 percent of their wage bill from the residual profit subject to progressive taxation, up to a certain limit. The official rationale for this 'salary deduction' is that the estimated labour income for owners of firms with little physical investment and many employees would otherwise be unreasonably high, and that the deduction is meant to compensate for the fact that self-created goodwill is not included in the basis for calculating the imputed rate of return on capital. With a few modifications, the basis for calculating the imputed rate of return is the stock of business assets recorded in the firm's tax accounts. The rate of return is currently set equal to the interest rate on five year government bonds plus a risk premium of 4 percent.

In 2003 the imputed rate of return is 10 percent.

The Norwegian rules for mandatory income splitting are applied to sole proprietorships, partnerships and corporations with active owners. The rules were meant to prevent tax avoidance through income shifting, but for corporate firms they seem to have had little success in achieving this goal. Between 1992 and 2000 the proportion of corporations subject to income splitting fell from 55 percent to 32 percent, indicating that a growing number of taxpayers were able to avoid income splitting by inviting 'passive' owners into the company. Moreover, in the late 1990s almost 80 percent of the 'active' shareholders subject to income splitting had a *negative* labour income for tax purposes, suggesting that the deductions from the estimated labour income were much too favourable.

Two trends in the 1990s contributed to the undermining of the Norwegian system of income splitting for active owners. Between 1992 and 2003 the wedge between the top marginal effective tax rate on labour income (including payroll tax and social security tax) and the tax rate on capital income rose from 28.1 percentage points to 36.7 percentage points, increasing the incentive to transform labour income into capital income for tax purposes.⁵ Moreover, in the decade following the tax reform the rules for income splitting were changed on several occasions, mostly in the direction of a more favourable tax treatment of active owners. At the turn of the new century it was therefore widely felt that the Norwegian income splitting system had failed to achieve its goal of securing an equal tax treatment of active owners and other groups of taxpayers. Reforming or replacing this system was thus an important part of the mandate for the tax reform committee established by the Norwegian government at the beginning of 2002 and releasing its report in February 2003.

3. The Norwegian tax reform committee of 2003

The Norwegian tax reform committee, headed by former Minister of Finance Arne Skauge, suggested a wide range of changes in the entire tax system. The basic guideline for the Skauge committee was a desire to strengthen the principles of tax neutrality underlying the pathbreaking 1992 reform. Hence the committee proposed to raise the taxation of the imputed rent on owner-occupied housing to a more realistic level. It also proposed

to phase out the highly discriminatory Norwegian wealth tax and to recoup (part of) the lost revenue via a general tax on immovable property and/or via a (further) rise in the tax on imputed rent. The idea was to improve resource allocation and to allow for the growing international mobility of capital by lowering the tax burden on mobile capital while reducing the tax subsidies to immobile capital. In addition, the committee proposed several measures to broaden the tax base and to lower the high marginal tax rates on labour income, with the aim of reducing incentives for income shifting and stimulating labour supply.

The Skauge committee devoted a large part of its efforts to analyzing alternative solutions to the problems of income splitting and income shifting under the dual income tax. In the remainder of this paper I will focus on these aspects of the committee report which involve the classical problem of integrating the corporate and the personal income tax.

3.1. Some roads not taken

Before describing the Norwegian committee proposal for corporate-personal tax integration, it may be of interest to consider a couple of the alternatives which were analyzed but rejected by the committee.

Progressive taxation of personal capital income. Since the need for splitting the income of active owners arises from the differential tax treatment of capital and labour, it might seem natural to give up the dual income tax and return to a comprehensive income tax where personal income from capital is taxed at the same marginal rate as labour income. The main reason why the Skauge committee did not recommend such a solution was the desire to keep the personal tax rate on capital income in line with the corporate tax rate. Because of the high international mobility of corporate investment and the difficulty of implementing residence-based taxation of corporate income, the committee found it undesirable to raise the Norwegian corporate income tax rate. Under a comprehensive income tax the marginal personal tax rate on capital income would therefore have to be much higher than the corporate tax rate, even if the top marginal personal tax rates were brought down considerably. Given the impracticality of accruals-based taxation of capital gains on shares, accumulation of retained profits

within the corporate sector would then be favoured by the tax system, compared to saving and investment via the open capital market. This might cause capital to be locked into relatively unproductive investment projects in existing corporations, as was the case before the tax reform of 1992. In addition, even under moderate inflation, full progressive taxation of nominal capital income coupled with full interest deductibility would imply overtaxation of the real return to saving and would amplify the tax subsidies to homeownership in the likely case where a realistic rental value could not be imputed to homeowners. Finally, reintroducing progressive capital income taxation might open the door to tax arbitrage exploiting differences in marginal tax rates across taxpayers. Hence the committee (except for one member) recommended to maintain the dual income tax.

A classical corporate tax system. While the Norwegian income splitting system has failed to prevent tax avoidance by active shareholders, it has worked reasonably well for sole proprietorships where it is much more difficult to avoid mandatory income splitting via changes in the firm's ownership structure. One way of coping with income shifting might then be to maintain the splitting system for proprietors, and to impose a personal tax on dividends and capital gains on shares to ensure a total corporate and personal tax burden on shareholder income roughly equal to the top marginal tax rate on labour income. In this way active shareholders would not be able to reduce their tax bill by paying themselves shareholder income rather than managerial wages. Although such a system would involve an additional tax burden on shareholder income compared to other forms of capital income, this might not increase the cost of equity capital for Norwegian companies whose shares are traded in international stock markets, since the marginal shareholders in these companies are likely to be foreigners who are not subject to Norwegian personal tax rules. However, the Skauge committee was concerned that full double taxation of corporate equity income would distort investment in small and medium-sized Norwegian companies without access to the international stock market. The committee was aware that, in a small open economy where some shares are traded in the international stock market whereas others are not, a tax on personal shareholder income will not necessarily drive up the *average* required return on non-traded shares, as pointed out by Apel and Södersten (1999). But as shown in the appendix to the present paper, a personal tax on the full return to shares will systematically distort the pattern

of risk-taking by *raising* the required rate of return on non-traded shares whose returns are weakly correlated with the return on the market portfolio of shares, while *reducing* the required risk premium on non-traded shares whose returns are strongly correlated with the return on the market portfolio. Intuitively, for highly risky shares with a strong covariance with the market portfolio, the benefit from the income insurance offered by a symmetric tax on dividends and capital gains (with full loss offset) outweighs the fact that the tax reduces the average net rate of return relative to the net return on safe assets. In contrast, for shares with low riskiness the insurance effect of the tax is less important, so the tax makes the holding of such shares less attractive. A personal tax on the full return to shares will therefore tend to stimulate investment in small companies whose profits vary strongly with the business cycle, at the expense of investment in small companies with a low sensitivity to the cycle. The Skauge committee felt that it would be hard to preserve and promote the general principles of tax neutrality in other areas of the tax system if the committee proposed a form of double taxation of shareholder income which would systematically distort the pattern of investment in small and medium-sized companies. Hence the committee looked for a way of taxing corporate equity income which would be neutral while at the same time eliminating the scope for income shifting.

3.2. A neutral shareholder income tax: the basic design

Having rejected the alternatives discussed above, the Norwegian tax reform committee proposed instead that the income splitting system for 'active' shareholders be replaced by a personal tax on the *equity premium*, i.e., a personal tax on returns to shares in excess of the after-tax interest rate on government bonds.⁶ According to the proposal, the equity premium is included in the shareholder's taxable capital income. The combination of corporation tax and personal capital income tax means that corporate equity income above the normal return to saving will be taxed at a total marginal rate which is roughly in line with the top marginal tax rate on labour income, given the tax schedule for labour income proposed by the committee. In principle this will eliminate the scope for income shifting by active shareholders. The present section explains the basic design features of this shareholder income tax and illustrates the neutrality properties of the system. The subsequent sections will discuss further aspects of the system.

The shareholder income tax is supposed to be levied on the equity premium on shares in Norwegian and foreign companies owned by personal taxpayers resident in Norway. The imputed return which is deducted from taxable shareholder income will be termed the Rate-of-Return-Allowance, denoted RRA. The tax is levied on the realized income from shares after deduction of the RRA. The realized income from a share consists of the dividend plus any realized capital gain minus any realized capital loss. A realized loss on one share may be offset against gains on other shares, and any remaining loss may be carried forward with interest (see the detailed discussion of loss offsets in section 3.3). The RRA is the product of the after-tax interest rate and the stepped-up basis (SUB) of the share at the start of the year. The SUB is the sum of the original acquisition price of the share and all the RRAs on the share not utilized in previous years. If the RRA exceeds the realized income from the share in any given year, the unutilized part of the RRA is thus added to the basis of the share for the following year.

A simple numerical example may illustrate the workings of these rules and demonstrate that the shareholder income tax is in principle neutral. We consider a shareholder who injects equity into a company at the start of year 1, receives a dividend at the end of year 1, and a dividend *or* a capital gain on the share at the end of year 2. The after-tax interest rate as well as the return to the company's investment after corporation tax are assumed to be 5%. We thus consider a corporate investment project which is just barely worth undertaking in the absence of the shareholder income tax. The example assumes that one krone retained in the corporation will *ceteris paribus* generate a one krone increase in the value of shares in the company, as long as the retained profit does not exceed the shareholder's tax free imputed return.⁷ The transactions of the company and the shareholder are as follows:

Year 1

1. Injection of equity at the start of the year	1000
2. Profit after corporation tax (5% of 1.)	50
3. Dividend	30
4. Retained profit (2.-3.)	20
5. RRA (5% of 1.)	50
6. Unutilized RRA (5.-3.)	20

Year 2

7. Stepped-up basis of share (1.+6.)	1020
8. Profit after corporation tax (5% of (1.+4.))	51
9. RRA (5% of 7.)	51

Scenario 1: Shares are realized at the end of year 2

10. Revenue from sale of share at the end of year 2 (1.+4.+8.)	1071
11. Stepped-up basis of share at the start of year 2 (=7.)	1020
12. RRA for year 2 (=9.)	51
13. Taxable capital gain (10.-11.-12.)	0

Scenario 2: All profits are distributed at the end of year 2

14. Dividend at the end of year 2 (4.+8.)	71
15. Total RRA (6.+9.)	71
16. Taxable dividend (14.-15.)	0

Whether the shareholder's return takes the form of dividends or capital gains, we see that he will end up with zero taxable income in both scenarios. Hence a corporate investment which is marginal in the absence of the shareholder income tax will still be marginal in the presence of the tax, i.e., the shareholder tax will leave the cost of corporate capital unaffected.⁸ In particular, note that the step-up of the shareholder's basis ensures that a marginal corporate investment financed by retained profits is shielded from tax at the shareholder level. Via the step-up of basis, an RRA which is not utilized in the current year is effectively carried forward at an interest rate equal to the imputed normal return on the stepped-up basis. A corporate investment project financed by retentions and yielding a normal rate of return will be shielded from shareholder tax through this carry-forward mechanism. Hence the system is neutral between financing by new equity and financing by retained earnings.

Just as it does not distort real investment decisions, the shareholder income tax will not distort the timing of the realization of shares, even though the capital gains tax is deferred until the time of realization. This is illustrated by the example below, where the shareholder at the end of year zero holds shares with a current market value above the stepped-up basis, reflecting large capital gains accrued in the past. The shareholder may

postpone the realization of his gain until the end of year 1 (Scenario 1), or he may realize it immediately and invest his funds in the capital market (Scenario 2). In both cases he is assumed to earn an expected normal rate of return equal to 5% of his wealth *before* shareholder tax. In the absence of the tax he will thus be indifferent between immediate or postponed realization of his accrued capital gain. The example shows that he will also be equally well off in the two scenarios *after* the introduction of the shareholder income tax (assumed to be levied at the 28% rate applied to capital income in Norway):

The shareholder's status at the end of year 0

1. Stepped-up basis of share	1000
2. Market value of share	2000

Scenario 1: The share is held until the end of year 1

3. Revenue from sale of share at the end of year 1 (105% of 2.)	2100
4. RRA for year 1 (5% of 1.)	50
5. Taxable capital gain at the end of year 1 (3.-1.-4.)	1050
6. Tax on capital gain (28% of 5.)	294
7. The taxpayer's wealth at the end of year 1 (3.-6.)	1806

Scenario 2: The share is sold at the end of year 0 and the revenue is invested in the capital market

8. Revenue from sale of share at the end of year 0 (=2.)	2000
9. Taxable capital gain at the end of year 0 (8.-1.)	1000
10. Tax on capital gain at the end of year 0 (28% of 9.)	280
11. Funds available for investment in bonds at the start of year 1 (8.-10.)	1720
12. The taxpayer's wealth at the end of year 1 (105% of 11.)	1806

We see that the shareholder income tax will neither encourage nor discourage the realization of shares. In a similar way one can show that the tax will not distort the decision to realize a loss. Like the retrospective capital gains tax proposed by Auerbach (1991) and the generalized cash flow tax described by Auerbach and Bradford (2001), the shareholder income tax is neutral towards realization decisions even though tax is due only when assets are realized. As the reader may verify, the rate-of-return allowance is crucial for this neutrality property.

3.3. The shareholder income tax, loss offsets, and risk taking

The numerical examples above abstracted from uncertainty and risk aversion. In an uncertain economic environment with risk averse investors, the neutrality properties of the shareholder income tax will depend crucially on the tax treatment of losses. To ensure the greatest possible degree of neutrality, the Skauge committee proposed a *symmetric* treatment of gains and losses on shares. Just as the shareholder is liable to tax on the excess of his realized return over the after-tax interest rate on government bonds (the RRA), he should be allowed to record a loss for tax purposes if his realized income from shares falls short of his opportunity cost, given by the RRA. Thus the difference between the RRA and the realized return on shares should either be deductible against other current income, or the shareholder should be allowed to carry his 'loss' forward with interest to preserve the present value of the loss offset.

The appendix analyzes the effects of such a symmetric shareholder income tax on the required rate of return on shares when investors are risk averse. The analysis is based on a variant of the Capital Asset Pricing Model, adapted to the context of a small open economy like Norway. The model distinguishes between 'quoted' shares which are traded internationally, and 'unquoted' shares which are only traded in the domestic market. In a small open economy the required return on quoted shares will be given exogenously from the world capital market and will hence be unaffected by a residence-based personal tax on Norwegian shareholders. The question is whether the required return on the *unquoted* shares issued by small and medium-sized domestic companies will also be unaffected by a symmetric shareholder income tax with full loss offsets? If that is the case, the tax will be fully neutral towards corporate investment decisions.

As shown in the appendix, if shareholders have *well-diversified portfolios* in which unquoted shares have a small weight, the required expected after-tax rate of return on unquoted shares (R_u^e) may be approximated by the equation

$$R_u^e = i + \beta \cdot (R_q^e - i) \quad (1)$$

where i is the RRA, i.e., the after-tax rate of interest on risk-free bonds, R_q^e is the required expected after-tax rate of return on quoted shares, and β is the ratio of the covariance between R_u^e and R_q^e to the variance of R_q^e . Thus, the greater the covariance between R_u^e

and R_q^e , i.e., the more the holding of unquoted shares adds to the risk on the shareholder's total portfolio, the greater is the required risk premium on unquoted shares. Let r_u^e og r_q^e denote the required expected *pre-tax* returns on unquoted and quoted shares, respectively, and let t be the rate of shareholder income tax on the equity premia $r_u^e - i$ and $r_q^e - i$. The after-tax expected rates of return will then be given by

$$R_u^e = r_u^e - t \cdot (r_u^e - i) \quad (2)$$

$$R_q^e = r_q^e - t \cdot (r_q^e - i) \quad (3)$$

Substituting (2) and (3) into (1), we get

$$r_u^e = i + \beta \cdot (r_q^e - i) \quad (4)$$

The short-term interest rate i is determined by monetary policy, and the required return r_q^e on quoted shares is exogenously given from the world market. Moreover, if σ_q^2 is the variance of r_q^e and σ_{uq} is the covariance between r_u^e and r_q^e , we have $\beta \equiv \frac{(1-t)^2 \sigma_{uq}}{(1-t)^2 \sigma_q^2} = \frac{\sigma_{uq}}{\sigma_q^2}$, as shown in the appendix. It then follows that the required return on unquoted shares will indeed be unaffected by the shareholder income tax, since t does not appear in (4).

This neutrality result assumes that shareholder portfolios are well-diversified.⁹ In practice the holders of shares in small companies have often invested a large proportion of their equity in a single unquoted company, perhaps because they wish to secure full control of the firm, or because asymmetric information and adverse selection in capital markets make risk sharing with outside investors difficult. In this case of *incomplete diversification* the shareholder income tax will have two offsetting effects on r_u^e . On the one hand the symmetric tax will induce risk-averse shareholders to increase their holdings of quoted shares, because it reduces the volatility of the net rate of return. With a positive covariance between the pre-tax returns on quoted and unquoted shares, the larger holdings of quoted shares means that the holding of unquoted shares adds more to the total risk on the taxpayer's portfolio. This will tend to increase the required risk premium on unquoted shares. On the other hand, the shareholder income tax also reduces the variability of the net return on unquoted shares, and this tends to *reduce* the required risk premium.¹⁰ In the appendix I show that the latter effect will always dominate, unless the returns to the two types of shares are perfectly correlated. Hence the

required return on unquoted shares will generally fall, thereby stimulating real investment in unquoted companies. Note that this non-neutrality is likely to be socially desirable, since one would expect that the owners of small companies are inclined to take too little risk from a social perspective when they have failed to diversify their portfolios.

In summary, when taxpayers have well diversified portfolios, the impact of the shareholder income tax on r_u^e will be negligible, and when the owners of small companies hold a significant part of their equity in the form of unquoted shares in their own company, the tax is likely to *improve* the allocation of risk.

The approximate neutrality of the shareholder income tax relies on the symmetry of the tax: whenever the realized rate of return r_A on some share A falls short of the risk-free after-tax interest rate, the shareholder is entitled to a deduction with a present value equal to $i - r_A$ times the stepped-up basis of the share. To ensure a maximum degree of neutrality and to minimize the amounts to be carried forward, it might seem natural to allow taxpayers to deduct any tax losses on individual shares against current taxable income from other shares as well as against current ordinary income (which is taxed at the same basic rate as shareholder income, according to the committee proposal). The Skauge committee did indeed propose that a realized tax loss from the sale of any individual share should be deductible against current taxable income from other shares in the same year. However, to protect the Norwegian tax base, the committee suggested two mild limitations on loss offsets. First, as long as the taxpayer does not realize share A , he should not be allowed to deduct unutilized RRAs imputed to share A against his income from some other share B . Instead, the unutilized RRA is added to the basis of share A and is thus carried forward with a rate of return equal to the RRA. Second, if the shareholder sells some share A with a tax loss L , he can deduct this loss against any other taxable shareholder income Y in the same year, but if $L > Y$, that part of the remaining loss $L - Y$ which stems from unutilized RRAs should not be deductible against current ordinary income. Instead, these remaining unutilized RRAs should be carried forward and deducted against future shareholder income, with an interest premium equal to the RRA. In the absence of these limitations taxpayers might use RRAs from low-yielding shares to shield current income from high-yielding shares and current income from other sources, and then subsequently move out of Norway before selling their high-yielding

shares at a gain which could no longer be subjected to Norwegian tax.¹¹

The loss offset rules proposed by the Skauge committee ensure that deductions for tax losses preserve their present value and that the taxpayer will always obtain full loss offset provided he earns positive taxable income from shares at some point in the future. But taxpayers who never receive positive future shareholder income in excess of the RRA will not be fully compensated for tax losses stemming from unutilized RRAs. In the eyes of the committee, one has to live with this asymmetry in order to protect the Norwegian tax base. To compensate for this (mild) limitation on loss offsets, the Skauge committee suggested that the RRA should be set equal to the after-tax interest rate on five-year government bonds which normally includes a slight risk premium compared to the risk-free short term interest rate.

3.4. Debt versus equity

The shareholder income tax implies that returns to shares above the going market interest rate will be subject to double taxation, whereas interest on debt will only be taxed once at the ordinary capital income tax rate. This asymmetry might induce companies to distribute their earnings in the form of interest on debt rather than in the form of equity income. Subordinated debt is often a close substitute for equity, and interest on such debt typically includes a substantial risk premium. Hence it may be possible to avoid the shareholder income tax by paying out above-normal rates of return in the form of interest on loans from shareholders to the company.

To discourage substitution of single-taxed debt for double-taxed equity, the Skauge committee therefore proposed that whenever the interest rate on a loan from a personal taxpayer to a company exceeds the RRA plus a risk premium of 2-4 percentage points (to reflect that there is no deduction for the foregone interest income in case of default on the debt), the excess interest income should be subject to the shareholder income tax.

3.5. Distortions to the choice of organizational form?

Since the shareholder income tax can only deal with the problem of income shifting in the *corporate* sector, it is necessary to maintain the income splitting system for sole

proprietorships and partnerships under the Norwegian dual income tax. One may ask whether the different tax treatment of corporate and non-corporate firms will distort the choice of organizational form? Under certain restrictive assumptions, the answer is "no". Specifically, if there are no credit constraints and no risk, and if the total effective tax rate on the labour income of active shareholders equals the effective tax rate on labour income earned by proprietors, the tax system proposed by the Skauge committee will be neutral between the two groups.

This may be illustrated by a simple example. Consider an entrepreneur who invests one unit of capital in his firm. Suppose that this business capital yields a pre-tax return equal to the pre-tax market interest rate r and that the entrepreneur's work effort in the firm generates additional (business) income w . Assume further that all of the after-tax business income is retained in the firm in year 1, and that the entrepreneur sells the firm at the end of period 2. If he organizes his firm as a proprietorship, his imputed capital income under the income splitting system will be r times the stock of business capital at the start of the period. This imputed return will be taxed as capital income at the rate t , while the remaining business income will be taxed as labour income at the rate τ . Denoting the after-tax interest rate by $i \equiv r(1 - t)$, the situation for the proprietor may then be summarized as follows, assuming that the value of the firm at the end of year 2 equals the assets accumulated in the firm at that time:

Scenario 1: The firm is organized as a proprietorship

Year 1

1. Initial capital stock: 1
2. Business income before tax: $r + w$
3. Tax bill: $tr + \tau w$
4. Retained after-tax business income (2.-3.): $i + w(1 - \tau)$

Year 2

5. Initial capital stock (1.+4.): $1 + i + w(1 - \tau)$
6. Business income before tax ($r \times (5.) + w$): $r[1 + i + w(1 - \tau)] + w$
7. Tax bill: $tr[1 + i + w(1 - \tau)] + \tau w$
8. Retained after-tax business income (6.-7.): $(1 + i)[i + w(1 - \tau)]$

9. Revenue from sale of firm (5.+8.): $(1 + i)^2 + (2 + i) w (1 - \tau)$

Suppose alternatively that the firm is organized as a corporation, and assume (in accordance with the Skauge committee's proposal) that the corporate tax rate and the tax rate on shareholder income are both equal to the capital income tax rate t . Since no shareholder income is realized in year 1, and since the entrepreneur sells his share at the end of year 2 at a price equal to the value of the assets accumulated in the firm, his situation will be the following, given that the Rate-of-Return Allowance imputed to the shares equals the after-tax interest rate i :

Scenario 2: The firm is organized as a corporation

Year 1

10. Initial capital stock = initial basis of shares: 1

11. Business income before tax: $r + w$

12. Corporate income tax bill: $t(r + w)$

13. Retained after-tax business income (11.-12.): $i + w(1 - t)$

Year 2

14. Initial capital stock (10.+13.): $1 + i + w(1 - t)$

15. Basis of shares at the start of the year: $1 + i$

16. Business income before tax ($r \times (14.) + w$): $r[1 + i + w(1 - t)] + w$

17. Corporate income tax: $t\{r[1 + i + w(1 - t)] + w\}$

18. Retained after-tax business income (16.-17.): $(1 + i)[i + w(1 - t)]$

19. Capital stock at the end of the year

= revenue from sale of shares (14.+18.): $(1 + i)^2 + (2 + i) w (1 - t)$

20. Basis of shares at the end of the year: $(1 + i)^2$

21. Shareholder income tax ($t \times (19.-20.)$): $t(2 + i) w (1 - t)$

22. Net revenue from sale of shares (19.-21.): $(1 + i)^2 + (2 + i) w (1 - t)^2$

Comparing the net revenues in lines 9. and 22., we see that the entrepreneur will be equally well off under the two organizational forms if $(1 - t)^2 = 1 - \tau$. As the reader may easily verify, this is equivalent to the condition

$$t + t(1 - t) = \tau \tag{5}$$

The magnitude on the left-hand side of (5) is the sum of the corporate tax and the shareholder income tax on labour income earned within a corporation. If this is equal to the tax rate τ on the imputed labour income of proprietors, the tax system will be neutral towards the choice of organizational form. Given the tax rates proposed by the Skauge committee, condition (5) will be roughly met. Note from lines 3. and 12. that since $t < \tau$ under the dual income tax, the proprietor's tax bill is *front-loaded* relative to the tax bill of the owner of a corporation. More generally, the timing of tax payments will differ under the two organizational forms. Hence the tax neutrality result only holds in the absence of liquidity constraints.

But even if there are no credit constraints, the neutrality result breaks down once we allow for risk. When business income fluctuates, the average effective tax rate τ on the proprietor's imputed labour income will vary with the level of income, due to the progressive tax schedule. By contrast, under the corporate organizational form the entrepreneur can engage in averaging of taxable income by appropriate timing of the realization of his shareholder income, thereby exploiting the rate-of-return allowance to the greatest possible extent. Since the proprietor has no similar opportunity for income averaging, he will tend to have a higher average tax rate over time than the active shareholder, even if (5) is met in a 'normal' year. Under risk neutrality the proposed tax system will thus tend to favour the corporate form of organization. With risk aversion the situation becomes more complex, since entrepreneurs must then trade off the additional income insurance offered by the proprietor's progressive tax schedule against the higher average burden of taxation imposed on proprietors relative to active shareholders.

Except in unrealistic circumstances, we see that the combination of the shareholder income tax and the income splitting system for proprietorships will tend to distort the choice of organizational form. As a long run measure, the Skauge committee therefore proposed to replace the income splitting system for proprietors and partnerships by tax rules closely resembling the rules for corporate firms. According to the committee's suggestions, the imputed return to business assets will still be taxed as capital income, but the residual business income will be taxed as labour income only to the extent that

it is distributed from the firm to the owner. Thus residual business income retained in non-corporate firms will only be taxed at the corporate tax rate.¹² Via the timing of retained profits, the owners of non-corporate firms will then be able to engage in income averaging in the same way as active shareholders.

4. The shareholder income tax versus other forms of neutral capital income taxation

The shareholder income tax is based on the familiar idea that a capital income tax which allows a deduction for the opportunity cost of finance will be neutral. It is well known that a corporate income tax which allows corporations a full deduction for true economic depreciation and for the cost of finance leaves the user cost of capital unchanged (see King (1975), for example). In a context without uncertainty, Boadway and Bruce (1984) discovered that this neutrality result also holds when depreciation for tax purposes deviates from true economic depreciation, provided corporations are allowed to deduct an imputed market rate of interest on the remaining book value of the assets recorded in their tax accounts. In that case the current tax saving from accelerated depreciation will be exactly offset by a fall in future rate-of-return allowances of equal present value, so the timing of depreciation allowances will have no effect on the cost of capital.

The Boadway-Bruce neutrality result provided the intellectual foundation for the so-called ACE system (Allowance for Corporate Equity) proposed by the Capital Taxes Group of the Institute for Fiscal Studies (1991) and by Devereux and Freeman (1991). Under this system corporations may deduct an imputed rate of return on their equity along with their interest expenses. The ACE system was actually implemented in Croatia from 1994 to the beginning of 2001 (see Rose and Wiswesser (1998) and Keen and King (2001)), and two government committees recently proposed the ACE as a model for taxing the rents earned in the petroleum sectors in Denmark and Norway (see Lund (2002a)).

While Boadway and Bruce (1984) abstracted from risk, the contributions by Fane (1987) and Bond and Devereux (1995) showed that the Boadway-Bruce neutrality result carries over to a setting with uncertainty. A main point made in these contributions is that even though other corporate cash flows are risky, the allowance for corporate equity

should be equal to the risk-free rate of interest, provided the deduction is perfectly certain. This is a parallel to the result derived in the appendix that a shareholder income tax with an RRA equal to the risk-free interest rate will ensure (approximate) investment neutrality.

Policy makers have had difficulties understanding why a rate-of-return allowance for equity should not include a risk premium, given that the equity premium observed in the stock market is on average positive and quite substantial. Following Lund (2002a and 2002b, pp. 483-484), we may explain this seemingly counterintuitive result as follows. We know that the *cash flow tax* proposed by Brown (1948) and many others is neutral even under uncertainty, because it effectively makes the government a silent partner in all investment projects, sharing symmetrically in all gains and losses.¹³ A cash flow tax allows full expensing of investment, generating an immediate tax reduction equal to the tax rate τ times the investment outlay K . Alternatively one might allow investors to deduct in all future periods a rate of return RRA on the initial investment outlay. If the future tax reductions due to the rate-of-return allowances accrue with certainty, they should be discounted at the risk-free interest rate i . Hence their net present value will be $NPV = \tau RRA \cdot K / i$. If we set $RRA = i$, we then get $NPV = \tau K$, indicating that a rate-of-return allowance equal to the risk-free rate is sufficient to ensure equivalence with the neutral cash flow tax, even if the other cash flows associated with the investment are uncertain. As this reasoning shows, the key to the determination of the deductible rate of return is the degree of certainty with which the reductions in future tax occur. If the tax savings are not quite certain due to limitations on loss offsets, there is a case for including a risk premium in the RRA, but in principle the size of that premium should reflect the uncertainty attached to the value of the deduction and *not* the uncertainty associated with the other cash flows of the firm.

While previous writers have proposed that a rate-of-return allowance be granted at the *corporate* level based on the asset values recorded in corporate tax accounts, a main innovation of the shareholder income tax suggested in this paper is that the RRA is granted at the level of *domestic personal shareholders*, based on the (stepped-up) value of their shareholdings. There are two separate policy choices involved here. The most fundamental choice is whether to offer the allowance to corporations or to shareholders.

If the allowance is granted to shareholders, the second choice is whether the basis for the allowance should be the book value of corporate assets or the value of the shares.

There were two main reasons why the Norwegian tax reform committee did not recommend an equity allowance at the corporate level. First, an ACE system is a form of progressive corporate income tax imposing a relatively high average tax rate on highly profitable firms, especially if the corporate tax rate on taxable profits has to be raised in order to offset the revenue loss from the rate-of-return allowance. Highly profitable firms are often multinationals which bring important intangible assets to the countries where they invest, and it was not deemed to be in Norway's interest to introduce a tax system that might deter such investors.¹⁴ Second, for Norwegian subsidiaries of parent companies headquartered in countries offering a foreign tax credit for corporate taxes paid in Norway, the rate-of-return allowance would not stimulate the incentive to invest in Norway but would just transfer revenue from the Norwegian to the foreign governments.

The Skauge committee therefore came down in favour of double tax relief at the shareholder level. The committee was aware that a rate-of-return allowance to Norwegian residents will not significantly affect the cost of equity finance for widely held companies whose shares are traded internationally, but as already mentioned it felt that an allowance is needed to avoid distortions to the cost of equity finance for small and medium-sized companies without access to the international stock market (see the appendix for a theoretical justification of this view).

When the allowance is granted to shareholders rather than corporations, it seems most natural to calculate it on the basis of share values rather than imputing a proportion of the value of corporate assets to each individual shareholder. To be sure, the latter procedure would have the advantage of offsetting the distortions to investment decisions implied by deviations between true economic depreciation and depreciation for tax purposes, as Boadway and Bruce (1984) pointed out. On the other hand, the assets recorded in corporate tax accounts often do not include the firm's intangible assets, whereas the value of intangibles will be reflected in the shareholder's acquisition price when he buys a share. The recorded acquisition prices of shares thus provide a broader and potentially more neutral basis for calculating the RRA. Moreover, if double tax relief were based on corporate book values, it would be very difficult to require foreign companies to provide

the information on asset values necessary for calculating the RRAs for Norwegian holders of foreign shares. In practice the rate-of-return allowance would then only be granted to holders of domestic shares, but this might violate Norway's international obligation not to impose tax obstacles on the free flow of capital between Norway and the EU. By contrast, it should be easier for Norwegian taxpayers to document the acquisition price of their foreign shares for the purpose of obtaining the RRA.

In summary, the shareholder income tax recently suggested by the Norwegian tax reform committee has a number of attractive neutrality properties, compared to other proposed solutions to the problems of income shifting and double taxation of corporate equity income. Time will tell whether these attractions are sufficient to persuade policy makers in Norway and elsewhere to adopt the shareholder income tax.

APPENDIX

SHAREHOLDER INCOME TAXATION IN A SMALL OPEN ECONOMY

This appendix analyzes the effects of shareholder income taxation on the required returns to shares in a small open economy. The same issue was studied by Apel and Södersten (1999), but while they used a mean-variance framework and did not consider the effects of a rate-of-return allowance (RRA), I will use a variant of the Capital Asset Pricing Model to derive the effects of a shareholder income tax with and without an RRA.

The model

Like Apel and Södersten, I distinguish between shares which are traded in the international stock market ('quoted shares') and shares which are only traded domestically ('unquoted shares'). The representative investor invests a fraction v_u of his initial wealth V_o in unquoted shares yielding an uncertain after-tax rate of return R_u , while placing a fraction v_q of his wealth in quoted shares at a risky net rate of return R_q . The remaining fraction of initial wealth is invested in risk-free bonds paying an after-tax interest rate i . The investor's wealth V at the end of the period will then be

$$V = [1 + v_u R_u + v_q R_q + (1 - v_u - v_q) i] V_o \quad (\text{A.1})$$

yielding utility $U(V)$, where $U' > 0$ and $U'' < 0$. Taking a second-order Taylor expansion of the utility function around the *expected* end-of-period wealth V^e , we have

$$U(V) \approx U(V^e) + U' \cdot (V - V^e) + \frac{U''}{2} \cdot (V - V^e)^2 \quad (\text{A.2})$$

From (A.1) and (A.2) it follows that the expected utility of the investor's end-of-period wealth is approximately given by

$$\begin{aligned} E[U(V)] &= U(V^e) + \frac{U''}{2} \cdot (V - V^e)^2 \\ &= U([1 + v_u R_u^e + v_q R_q^e + (1 - v_u - v_q) i] V_o) + \frac{U''}{2} \cdot (v_u^2 \hat{\sigma}_u^2 + v_q^2 \hat{\sigma}_q^2 + 2v_u v_q \hat{\sigma}_{uq}) \end{aligned} \quad (\text{A.3})$$

where R_u^e and R_q^e are the expected net rates of return on unquoted and quoted shares, respectively; $\hat{\sigma}_u^2$ and $\hat{\sigma}_q^2$ are the variances of these rates of return, and $\hat{\sigma}_{uq}$ is their covariance. Given the expected rates of return and the risk characteristics of the three asset types, the investor chooses his portfolio shares v_u and v_q so as to maximize his expected utility. From (A.3) one finds that the first-order conditions for the solution to this problem may be written as

$$R_u^e = i + \rho V_o (v_u \hat{\sigma}_u^2 + v_q \hat{\sigma}_{uq}) \quad (\text{A.4})$$

$$R_q^e = i + \rho V_o (v_q \hat{\sigma}_q^2 + v_u \hat{\sigma}_{uq}) \quad (\text{A.5})$$

where $\rho \equiv -U''/U'$ is the coefficient of absolute risk aversion.

A shareholder income tax without a rate-of-return allowance

Suppose the government levies a symmetric residence-based personal tax at the rate t on all returns to shares. If r_j and r_j^e are the actual and expected pre-tax returns to shares of type j , we then have

$$R_j = (1 - t) r_j, \quad R_j^e = (1 - t) r_j^e, \quad j = u, q \quad (\text{A.6})$$

$$\widehat{\sigma}_j^2 \equiv E \left[(R_j - R_j^e)^2 \right] = (1 - t)^2 \sigma_j^2, \quad j = u, q \quad (\text{A.7})$$

$$\widehat{\sigma}_{uq} \equiv E \left[(R_u - R_u^e) (R_q - R_q^e) \right] = (1 - t)^2 \sigma_{uq} \quad (\text{A.8})$$

where σ_j^2 and σ_{uq} are the variances and the covariance of the *pre-tax* rates of return, respectively. Inserting (A.6) through (A.8) into (A.4) and (A.5), we find

$$r_u^e = \frac{i}{1 - t} + \rho(1 - t) V_o (v_u \sigma_u^2 + v_q \sigma_{uq}) \quad (\text{A.9})$$

$$r_q^e = \frac{i}{1 - t} + \rho(1 - t) V_o (v_q \sigma_q^2 + v_u \sigma_{uq}) \quad (\text{A.10})$$

The required expected rate of return r_q^e on quoted shares is exogenously given from the world market and hence unaffected by the shareholder income tax. To see how the tax affects the required expected return r_u^e on unquoted shares, we solve (A.10) for $\rho(1 - t) V_o$ and insert the result into (A.9) to get

$$r_u^e = (1 - \widetilde{\beta}) \left(\frac{i}{1 - t} \right) + \widetilde{\beta} r_q^e, \quad \widetilde{\beta} \equiv \frac{v_u \sigma_u^2 + v_q \sigma_{uq}}{v_q \sigma_q^2 + v_u \sigma_{uq}} \quad (\text{A.11})$$

The variable $\widetilde{\beta}$ in (A.11) may be either smaller or greater than unity, so a shareholder income tax without a rate-of-return allowance will not necessarily drive up the required return on unquoted shares, as already pointed out by Apel and Södersten (1999). To provide some intuition for this result, consider an investor with a well-diversified portfolio where unquoted shares carry a relatively small weight. In this case where $v_u \rightarrow 0$, it follows from the definition given in (A.11) that $\widetilde{\beta} \rightarrow \sigma_{uq}/\sigma_q^2$. The variance of the return on the 'market portfolio' tends towards σ_q^2 when $v_u \rightarrow 0$. Our variable $\widetilde{\beta}$ then becomes roughly equal to the 'beta' known from the conventional Capital Asset Pricing Model. For unquoted shares with a relatively high covariance with the market portfolio ($\widetilde{\beta} > 1$), the required risk premium will be high, because the holding of such shares adds to the aggregate risk on the investor's portfolio. For such risky shares the benefit from the income insurance offered by a symmetric shareholder income tax (with full loss offset) outweighs the fact that the tax reduces the average net rate of return relative to the net return on safe assets. Accordingly, we see from (A.11) that the tax will *reduce* the required

return on unquoted shares when $\tilde{\beta} > 1$. Conversely, for unquoted shares with a relatively low $\tilde{\beta}$ (< 1), the tax will drive up the required return. Thus a shareholder income tax without a rate-of-return allowance will tend to stimulate investment in companies whose profits vary strongly with the business cycle, at the expense of investment in companies with a low sensitivity to the cycle.

Introducing a rate-of-return allowance

Consider next a shareholder income tax levied only on the *equity premium*, defined as the excess of the rate of return on shares over the after-tax interest rate on risk-free bonds. In this case the actual and expected after-tax returns on shares will be

$$R_j = r_j - t(r_j - i), \quad R_j^e = r_j^e - t(r_j^e - i), \quad j = u, q \quad (\text{A.12})$$

whereas the variances and the covariance of the net rates of return will still be given by (A.7) and (A.8), as the reader may easily verify. Substitution of (A.7), (A.8) and (A.12) into (A.4) and (A.5) then yield

$$r_u^e = i + \rho(1-t)V_o(v_u\sigma_u^2 + v_q\sigma_{uq}) \quad (\text{A.13})$$

$$r_q^e = i + \rho(1-t)V_o(v_q\sigma_q^2 + v_u\sigma_{uq}) \quad (\text{A.14})$$

Two neutrality results

It follows directly from (A.13) and (A.14) that a shareholder income tax with an RRA will have no impact on the required return to unquoted shares in the absence of uncertainty ($\sigma_u^2 = \sigma_{uq}^2 = 0$) or when investors are risk-neutral ($\rho = 0$). This confirms the neutrality result illustrated by our numerical example in section 3.2.

In the presence of uncertainty and risk aversion, we find by substituting (A.14) into (A.13) that

$$r_u^e = i + \tilde{\beta} \cdot (r_q^e - i) \quad (\text{A.15})$$

where $\tilde{\beta}$ is defined in (A.11). Recall that when portfolios are well-diversified, we have $\tilde{\beta} \rightarrow \sigma_{uq}/\sigma_q^2$. Thus it follows from (A.15) that a shareholder income tax with a rate-of-return allowance will have a negligible impact on the required return on unquoted shares

when these shares only carry a small weight in investor portfolios. This is the basis for the claim made in this paper that the tax will be approximately neutral when investors are well-diversified.

Note that the neutrality result in (A.15) does not require the coefficient of absolute risk aversion (ρ) to be constant. However, in the analysis below we will make the simplifying assumption that ρ is indeed constant.

General equilibrium

To analyze the case where investors are less well diversified, it is useful to move from the level of the individual investor to the macro level. If K is the aggregate capital stock invested in unquoted companies at the start of the period; π is the rate of profit on this capital stock (after payment of corporation tax), and q is the ratio of the market value to the replacement value of the capital stock (Tobin's average q for unquoted companies), we have

$$r_u = \frac{\pi}{q}, \quad r_u^e = \frac{\pi^e}{q} \quad (\text{A.16})$$

$$\sigma_u^2 \equiv E [(r_u - r_u^e)^2] = \frac{\sigma_\pi^2}{q^2}, \quad \sigma_{\pi q} \equiv E [(r_u - r_u^e)(r_q - r_q^e)] = \frac{\sigma_{\pi q}}{q} \quad (\text{A.17})$$

where σ_π^2 is the variance of π , $\sigma_{\pi q}$ is the covariance between π and r_q , and π^e is the expected profit rate. The specification of r_u in (A.16) assumes that corporate profits generate shareholder income either in the form of dividends or in the form of capital gains on shares. At the macro level we have $v_u \equiv qK/V_o$ and $v_q \equiv S_q/V_o$, where S_q denotes the aggregate stock of quoted shares held by domestic residents. Using these definitions along with (A.16) and (A.17), we may rewrite (A.13) and (A.14) as

$$\pi^e = iq + \rho(1-t)(K\sigma_\pi^2 + S_q\sigma_{\pi q}) \quad (\text{A.18})$$

$$r_q^e = i + \rho(1-t)(S_q\sigma_q^2 + K\sigma_{\pi q}) \quad (\text{A.19})$$

In the short run considered here, the initial capital stock in unquoted companies is predetermined. Moreover, π^e is given by the state of expectations, i is determined by

monetary policy, and r_q^e is exogenously given from abroad. However, even in the short run investors can adjust their aggregate holdings of quoted shares by buying or selling in the international stock market. Equation (A.19) then determines the equilibrium value of S_q , and subsequently we may insert the solution for S_q into (A.18) to find the short run equilibrium value of q (and hence the value of $r_u^e \equiv \pi^e/q$). If a rise in the tax rate t reduces the value of q , it will drive up r_u^e , thereby reducing the real investment activity of unquoted companies over time. Using (A.1), (A.16) through (A.19) and the formula for the coefficient of correlation c , one can show that

$$\frac{dr_u^e}{dt} = -\frac{r_u^e}{q} \cdot \frac{dq}{dt} = \left(\frac{v_u r_u^e \tilde{\rho} \sigma_u^2}{i(1+R^e)} \right) (c^2 - 1) \leq 0, \quad (\text{A.20})$$

$$v_u \equiv qK/V_o, \quad \tilde{\rho} \equiv \rho V^e, \quad R^e \equiv v_u R_u^e + v_q R_q^e + (1 - v_u - v_q) i, \quad c \equiv \frac{\sigma_{uq}}{\sigma_q \sigma_u}$$

where $\tilde{\rho}$ is the coefficient of relative risk aversion, measured at the representative investor's level of expected end-of-period wealth; and R^e is the average expected after-tax rate of return on the aggregate portfolio held by domestic investors. Since the coefficient of correlation c cannot exceed 1 numerically, the expression in (A.20) is non-positive and generally negative. Thus the shareholder income tax will generally tend to reduce the required return to unquoted shares, as we explained in section 3.3. However, note that (A.20) is consistent with our earlier neutrality result: if the market value of the assets invested in unquoted firms is small relative to aggregate investor wealth so that v_u is close to zero, dr_u^e/dt will also be close to zero, and the shareholder income tax will be approximately neutral towards real investment decisions.

NOTES

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1. Combining OECD Revenue Statistics and National Accounts, Carey and Rabesona (2002) estimate average effective tax rates on capital income and labour income. They find that in many countries preferential tax arrangements for household capital income significantly reduce the overall effective tax rate on income from capital while increasing the estimated effective tax rate on labour income.
2. The Nordic countries also include most social security transfers in the base for the progressive surtax.
3. Andersson et al. (1998) provide more details on the ambitious business tax reforms in Norway and the other Nordic countries in the early 1990s.
4. While this paper focuses only on Norway, Hagen and Sørensen (1998) and Lindhe, Södersten and Öberg (2001) offer a comparative analysis of the taxation of firms with active owners in the various Nordic countries.
5. The empirical study by Fjærli and Lund (2001) indicates that the desire to minimize tax bills has had a strong effect on the form in which active owners of Norwegian corporations have chosen to take out cash from the firm.
6. The proposed shareholder income tax is in fact rather similar to the current *Swedish* tax rules for holders of shares in companies which are not listed on the stock exchange. However, because the Swedish tax rules favour unquoted companies relative to quoted companies, they are non-neutral towards real investment incentives, in contrast to the proposal described in this paper. See Sørensen (2003) for an analysis of the Swedish rules compared to the rules proposed for Norway.
7. This is reasonable: as long as retentions do not trigger any current capital gains tax and do not generate any future dividend tax at the time of distribution, there will be no tax capitalization effects on share values.
8. For the moment, we are implicitly assuming risk neutrality or abstracting from uncertainty. We will deal with uncertainty and risk aversion in the next section.
9. In a model of a *closed* economy with well diversified consumers, Gordon (1985) also finds that a capital income tax which exempts the risk free rate of return will be neutral, provided tax revenues are transferred back to taxpayers in a lump sum manner. By contrast, the neutrality result in the open-economy model set up in Sørensen (2003) implicitly assumes that tax revenues are used to finance public goods which enter in-

vestor utility functions in an additively separable manner. On this assumption Gordon's closed-economy model would predict that a symmetric tax on the equity premium will *stimulate* investment in risky assets by reducing uncertainty regarding private consumption possibilities.

10. This tendency of a symmetric tax on the equity premium to stimulate risk taking is well known from the literature. See Sandmo (1977 and 1989).

11. The committee's proposals imply that separate accounts must be kept for each of the taxpayers' shares in each company. For such a system to be manageable, it must be based on a central shareholder register recording the acquisition and sale of shares and the payment of dividends by companies. With such a register, which was already planned in Norway before the tax reform committee was established, the tax liability on each share may be calculated on a computerized basis.

12. In Denmark and Sweden similar tax rules for proprietors already exist.

13. The neutrality of the cash flow tax holds only when the tax rate is constant over time, as stressed by Sandmo (1979). Neutrality also requires that the investor's function for valuation of risky cash flows satisfies the property of value additivity, as defined by Fane (1987). Value additivity holds for any valuation model in financial theory such as the CAPM, the APT, and option valuation models.

14. This is essentially the critique raised by Bond (2000) against the ACE system. Similar concerns seem to have put an end to the recent Italian experiment with a progressive (dual) business income tax. See Bordignon, Giannini and Panteghini (2001) for a discussion of the Italian dual business income tax.

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