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Taxation of Capital Gains of Individuals

POLICY CONSIDERATIONS AND APPROACHES

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ENJEUX ET MÉTHODES

N° 14

Foreword

This report releases the findings of a project undertaken with Delegates of Working Party No. 2 of the OECD Committee on Fiscal Affairs, investigating policy considerations in the tax treatment of capital gains of individuals and alternative design features of capital gains tax provisions, with a focus on the 'pure domestic' case (capital gains/losses of resident taxpayers on domestic assets). The exercise involved a review of capital gains tax issues highlighted in the public finance literature, discussion of Member country perspectives on these and other issues reported in questionnaire responses received from 20 OECD countries participating in the project, and the preparation of descriptive information on aspects of capital tax rules presented in summary tables in the report covering all OECD countries.

The study first addresses policy considerations highlighted by countries participating in the questionnaire exercise as central to decision-making over the tax treatment of capital gains of individuals: securing tax revenues; efficiency considerations including 'lock-in' effects; horizontal and vertical equity goals; encouraging savings and investment; and limiting taxpayer compliance and tax administration burdens. The review in this part concentrates largely on issues related to tax base protection and lock-in effects, given the attention to these issues in the questionnaire responses and the number of considerations raised, including possible disincentives to portfolio diversification and distortions to the allocation of productive capital and associated efficiency losses.

The study then reviews two policy considerations identified by a number of participating countries as important, where the investigation of possible capital gains tax effects is relatively complex and where reliance may be made on various analytical frameworks (economic models) to help guide policy thinking. In particular, this part of the study addresses possible influences of capital gains taxation on risk-taking by individuals (portfolio allocation between safe and risky assets), and on the cost of capital of firms and corporate financial policy. The analysis of risk-taking emphasizes potential discouraging effects of restrictive capital loss offset rules, while the analysis of possible effects on the cost of capital and firm financial policy points to the dependence of results on the tax treatment of the 'marginal shareholder'.

The questionnaire responses identified numerous issues in the design of capital gains tax rules shaping their coverage, application and ultimate impact on tax revenues, the sharing of the tax burden across taxpayer groups, portfolio diversification and risk-taking in the economy, the cost of capital and financial policies of firms, as well as the allocation and level of investment. Design dimensions addressed in the paper include: realization- versus accrual-based taxation; applicable tax rates under personal income tax or a separate capital gains tax; treatment (ring-fencing) of losses; same asset and replacement asset rollover provisions; the treatment of gains on a principal residence; and treatment of the inflation component of capital gains. While outside the ambit of the project, the report briefly reports on the treatment of gains on domestic assets held by non-residents; and transitional considerations.

This report has been prepared by W. Steven Clark, Head, Horizontal Programmes Unit, OECD Centre for Tax Policy and Administration, drawing on information and comments received from Delegates of Working Party No. 2 of the OECD Committee on Fiscal Affairs. The report is published under the responsibility of the Secretary-General.

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Executive Summary

This report releases the findings of a project undertaken with Delegates of Working Party No. 2 of the OECD Committee on Fiscal Affairs, investigating policy considerations in the tax treatment of capital gains of individuals and alternative design features of capital gains tax provisions. The exercise involved a review of a number of issues explored in the public finance literature – including 'lock-in' effects of capital gains taxation; effects of capital gains taxation on risk-taking; and effects on the cost of capital and corporate financial policy – and consideration of OECD member country perspectives on these as well as other issues reported in responses to a capital gains tax questionnaire issued to Delegates.

The questionnaire was also used to gather information on rules in Member countries governing the tax treatment of capital gains of individuals. To keep the international comparison manageable, the review concentrates on the 'pure domestic' case (domestic investors earning capital gains on domestic assets). Questionnaire responses were received from 20 OECD Member countries: Australia, Canada, Czech Republic, Denmark, Finland, Germany, Iceland, Ireland, Italy, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Portugal, Slovak Republic, Spain, Sweden, the United Kingdom, and the United States (hereafter, 'participating countries'). Summary descriptive information on capital gains tax systems for all OECD countries is presented in a set of tables included in this report.

The study first addresses policy considerations highlighted by participating countries as central to decision-making over the tax treatment of capital gains of individuals: securing tax revenues; efficiency considerations including 'lock-in' effects; horizontal and vertical equity goals; encouraging savings and investment; and limiting taxpayer compliance and tax administration burdens. The review in this part concentrates largely on issues related to lock-in effects, given the attention to this aspect in responses to the questionnaire and the number of considerations raised, including possible disincentives to portfolio diversification and distortions to the allocation of productive capital and associated efficiency losses.

The study then reviews two policy considerations identified by a number of participating countries as important, where the investigation of possible capital gains tax effects is relatively complex and where reliance may be made on various analytical frameworks (economic models) to help guide policy thinking. In particular, this part of the study addresses possible influences of capital gains taxation on risk-taking by individuals (portfolio allocation between safe and risky assets), and on the cost of capital of firms and corporate financial policy. The analysis of risk-taking emphasizes potential discouraging effects of restrictive capital loss offset rules, while the analysis of possible effects on the cost of capital and firm financial policy points to the dependence of results on the tax treatment of the 'marginal shareholder'.

The questionnaire responses identified numerous issues in the design of capital gains tax rules influencing their application and ultimate impact on tax revenues and the sharing of the tax burden across taxpayer groups, on portfolio diversification and risk-taking in the economy, and on the cost of capital for investment and the financial and distribution policies of firms. Design dimensions addressed in the study include: realisation- versus accrual-based taxation; applicable tax rates under personal income tax or a separate capital gains tax; treatment (*e.g.* ring-fencing) of losses; rollover provisions; treatment of gains on a taxpayer's principal residence; treatment of the inflation component of capital gains; treatment of gains on domestic assets owned by non-residents; and lastly, transitional considerations.

Tables 1.1, 2.1 and 3.2, appearing in Chapters 1, 2 and 3 of the publication compare in summary form various aspects of the tax treatment of capital gains and losses of individuals in OECD countries, as of 1 July 2004. Three annexes elaborating the more technical issues addressed in the publication are included at the end of the report.

Central Tax Policy Considerations in the Treatment of Capital Gains

The capital gains tax questionnaire asked countries to identify the central or primary considerations factoring into the policy decision of whether (and how) to tax capital gains of individuals, with a focus on the pure domestic case – that is, capital gains/losses on domestic property, accruing to resident individual taxpayers.

A possible starting point when addressing the question of how to treat capital gains is to consider the economic concept of comprehensive income. A comprehensive (Haig-Simons) definition of income, measuring the increase in a taxpayer's ability to pay tax, makes no distinction between income on revenue account (business income) and income on capital account (capital income). Under a comprehensive income benchmark, it follows that households would be subject to tax on gains accruing on the disposition of financial and real property, regardless of whether such gains are 'speculative', in the nature of business income, or are passive, in the nature of capital income.

Fully taxing income on a comprehensive basis including accrued capital gains would be consistent with goals of economic efficiency and horizontal and vertical equity, and may help government meet its revenue objectives. However, from this starting point, various other considerations must be taken into account. The questionnaire responses identify five central considerations factoring into policy-makers' decisions of whether to tax, and if so how to tax, capital gains of individuals, summarized below.

Securing tax revenues

In the absence of broad-based taxation of capital gains imposed under a country's personal income tax or a separate capital gains tax, capital gains of households generally would not be taxed unless gains of a given type are targeted in the tax code, or the tax administration and/or tax courts rule that certain types of gains should be considered as ordinary income and subject to tax. Where capital gains may be realized tax-free, taxpayers can be expected to take one or more steps to convert taxable income into exempt capital gains in order to avoid taxation.

Of the responding countries, those that comprehensively tax capital gains (Australia, Canada, Denmark, Finland, Iceland, Ireland, Italy, Norway, Slovak Republic, Spain, Sweden, the U.K. and the U.S.) identify protection of the tax base as a key objective of

their legislation. Taxing rather than exempting capital gains counters incentives to characterize or convert taxable ordinary income (*i.e.*, wages and salaries) and investment income (*e.g.*, interest, dividends, rents) into tax-exempt capital gains.

Australia notes for example that prior to the introduction of its capital gains tax legislation, opportunities for tax planning to convert income receipts or characterize them as capital gains occurred frequently, and the distinction between income and capital for tax purposes was an important policy concern, one addressed with the introduction of a comprehensive capital gains tax in Australia in 1985.

While taxation of capital gains counters tax avoidance incentives, it may not eliminate them, depending on the tax rate structure applied to capital gains and other income. In Spain, for example, while short-term capital gains are taxed as ordinary income and subject to progressive tax rates, long-term net capital gains are taxed at a proportional (flat) tax rate of 15%. As a result, tax-sheltering activities are reported by Spain as being observed on a regular basis with the creation of financial instruments designed to transform income taxed at progressive rates into long-term capital gains. Spain is not alone, amongst other countries comprehensively taxing capital gains, in having to contend with tax-arbitrage opportunities driven by tax rate differentials across different income types and capital gains, with Iceland, Ireland, Norway and Sweden all reporting similar problems.

In addition to protecting the tax base by countering tax avoidance strategies, the introduction of a comprehensive capital gains tax collects tax revenues on *bona fide* capital gains part of a comprehensive measure of income. This policy consideration together with the intention to reduce incentives to convert taxable income into tax-free gains is a major reason cited by the U.K. for taxing capital gains. In the case of the U.S., capital gains have been considered to be income and thus have been taxed since the beginning of the U.S. individual income tax in 1913. Ireland explains that its capital gains tax was introduced to not only address equity concerns, but to also raise tax revenue, with the absence of capital gains tax seen as a 'lacuna' in the tax system prior to 1974 when only certain capital gains were liable to corporate or personal income tax.

Australia points out that a comprehensive approach may be more successful than relying on selective provisions to draw certain capital gains into the tax net. New Zealand takes the view that the introduction of a comprehensive capital gains tax would be unlikely to generate significant tax revenues, at least in the New Zealand case. One reason is that, with shareholder imputation credits dependent on the amount of corporate income tax paid on distributed profit, a significant amount of capital gains that would be explicitly taxed at the corporate level under a comprehensive regime is currently effectively taxed at the shareholder level when gains realized at the corporate level are distributed in the form of dividends. Also numerous tax deferral opportunities would present themselves under a realisation-based system, with uncertainty over the application of sometimes arbitrary distinctions between what does and does not constitute a realisation event triggering taxation, and uncertainty over what does and does not qualify for rollover relief, under the assumption that rollover provisions extending deferral would be on order, as they are in most systems taxing capital gains.

New Zealand therefore follows a targeted approach, with specific provisions in place to tax as personal income certain gains that would otherwise be treated as income on capital account and thus tax-free. Examples include gains on the sale of personal property where the taxpayer is a dealer in such property; gains on the sale of land

acquired with the intention of resale; and gains on domestic corporate bonds taxed on an accrual basis.

Similarly for other countries participating in the questionnaire that do not comprehensively tax capital gains (Czech Republic, Germany, Luxembourg, Mexico, the Netherlands, and Portugal), the policy desire to tax gains on financial assets held as business assets (part of business profit), tax 'speculative' gains in the nature of business income, and to address avoidance opportunities, motivates the taxation of certain gains of households.

In Germany, for example, capital gains on securities are regarded as 'speculative profit', in the nature of business (trading) income, and subject to tax where the securities are held for less than one year. In the Czech Republic and Luxembourg, the threshold period is 6 months. As regards real assets held as part of private wealth, the holding period threshold is 2 years in Luxembourg, and 10 years for Germany. In these country examples, capital gains on non-business financial assets held for longer than the threshold period are exempt, unless (in the case of Germany and Luxembourg) they represent a substantial shareholding, where tax applies to counter tax avoidance strategies aimed at converting taxable income into tax-exempt capital gains.

Similarly, the Netherlands taxes capital gains on substantial interests (5% participation and above) in equity shares, and gains on assets which are made available to closely-related entrepreneurs or companies. Additionally, the 'box 3' system in the Netherlands, which taxes income from savings by taxing an assumed (notional) yield of 4% on average net capital assets of households – meant to proxy actual returns in the form of some combination of current period payout plus capital appreciation – directly counters tax planning incentives to artificially convert taxable income into a tax-preferred form.

Efficiency considerations including 'lock-in' effects

Efficiency considerations were identified in the questionnaire responses as central to policy decisions over whether and how to tax capital gains of households. One consideration is that exempting capital gains from taxation may distort portfolio investment decisions of households in favour of assets generating tax-exempt capital gains, which may give rise to policy concern – in particular, where capital gains assets (assets generating capital gains/losses) are generally more risky than other assets, implying a tax distortion encouraging risk-taking above levels consistent with tax neutrality.

Taxing capital gains at the same effective rate imposed on other investment returns may avoid this type of distortion. However, accrual taxation is difficult on a number of counts. Valuation problems may be met in assessing current market values of capital gains assets held by investors. Taxing accrued but unrealized gains may also introduce liquidity problems for taxpayers with insufficient cash-flow to cover the tax burden. Moreover, providing investors with the cash value of accrued losses in excess of accrued gains required for symmetric treatment of accrued gains/losses may be viewed as problematic.

Thus, with few exceptions, capital gains of households tend to be taxed on a realization basis, with tax on accrued gains deferred until the year of asset disposition. However this approach of deferring tax on capital gains until realization introduces certain other difficulties. Taxing capital gains/losses on a realization basis encourages the

selling of loss-making assets to obtain current tax relief on loss deductions, while also encouraging investors to hold onto assets with accumulated gains to defer tax liability on them.

Indeed, a main policy consideration emphasised in the country responses is that deferred taxation under a realization-based system can create 'lock-in' effects distorting decisions over asset sales – that is, tax-driven incentives to hold onto assets with accumulated unrealised gains to benefit from tax deferral, rather than sell and unlock capital for investments that would be chosen absent tax considerations. Lock-in effects may result in sub-optimally diversified portfolios, with investors not adjusting their portfolios to compositions that would be chosen in the absence of tax, where the value placed on the reduced level of risk accompanying a more efficiently diversified portfolio does not fully compensate for the additional capital gains tax burden triggered by the sale of capital gains assets. Such distortions may impose a social cost, as there are net gains to society from optimal portfolio diversification.

Lock-in may also distort the allocation of productive capital and constrain financing of profitable investment, implying reduced national income, at least in certain cases. An efficiency loss of this type would be less likely if information on investment opportunities is widely available and access to capital markets is open, or if potential investors include tax-exempt institutions and other tax-sheltered investors for whom lock-in incentives generally do not arise. But if capital market imperfections or impediments exist that restrict the financing of investments paying pre-tax rates of return in excess of those generated by locked-in assets, economic rents may not be realized in certain cases, implying welfare losses.

Another form of lock-in may be created by capital gains tax deferral that lowers the effective shareholder tax rate on capital gains. A low effective capital gains tax rate, compared with the effective tax rate on dividends, may distort corporate distributions policy, encouraging corporations to reinvest profits rather than distribute them – a 'corporate lock-in' effect. Corporate lock-in may carry negative efficiency implications where funds are reinvested in assets with inferior risk/return profiles compared with alternative investments outside the firm.

Thus, exempting capital gains may give rise to tax distortions favouring capital gains assets and encourage risk-taking beyond levels consistent with tax neutrality. But taxing capital gains under a realization-based system introduces 'lock-in' effects and related inefficiencies. Additionally, lock-in may reduce tax revenues as taxpayers defer realizations and potentially avoid tax on unrealized gains at death, depending on the treatment of gains at death. Ireland notes, by way of illustration, that a significant increase in tax yield followed the reduction in 1998 of the capital gains tax rate from 40 to 20%. Reduced lock-in incentives accompanying the rate reduction contributed to an increase in yield from roughly 245 million euros in 1998, to 1,436 million euros in 2003.

The questionnaire responses reveal that lock-in effects under realization-based approaches to taxing capital gains are regarded as a significant concern and deterrent in a number of OECD countries. New Zealand and the Netherlands, for example, avoid realization-based taxation of capital gains, except in certain specific cases (*e.g.* certain gains deemed business income), largely on account of inefficiencies surrounding lock-in . Dutch officials explain that part of the rationale for adoption of the 'box 3' method in the Netherlands, which taxes on a modified accrual basis a notional yield on net capital assets, was to avoid lock-in incentives present under deferred taxation. As noted

previously, certain other countries such as the Czech Republic and Portugal exempt 'non-speculative' gains to avoid lock-in incentives.

Australia, Denmark, Norway, Spain, Sweden, the U.K. and the U.S. all identify as a key objective in taxing capital gains, the neutrality goal of avoiding tax-driven incentives to invest in portfolio assets that pay returns in the form of tax-exempt capital gains. For these countries, as well as Canada, Finland, and Italy, lock-in effects from realization-based taxation were identified as being of some concern, but not significant enough to discourage comprehensive taxation of capital gains – albeit typically with targeted or general tax relief. Advantages of taxing capital gains (*e.g.* raising and protecting tax revenue, avoiding distortions that can arise when dividends are taxed but capital gains are not, and contributing to vertical and horizontal equity) generally were judged as being more important on balance than efficiency losses from lock-in.

Options to eliminate lock-in under a realization-based system by accrual-equivalent taxation, for example by charging interest on deferred capital gains tax, were judged by the U.K and presumably others to be impractical. As reviewed in Annex A of the report, it is difficult to devise a realizations-based capital gains tax system that effectively charges interest to neutralize deferral benefits and thus lock-in effects, while at the same time not imposing excessive if not impossible compliance and administrative hurdles. The information requirements for an interest penalty scheme based on the actual patterns of gains may be seen as unworkable in certain if not most cases. A smoothing approach based on a notional gains pattern avoids these problems, but raises difficulties of its own. And as 'retrospective' taxation may in some cases result in a tax liability when net losses are realized, securing acceptance of the introduction of such a tax could be problematic.

Instead, most countries with realization-based comprehensive capital gains taxation have in place provisions that address concerns over lock-in inefficiencies, by limiting deferral advantages, while at the same time balancing other policy considerations. These include providing exempt or preferential treatment of gains on targeted property types, taxing long-term capital gains at reduced or tapered rates, providing preferential treatment of capital gains generally by applying a reduced statutory tax rate or partial inclusion, and/or providing a personal allowance that partially shelter capital gains.

Lock-in effects may be viewed as particularly problematic in the case of certain property types, with calls for special tax treatment. For instance, many OECD countries exempt gains on a taxpayer's principal residence, typically subject to certain conditions. Rather than exempt such gains, reduced tax rates or effective tax rates may be provided. An example is Sweden, where only two-thirds of an accrued capital gain on personal residences is subject to taxation to avoid potentially harmful lock-in effects in the housing stock, with tax deferral if proceeds are used to by a new home.

Rather than or in addition to targeting capital gains tax relief to specific property types, more broad-based relief may be provided, with or without regard to the holding period. The U.S. and Spain tax long term capital gains at a preferential rate of 15%, applying a one-year threshold. An alternative approach is adopted by Australia, which applies a 50% inclusion rate to gains on assets held for at least one year (full inclusion for assets held less than a year). A relatively low tax rate implies reduced amounts of tax to be deferred, relative to sales price, implying reduced lock-in incentives. Rather than adjust immediately to a reduced effective tax rate once a long-term threshold is met, the U.K. uses a taper relief mechanism which gradually reduces the inclusion rate (*i.e.* increases the fraction of excluded capital gains) the longer a capital gains asset is held.

This permits a gradual adjustment to reduced rates, rather than a discrete or instantaneous change once a long-term holding period threshold is crossed.

A number of countries tax realized capital gains at a relatively low effective tax rate, compared with ordinary income or other capital income (*e.g.* interest), without regard to the holding period, where one way to reduce the effective rate is through partial inclusion in the personal tax base of capital gains and losses. Canada for example taxes only one-half of realized capital gains. Under Italy's new capital gains tax regime, as of 2004, a 40% inclusion rate applies to gains realized on qualified shareholdings, while net capital gains on non-qualified shareholdings and bonds are taxed at a proportional (flat) tax rate of 12.5%.

For countries with a dual income tax system (*e.g.* Finland, Sweden, Norway under its pre-2006 RISK system), where application of a preferential tax rate to capital income is part of the basic approach, an integral mechanism is provided to alleviate lock-in effects. Taxation of capital gains is deferred under these systems until gains are realized, so that deferral benefits are not eliminated. But the relatively low tax rate applied to capital income, including realized taxable gains, implies reduced amounts of tax to be deferred, implying reduced lock-in incentives.

Exempting capital gains or taxing them at a reduced effective rate to address lock-in concerns may introduce tax-planning incentives, may give up significant tax revenues, and create tax distortions in certain cases. One way to partly address these competing considerations is through the provision of a capital gains allowance that eliminates capital gains tax and lock-in effects for investors with net capital gains below the allowance amount. A number of OECD countries, including Germany, Hungary, Ireland, Japan, Korea, Luxembourg, Turkey and the U.K. provide annual allowances that shelter up to a set amount of gains on (non-business) assets. In Canada, a cumulative lifetime capital gains allowance ($500,000 CDN) is provided for gains on qualifying small business shares and qualified farm property.

Certain approaches stand out as innovative in the way that they address lock-in effects, as well as other policy concerns. Under Norway's 'shareholder model', a modified dual income tax system, investors are granted a personal 'tax-sheltered return' allowance for normal (risk-free) returns, allocated between distributed and retained profit. This allowance, which restricts taxation to returns (including gains) above a risk-free return, largely eliminating lock-in effects for assets paying roughly normal returns, while achieving investment neutrality more generally.

In addressing lock-in, it is important to note that many countries have in place 'roll-over' provisions that in certain cases provide for deferral of capital gains tax beyond the year in which a capital gains asset is transferred or disposed of. In general, rollover relief deepens (rather than mitigates) lock-in effects by extending deferral opportunities. However, such relief may reduce certain lock-in incentives and improve efficiency, at least in certain cases.

A further observation is that an assessment of lock-in incentives requires consideration of the tax treatment of capital gains at death and not only the possible application of capital gains taxes but also other taxes that may apply, such as inheritance or estate taxes that tax accumulated but unrealized capital gains at death. As regards capital gains taxes, deemed realization rules may apply, taxing accrued capital gains on property at death (with share basis stepped-up to current market value to avoid double taxation). Alternatively, tax on accumulated gains at death may be deferred (with the

original basis of shares transferred to inheritors), or instead waived (exempt treatment, with share basis for the inheritors set equal to the market value of shares at the time of death). While a comparison of 'all-in' effective tax rates on accrued gains at the time of death would be required for a proper comparison of lock-in incentives across systems, such an analysis is beyond the scope of this report. The study does however review alternative approaches observed in a number of OECD countries.

Contribute to horizontal and vertical equity

Many country responses to the questionnaire pointed to contributions to horizontal and vertical equity as a main factor behind the adoption of capital gains taxation of individuals. Indeed, the main consideration reported by Ireland in introducing its capital gains tax in 1974 was to strengthen tax equity between those earning primarily ordinary (wage) income and those making capital gains. Likewise in the U.K., a major policy objective when its capital gains tax was introduced in 1965 was to improve fairness in the tax system by ensuring that individuals making capital gains paid tax on them.

Australia notes that the exclusion of capital gains from its income tax base prior to 1985 not only violated the principle of horizontal equity. Exclusion also reduced the effective progression of the personal income tax system and conflicted with the principle of vertical equity, as those with capital income usually have a greater ability to pay taxes. Furthermore, tax avoidance opportunities exploited prior to the introduction of its capital gains tax raised vertical equity concerns as it was generally higher income earners who were able to convert or receive income as capital. Similarly for Spain, the current design of the capital gains tax system which respects the classic main principle regarding taxation – increased taxation accompanying increased ability to pay – is seen as providing for more fair tax treatment.

Encourage savings and promote enterprise

The promotion of household savings and enterprise was identified by a number of countries as a central policy consideration guiding the treatment of capital gains. Canada, for example, underscores the importance of tax-deferred savings including tax deferral through realization-based taxation of capital gains as a means to encourage household savings. Spain and other countries taxing long-term capital gains at a preferential rate (or exempting such gains) similarly indicate that preferential treatment of long-term gains is intended to encourage long-term savings. The U.S. explains that taxation of long-term capital gains at a reduced rate is intended in part to encourage patient capital investment, while also help compensating for a lack of inflation indexing.

In the U.K. where an important policy objective is to promote the financing of enterprise through various tax reliefs to individuals on their savings, tax relief in respect of capital gains is seen as supportive of that policy goal. Taper relief in the U.K. is designed to encourage investment in business assets including assets used for a trade, shares in unquoted trading (as defined) companies, and most employee shareholdings in their employer. In Denmark, the ability to convert employment income into tax-preferred capital gains (on shares, subscription rights, or purchase options) through the use of stock option schemes is intended to stimulate 'share culture', boost savings, investment and growth.

Contain taxpayer compliance and tax administration costs

The questionnaire responses revealed that policy makers are sensitive to the high compliance and administrative costs that taxation of capital gains may entail, and have sought to introduce provisions to contain the overall tax compliance and tax administrative burden. High tax compliance and administrative costs were widely cited as a main reason discouraging adoption of a comprehensive *accruals-based* capital gains tax system, relying instead on a realization-based approach.

When introducing its realization-based capital gains tax regime, Australia eased implementation by adopting transitional rules that generally exempt capital gains on assets acquired before the commencement date of the regime. Australia's experience points out that comprehensively taxing capital gains of individuals may operate to reduce taxpayer compliance and tax administration costs. Prior to comprehensively taxing capital gains, considerable costs were incurred by taxpayers and the tax administration in dealing with uncertainty over whether a gain was on revenue account (taxable) or capital account (exempt). Compliance costs were also met as tax planning arrangements needed to have regard to the general anti-avoidance provisions in the income tax law. Comprehensively taxing capital gains is reported to have minimized such costs.

The Netherlands explains that prior to 2001, interest, dividends and rents were part of taxable income, whereas capital gains were not. This led to the use of financial products to convert taxable capital income into non-taxable capital gains. The government responded by introducing its innovative 'box 3' tax system to address tax-avoidance problems *and* avoid complicated legislation required under the pre-reform system to distinguish between various types of return on invested capital system. By countering tax planning opportunities while avoiding the introduction of a realization-based capital gains tax system and potentially complicated transition rules, compliance and tax administration costs have been reduced.

The U.K. recognizes the potential complexities introduced by capital gains taxation, and points out that a capital gains tax is typically an expensive tax to administer. However, unlike the Netherlands, the U.K.'s policy position is to comprehensively tax capital gains, while providing an annual (tax-exempt) allowance, seen as important to minimize compliance and administrative costs of collecting capital gains tax on small occasional capital gains.

Additional Policy Considerations in the Treatment of Capital Gains

Chapter 2 of the publication addresses two further policy considerations that were identified as important by a number of countries participating in the questionnaire exercise, where the analysis of possible capital gains tax effects is relatively complex and may involve economic modelling to guide policy making – possible effects of capital gains taxation on risk-taking by individuals (portfolio allocation between safe and risky assets), and possible effects on the cost of capital and corporate financial policy.

Possible capital gains tax effects on risk-taking

Seminal work analyzing tax distortions to individual portfolio allocation between safe and risky-assets, including that of Domar and Musgrave (1944), Stiglitz (1969), and Atkinson and Stiglitz (1980), finds that capital gains taxation may impact on risk-taking – that is, the fraction or percentage of household portfolios invested in assets with an

uncertain rate of return. While the 'popular' view tends to be that capital gains taxation will negatively impact (discourage) risk-taking, theory suggests that symmetric tax treatment of capital gains and capital losses may *encourage* the amount of risk-taking in the economy, in effect by providing a risk subsidy.

A key element in the analysis of possible tax effects on risk-taking is the characterization of a representative investor's preferences for risk. The standard model assumes that utility (individual welfare) is increasing in wealth, but at a decreasing rate. With declining marginal utility of wealth, individual investors are risk averse, preferring a certain return on a safe asset to an uncertain return on a risky asset even where the expected returns are the same, and willing to pay a premium to avoid risk (or demanding a risk premium to accept it).

An interesting and perhaps counter-intuitive result from the model is that introducing tax on investment income including capital gains may lead to increased risk taking – that is, an increased fraction or percentage of wealth being invested in risky assets. The finding assumes that an investor's wealth elasticity of demand for risk assets is not significantly greater than unity (*i.e.* a 1% increase in wealth does not increase the level demand for risky assets by significantly more than 1%). The finding of increased risk-taking also rests on the assumption that the government is a full partner with investors, sharing equally in capital gains and losses (*i.e.*, symmetric treatment, with losses deductible at the same effective rate applied to tax gains).

Another result predicted by the basic portfolio allocation model elaborated in the report is that risk-taking will unambiguously increase (decrease) if the government adjusts policy to liberalize (restrict) its capital loss allowance rules, while leaving the effective tax rate on capital gains unchanged. A third result is that a symmetric reduction in the effective tax rate applied to capital gains and capital losses (*e.g.* a uniform decrease in the capital gains inclusion rate and capital loss allowance rate) may increase risk-taking in certain cases, but with effects less certain than an asymmetric adjustment to the capital loss allowance rate.

These findings may encourage policy-makers to consider alternative 'ring-fencing' rules on capital loss offsets. Information gathered on capital loss allowance rules in OECD countries reveals that statutory provisions generally do not provide symmetric treatment of capital gains and losses. While countries generally apply the same inclusion rate to realized capital gains and losses, taxable capital gains are normally drawn immediately into the tax net, while ring-fencing restrictions typically apply that restrict (delay, in some taxpayer cases indefinitely) deductions for allowable capital losses in excess of taxable capital gains. Some but not all countries allow excess capital losses to be deducted against interest income, while few allow excess capital losses to be set-off against ordinary (*e.g.* wage) income. Furthermore, while carry-forward (and in some cases carry-back) provisions are offered by a number of countries, generally one or more restrictions apply and without an interest adjustment accompanying loss carry-forward claims.

On the question of capital loss offsets, it is important to recognise that the effective tax rate applied to capital gains/losses depends not only on tax rules on recognition, inclusion, and loss offset, but also on investor behaviour as regards the timing of asset sales and the scope within an investor's portfolio to minimize tax. In particular, while restrictions on loss claims tend to lower the effective tax rate at which capital losses may be deducted, deferral (and possibly rollover) opportunities operate to lower the effective tax rate on taxable capital gains (with the present value of the tax burden on gains falling

as the realization date is deferred). Thus the extent to which the effective tax rate on capital gains exceeds (or possibly in some cases is less than) the effective tax rate applied to capital losses is an empirical issue, and may be expected to vary depending on the specific investor situation.

Evidence is reported in the country responses of patterns of dispositions to take advantage of the flexibility afforded investors under a realizations-based system, and in particular the ability to choose the date of gain/loss recognition by choosing the year of asset disposition. Where capital losses are ring-fenced to be set-off against capital gains, a tax minimizing strategy may be to sell capital gains-producing assets with accumulated gains just sufficient to fully absorb deductions taken on realized capital losses, and repurchase the capital gains-producing asset if desired. A strategy of deferring recognition of taxable capital gains, while selling and possibly repurchasing capital gains assets just sufficient to claim relief for capital losses, tends to lower the effective tax rate on capital gains, while increasing the effective tax rate at which losses are deducted. Thus for certain investors, the effective tax rate at which capital losses can be deducted may not be less than (and may well exceed) the effective tax rate on gains. However, for other investors with less diversified portfolios, limited deferral possibilities, and more generally fewer opportunities to tax plan, restrictions on loss claims may mean that the effective tax rate at which capital losses are deducted is less than the effective tax rate applied to gains. An assessment of this for the economy overall would obviously be complex to sort out, implying a difficult empirical issue.

A further consideration is that the introduction of very liberal capital loss allowance provisions (*i.e.* with few restrictions on taxable income types that can be offset by capital losses) could be expected to invite another form of tax planning both difficult and expensive to administer and contain. Very generous loss offset provisions may encourage investors to characterize certain consumption activities as business activities to obtain tax deductions for consumption expenses, a clearly unintended result where a policy intent behind more liberal treatment of capital losses is to not impede (and possibly encourage) risk-taking in investment (as opposed to consumption) activities. In other words, full loss offset in practice may result in a subsidy for certain consumption items (*e.g.* operation of a hobby farm) which the government may not wish to target through the tax system or otherwise, with such an outcome not picked up in the basic individual portfolio allocation model.

Furthermore, while the results from the basic portfolio model are interesting and noteworthy, they are conditional in certain other respects. Perhaps most importantly, the results ignore possible implications to individual welfare of varying tax revenues under alternative schemes, implicitly assuming that tax revenues are used to finance general public goods. Recent work emphasises that an assessment of capital gains taxation on risk should address the possibility that shifting risk to government (*e.g.* through loss offsets) may not be costless, with loss claims imparting random effects on government revenues, and thus on public spending, borrowing and tax policy.

Another central issue is whether the tax system should encourage risk-taking relative to the no-tax case – not as an objective in itself, but rather to encourage activities that generate positive spill over benefits and are generally higher risk. This raises questions over positive externalities of certain higher-risk activities and how they might be targeted, questions over to whom these externalities might accrue, as well as questions over types and sources of market failure, and whether, if found, should be addressed through the tax

system or through some more targeted device. Exploring these issues is well beyond the scope of the current study.

Finally, one might add that the framework used to derive the above-noted results from the individual portfolio allocation model assumes that risk-taking is a rational exercise involving the weighing of wealth and substitution effects along the lines indicated by the model. In practice, tax considerations may factor into portfolio allocation decisions in other ways. Thus care must be taken in interpreting the implied policy considerations.

The questionnaire asks countries whether possible influences of capital gains taxation on risk-taking are taken into account when setting tax policy, and if so, how such influences are assessed and factored in. It also asks countries to provide details on their 'ring-fencing' provisions governing capital loss claims.

Norway explains that one of the main objectives of the major tax reform in 1992 introducing the RISK system (with single taxation of dividends (full imputation credits) and capital gains (step-up in share basis)) was to introduce neutral taxation of capital income that would not be expected to influence financing and investment decisions, nor impede risk-taking behaviour. As a general rule under this system, capital losses may be set off against capital gains as well as all taxable income from employment, business and capital.

Similarly, in the decision to replace the RISK system with the 'shareholder model' (beginning in 2006), possible impacts on risk-taking were taken into account. Under the 'shareholder model', aimed largely at reducing incentives present under the RISK system to have earned income taxed as capital income, above risk-free returns are taxed at both the corporate and personal level. However, returns below this level are tax free at the personal level (taxed only at the corporate level), combined with carry-forward provisions for any unused 'tax-sheltered returns' (see Sorensen (2003) for a description of the shareholder model). When considering the design of this new system, possible impacts on risk-taking were analyzed. The analysis found that a system which shields from personal income tax the risk-free opportunity return of an investment, combined with carry-forward and full loss-offset provisions for unused 'tax-sheltered returns' might have a positive effect on risk-taking for less diversified investors (*e.g.* entrepreneurs) compared to the situation under the RISK system. However, as the chosen shareholder model deviates somewhat from such a system, there are effects working to both increase and decrease risk-taking. Thus, taxation under the shareholder model was not expected to have any major net effect on risk-taking.

In the U.S., up to $3000 (USD) of excess capital losses (losses which cannot be set-off against capital gains) may be set-off against ordinary income; while there have been several proposals to increase the $3,000 limit, none have been enacted. The effects of capital gains tax rates on incentives for risk-taking are commonly included among the rationales for a preferential tax rate for capital gains. In this context, the argument is that because the deduction of capital losses against other income is capped at $3000 and individual income tax rates are progressive, the tax system would otherwise be biased against risky investments.

It is sometimes argued that investments in new start-up businesses are more risky than investments in larger, established firms. In 1993, this concern in the U.S. led to the enactment of a 50 % exclusion and a maximum tax rate of 14 % for new investments in certain small business stock purchased at original issue and held for at least 5 years. The business must have less than $50 million in assets (including the proceeds of the stock

sale) at the time of issue and meet a number of other requirements. Under current law, this provision which remains in the law provides very little tax benefit compared to other capital gains tax rates.

Ireland reports that in designing its capital gains tax system implemented in 1974-1975, effects on risk-taking factored into the decision to apply a low 26% tax rate to taxable capital gains, considerably lower than the top rates of personal and corporate income tax in effect at that time. In addition, special attention was paid to the tax treatment of losses. In particular, Ireland allows aggregate capital losses (on all chargeable assets) to be set off against aggregate capital gains other than gains on development land. In general there is no categorisation or ring-fencing of capital gains and losses by type.

In Sweden, debate during the 1990's over the general design of tax policy stressed the importance of symmetric treatment of capital gains and losses in order to not curb risk-taking. The approach in the U.K. has been to identify specific 'business assets' (rather than focusing on risky assets, *per se*) and to attempt to encourage investment in these by providing more favourable tax treatment. Targeted assets are those for which underinvestment is likely, due to positive externalities not captured by the investor, or other market failures such as information asymmetries. The U.K. explains that its capital gains tax system allows certain losses on the disposal of shares in qualifying unquoted trading companies to be set off against ordinary income. A capital gains tax exemption is also provided in respect of certain investments in new high-risk shares in small-and medium-sized enterprises. Furthermore, the normal CGT charge is rolled-over (deferred) when certain business assets, including shares in unquoted trading companies, are given away or the proceeds are reinvested in new qualifying assets.

In the case of Australia, one reason behind the decision to preferentially treat capital gains (half inclusion rate) was recognition of the generally riskier nature of capital investment. Similarly, in Canada the tax treatment of capital gains where only one-half of realized capital gains in included in income for tax purposes recognizes that including the full amount may have undesirable results including a reduction in risk-taking. Rollover provisions also apply whereby tax on capital gains on eligible small business investments can be deferred if the proceeds are reinvested in other small business investments. Policy-makers in Spain considered that taxing long-term capital gains at a preferential (proportional) rate, rather than at ordinary (progressive) personal income tax rates, would boost investment in risk-taking activities.

New Zealand reports that, in considering whether or not to tax capital gains, impacts on risk-taking are analyzed within a framework that takes maintaining investment decision neutrality as a policy objective (investment decisions should be based upon market factors alone, not tax considerations). In the context of risk taking, the taxation of capital gains should not, in theory, create a disincentive (or incentive) to invest in risky assets.

With full loss offset, capital gains taxation would result in investors being prepared to increase their investment in risky assets, as the sharing of gains and losses equally allows risks to be spread that would not be spread by normal market forces. However, in practice realization-based taxation of capital gains creates an incentive to defer tax on gains, and immediately realise and claim losses on assets that have fallen in value. This tax-planning incentive creates a risk to the tax base, to which a common policy response observed in practice is to ring-fence capital losses so that they can only be deducted against similar income (taxable capital gains). Fully taxing the profits of risk taking,

while not fully compensating for the losses reduces the expected return and creates a bias away from riskier assets (although to a lesser extent than allowing no deductions for losses at all), implying reduced risk-taking relative to the no-tax case. Give this, having no comprehensive capital gains tax is seen in New Zealand as minimising the influence of tax considerations in risk taking. This is identified as having been considered a significant factor in the overall decision to not tax capital gains.

The decision by the Czech Republic to provide a tax exemption for tax capital gains on securities held for more than 6 months was based on a qualitative assessment that such treatment would encourage long-term investment and discourage short-term speculative transactions. A decision to ring-fence capital losses was taken to avoid excessive risk-taking, while at the same time address tax avoidance possibilities. Denmark, Finland, Germany and the Netherlands indicate that risk-taking considerations traditionally have not been taken into account when deciding capital gains tax policy.

Possible capital gains tax effects on the cost of capital and corporate financial policy

In addition to influencing portfolio choices of households in allocating wealth between safe and risky assets, and choosing a diversified portfolio, different personal tax rates on interest, dividends and capital gains may also impact firm-level decisions. Where the tax rate on capital gains is low relative to that on dividends, for example, corporate distribution policy may be influenced by the tax system, with corporations discouraged from distributing profits in the form of dividends. As noted previously, a 'corporate lock-in' may result from capital gains tax deferral that lowers the effective tax rate on capital gains. Where the statutory capital gains tax rate is low relative to the dividend tax rate, dividend payout may be similarly discouraged. Where share repurchases are limited and profits are retained due to tax considerations, negative implications for the efficient allocation of capital may result.

Depending on the tax treatment of the 'marginal shareholder', capital gains taxation may also influence corporate financial policy by affecting the relative cost of alternative sources of finance (debt, retained earnings and new share issue), and raise policy concerns in certain cases. Relatively high effective tax rates on capital gains and dividends may exacerbate a tax distortion favouring debt finance tied to interest deductibility, and give rise to concern if corporate debt/asset ratios are relatively high, raising the spectre of instability in financial markets.

In addition to distorting choices over alternative marginal sources of funds, shareholder taxation of investment returns may influence corporate decisions over how much investment to undertake, recognising the need for returns on investment to cover financing costs. That is, capital gains tax policy, as with dividend tax policy, may influence the level of investment undertaken and not simply the mix of funds used to finance it, by influencing in some cases the weighted-average cost of funds. A further possibility is that the relative setting of the capital gains tax rate may impact the timing (as opposed to level) of investment.

The report considers basic results of the King-Fullerton methodology often applied by policy analysts to assess possible effects of personal taxation of investment returns on the cost of capital, and discusses implications of various settings of personal tax rates on capital gains, dividends and interest, and corporate income tax rates. By comparing cost of capital expressions under alternative sources of finance, possible effects of shareholder

taxes on financial policy may be revealed. In particular, where shareholder taxes cause the cost of capital to differ across sources of finance, financial policy decisions of firms may be distorted by the tax system towards sources obtained at the lowest cost, with relative costs influenced by taxation. The results allow one to consider relative settings of shareholder tax rates and corporate tax rates that could leave the tax system having a neutral effect on the financial policy of firms (*i.e.* uniform cost of capital across sources of funds, as observed in the no-tax case).

The questionnaire asks countries whether possible impacts of capital gains taxation on the cost of capital and corporate financial policy are taken account of when setting tax policy, and if so, how such influences are factored in. Countries were also invited to discuss possible effects of capital gains taxation on corporate distribution policies.

The U.S. reports as a policy concern that taxing gains on corporate shares, contributing to double taxation of corporate profits, discourages corporate equity financed investment including financing by new share issue. Furthermore, taxing capital gains at lower rates than dividends and the ability to use basis sooner encourages firms to distribute profits to shareholders by repurchasing shares rather than by paying dividends. As an example of how these concerns have carried over to policy making, the U.S. notes that the recent cut in the tax rate on dividends and capital gains was motivated in large part by the distortions caused by the double-tax on corporate profits. The same low tax rate now applies to both dividends and capital gains, which helps to reduce the incentive to distribute earnings by repurchasing shares, rather than by paying dividends, compared to prior law which taxed gains at a lower rate than dividends. It also reduces the tax advantage of debt finance over equity finance.

In 1994, Sweden had positive personal tax rates on interest income and capital gains, but at different levels and a zero tax rate on dividends (implying double taxation of retained but not distributed corporate income). The potential risk of 'corporate lock-out' effects – that is, tax-induced incentives to distribute profits as dividends, implying a large amount of new share issues as a source of finance – were considered then to be of minor importance in relation to efficiency losses accompanying the double taxation of distributed income. The theoretical framework based on the King-Fullerton model used to assess and explain this policy hinged on the assumption that small- and medium-sized corporations were operating under closed-economy conditions implying, among other things, that domestic personal tax rates will affect the corporate cost of capital.

In the middle of the 1990s, the theoretical framework underlying tax policy decisions in Sweden (again based on the King-Fullerton model) incorporated a small open-economy assumption under which even small- and medium-sized firms are influenced by the international required rate of return, implying that domestic personal tax rates do not affect the cost of capital. Instead, different tax rates on different types of savings were thought to only affect households' portfolio composition decisions, and therefore the ownership structure of assets. Based on this understanding, the government reintroduced the rules from the major tax reform of 1990/91, with the introduction in 1995 of a separate and flat tax rate on all capital income (dividends capital gains and interest), which currently remain in effect.

Finland and Norway also report that possible tax distortions to corporate financial policy have been analyzed by policy-makers using King-Fullerton type models. The tax reform process in Finland during the early 1990s – which involved moving to a dual income tax system, cutting corporate and capital income tax rates, and providing imputation relief, aimed at greater tax neutrality in financing decisions – relied on the

King-Fullerton framework to identify pre-reform distortions. Similarly, possible distortions to financial policy were one of the main policy issues in the design of the tax reform in Norway in 1992. This resulted, among other things, in the introduction of a system with no double taxation of either dividends (full imputation) or capital gains (RISK-system). The policy goal of achieving neutrality with regards to corporate financial policy was maintained in the design of the new 'shareholder model' for taxation of shareholder income (capital gains and dividends).

Policy makers in the U.K. anticipate that the effect of capital gains tax on corporate financial policy is likely to be very limited. As a small open economy that provides tax exemptions for dividends and capital gains accruing to pension funds and non-residents, the marginal investor is likely to be tax-exempt (implying that the cost of funds is determined independently of the domestic capital gains tax). Most infra-marginal investment is also tax exempt when taking into account the annual exempt allowance for capital gains tax, the effective zero% tax rate for lower and basic tax rate taxpayers on dividends, and tax exempt ISA savings. Potential non-neutralities in the tax system are analyzed within a framework that measures effective tax rates on different forms of capital income, different asset types, different taxpayer groups, and different corporate forms. The framework is used to evaluate whether non-neutralities will be worsened by proposed policy changes, while recognizing that such effects may have limited application (due to the openness of the capital market and the importance of institutional investors).

Effective tax rates are calculated in Australia to assess tax implications to the (marginal) share investor resulting from different approaches to financing investment via debt, new equity or retained earnings. Possible distortions to corporate financial policy have influenced capital gains tax policy decisions in Australia, including the decision to tax preferentially capital gains on assets owned for at least 12 months. One reason for this preferential treatment is to lower the cost of equity capital and encourage investment.

New Zealand reports that it also uses the King-Fullerton methodology to analyse possible tax distortions to corporate financial policy, with findings taken into account when addressing the pros and cons of alternative tax strategies. New Zealand's assessment is that while capital gains tax would be expected to discourage retained earnings, this effect could counter other tax biases towards equity financing, implying possibly greater neutrality with capital gains taxation. However, it is very difficult to assess the overall net effects of taxation including capital gains taxation on financial policy, as non-uniform corporate and personal tax rates also distort corporate financial policy in multiple and complex ways. Hence, possible impacts of capital gains taxation on the cost of capital are not considered a decisive factor in the government's decision of whether to tax capital gains.

Capital Gains Tax Design Issues

The questionnaire responses identify a number of considerations in the design of capital gains tax rules shaping their application and impact on the economy. The design dimensions include: realization-based versus accrual taxation; applicable tax rates under a separate capital gains tax or personal income tax; treatment (*e.g.* ring-fencing) of losses; rollover provisions; treatment of gains on a taxpayer's principal residence; treatment of the inflation component of capital gains; treatment of gains on domestic assets owned by non-residents; as well as transitional considerations. A number of points raised in the

report under these headings were already raised above with certain additional details sketched out below.

All of the responding countries tax at least certain capital gains of individuals, and in doing so, apply ***taxation on a realization basis*** rather than accrual basis. The exception is New Zealand which applies accrual taxation to expected gains on corporate bonds. The common approach of adopting a realization-based system recognises that accrual taxation poses significant valuation and liquidity difficulties in certain cases.

Countries report that the ***setting of the statutory tax rate on capital gains/losses*** (specifically, the effective statutory rate, taking into account the capital gain/loss inclusion rate) under a country's personal income tax or separate capital gains tax, can have an important bearing on tax planning incentives. A capital gains tax rate set above or below the tax rate on interest and dividends may also distort portfolio choice, as well as corporate financial and distribution policies as noted above, raising efficiency concerns.

As indicated in the preceding summary of central tax considerations shaping the treatment of capital gains, protection of the tax base was identified as a key policy objective by all responding countries, in particular those comprehensively taxing capital gains. While from a pure base protection perspective there may be interest in aligning the statutory tax rate on taxable capital gains with the tax rate on interest, dividends and labour income, certain other considerations weigh in. Concerns over lock-in effects of capital gains tax as well as other considerations have led New Zealand to waive this tax. Other countries have lowered the effective tax rate on capital gains for similar reasons, in some cases for long-term gains or targeted property types. Under a dual income tax, taxation of investment returns including capital gains at a rate below the rate applied to wage income is a fundamental feature of the system.

As considered above in the summary of possible effects of capital gains taxation on risk-taking, ***'ring-fencing' rules restricting capital loss claims*** are in place in most countries to protect the tax base from various forms of tax planning. The report provides a broad overall account of restrictions on capital loss deductions for at least certain asset dispositions, with considerable diversity observed across countries. Australia may be held out as a representative case, where current year capital losses may be offset against current year capital gains, or carried forward indefinitely to offset capital gains in future years, but not offset against other income of the taxpayer. Norway has relatively generous loss offset provisions that as a general rule allow capital losses to be set off against ordinary income, while certain other countries (*e.g.* Canada, the U.K.) provide similar flexibility for capital losses on certain targeted higher-risk investments. The U.S. opts instead for an overall cap on the amount of excess capital losses that can be set off against ordinary income. Sweden reports a gradual relaxing of capital loss offset rules over time, while Denmark reports recently modifying its rules in this area to allow capital losses on unquoted shares to be deducted against all other income.

A number of responding countries flagged as a key design consideration ***'rollover' provisions*** that enable taxpayers to defer payment of capital gains tax that might otherwise be triggered. The principal reasons for taxing capital gains on a realization basis are to avoid valuation and cash-flow problems associated with accrual taxation. Such concerns may continue to apply for certain dispositions where rollover relief is provided. In other cases where they may not, other arguments may be raised for rollover relief (*e.g.* consideration of the appropriate tax unit, competitiveness concerns, and efficiency arguments).

Three types of *same-asset rollovers* applying to individuals are distinguished in the questionnaire responses. A common type involves transfers of assets within a family. Another type, as provided by the Netherlands, defers capital gains tax where business assets are sold to an employee or to a member of the same partnership. A third type involves transfers of assets from a sole trader or partnership business to a company (*e.g.* to a company in which the sole trader owns all the shares, using Australia again as an example).

Three types of *replacement asset rollover* are also reported: asset-for-shares transactions, asset-for-asset transactions, and share-for-share transactions. The first type involves investment of business assets in a corporation in exchange for an equity interest in the corporation, with rollover treatment recognizing the continued ownership of the business and effective non-realisation of gains on the business assets. Another form of replacement asset rollover involves investment of proceeds from the *disposition of business assets in replacement business assets*. The U.K. for example provides rollover relief for gains on disposals of certain assets used in a trade, profession or vocation where the proceeds are reinvested in replacement qualifying business assets. The policy rationale is to avoid depletion of business capital through a tax charge on disposal of the old asset, which could inhibit modernisation and expansion. Finally, a number of countries provide rollover treatment for company reorganisations including mergers and acquisitions involving *share-for-share transactions*. Sweden, for example, like other EU countries, applies rollover rules in the case of share-for-share transactions in compliance with an EEC directive. This treatment recognises the 'paper-for paper' nature of the transaction: that is, the continuity of the underlying investment and absence of true realisation of a capital gain/loss on the occasion of the reconstruction.

The capital gains questionnaire asked countries to report their ***treatment of a taxpayer's personal residence.*** While capital gains realized on homes would be taxed under a comprehensive income basis, a number of countries provide a full exemption, typically with one or more conditions attached. In Australia, where personal residences are generally exempt from capital gains tax, a partial capital gains tax liability arises to the extent a taxpayer uses the home for income-producing purposes. In the Netherlands, a tax exemption is provided for capital gains on one's principal residence, but is lost if the property is used for business purposes. Similarly, capital gains tax would not apply in the case of New Zealand, nor in Germany where the residence is not used for business purposes. Some countries (*e.g.* Czech Republic, Iceland, Norway) have tests requiring that the taxpayer owned and resided in the home for a fixed period of time, or at least resided in the home at the time of disposition (*e.g.* Denmark). Others provide tax deferral relief through rollover treatment (Spain, Sweden, as well as Iceland under certain conditions).

Another design issue flagged was the ***treatment of the inflation component of (nominal) capital gains.*** A benchmark tax system that taxes comprehensive income would only include *real* capital gains in the tax base. While Spain provides inflation relief in respect of immovable property, as does Luxembourg for buildings, most OECD countries do not attempt to adjust nominal capital gains to net out the inflation component. One reason is that inflationary gains are generally not as prevalent as they once were. Another reason is complexity. In Australia, indexation of gains was replaced in 1999 by the half-inclusion system for gains on assets owned for at least a year. The U.K. has similarly abandoned its indexation allowance for personal taxpayers, in favour of taper relief which exempts an increasing proportion of capital gains the longer the asset is held.

One design consideration identified as centrally important by some is the ***treatment of non-residents***, with the approach varying significantly across countries. In Denmark, for example, no tax is imposed on capital gains of non-resident individuals with portfolio or business interests in that country. Capital gains of non-residents on domestic immovable property (land) are taxed by certain countries (*e.g.* Australia, Norway, Spain, and Germany if the real property is held ten years or less), while gains on shares of resident companies may be taxed depending on whether the non-resident owns a substantial interest (*e.g.* Australia in the case of public companies, Germany, Luxembourg, the Netherlands). Certain countries (*e.g.* Sweden) have special deemed realization rules that apply to taxable accrued gains where a resident becomes a non-resident, while others apply tax at the time of realization (*e.g.* Norway, which taxes capital gains realized on shares of a Norwegian company of a non-resident who has been a Norwegian resident at any point during the five years immediately preceding realization).

These design and additional design features are summarized in tables included in the report. It is hoped that this information, along with the review of Member country assessments of policy considerations in the taxation of capital gains of individuals will provide analysts and tax policy-makers with useful insights into this interesting area of taxation.

Introduction

What considerations guide policy-makers when deciding upon the tax treatment of capital gains of individuals? As in other tax policy areas, choices and ultimate decisions over tax treatment typically involve a balancing of often competing interests, such as base protection and tax revenue requirements, and efficiency and equity goals, with tax compliance and administration considerations also weighing in.

This report releases the findings of a project carried out with Delegates of Working Party No. 2 of the OECD Committee on Fiscal Affairs, investigating policy considerations influencing decisions over whether to tax capital gains of individuals, and in instances of taxation, alternative design features. The exercise involved consideration of certain main findings in the public finance literature, including : 'lock-in' effects of capital gains taxation; effects of capital gains taxation on risk-taking; and effects on the cost of capital and corporate financial policy. The report draws on findings of a questionnaire issued to Delegates to gather information on the relevance of these and other policy considerations shaping personal capital gains tax rules in Member countries.

A second objective of the questionnaire was to gather information on basic tax rules in each country governing the treatment of capital gains of individuals. To keep the international comparison manageable, the review concentrated on the 'pure domestic' case (domestic investors earning capital gains on domestic assets). Questionnaire responses were received from 20 OECD member countries: Australia, Canada, Czech Republic, Denmark, Finland, Germany, Iceland, Ireland, Italy, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Portugal, Slovak Republic, Spain, Sweden, the United Kingdom, and the United States. Summary information on the tax treatment of capital gains in these countries and other OECD countries is presented in a set of tables included in this report.

Chapter 1 first reviews policy considerations that were highlighted by countries participating in the questionnaire exercise ('participating countries') as of central or primary importance to decision-making over the treatment of capital gains of individuals: securing tax revenues; efficiency considerations including 'lock-in' effects; horizontal and vertical equity goals; encouraging savings and investment; and limiting tax compliance and administration burdens. Coverage in chapter 1 concentrates for the most part on issues related to 'lock-in' effects, given the attention to this issue in the questionnaire responses and the number of considerations raised, including: possible disincentives to portfolio diversification, and distortions to the allocation of productive capital, as well as other rigidities and associated efficiency losses; the likelihood of lock-in incentives and implications of preferentially taxing long-term gains; and lock-in implications of the treatment of capital gains at death. Considerably diverse country perspectives on lock-in are reviewed along with various approaches taken to reduce to reduce lock-in incentives. Annex A of the study provides a technical analysis of possible lock-in effects of capital gains taxation under a realizations-based approach, various

design features that have been proposed to neutralize lock-in effects, and practical implementation problems associated with these.

Chapter 2 reviews two policy considerations that were identified by a number of participating countries as important, where the investigation of possible capital gains tax effects is relatively complex and where reliance may be made on various analytical frameworks (economic models) to help guide policy thinking. In particular, this part of the study addresses possible influences of capital gains taxation on risk-taking by individuals (portfolio allocation between safe and risky assets), and on the cost of capital of firms and corporate financial policy. The analysis of risk-taking emphasizes potential discouraging effects of restrictive capital loss offset rules, while the analysis of possible effects on the cost of capital and firm financial policy points to the dependence of results on the tax treatment of the 'marginal shareholder'.

Annex C provides a technical analysis of possible capital gains tax effects on risk-taking of households (portfolio allocation between safe and risky assets) based on the works of Domar and Musgrave (1944), Stiglitz (1969) and Atkinson and Stiglitz (1980), while Annex D considers a basic 'King-Fullerton' framework of the type often used by policy analysts to infer capital gains tax, dividend tax, interest tax and corporate income tax effects on the cost of capital and corporate financial policy, based on the work of Auerbach (1979), Fullerton and King (1984), Edwards and Keen (1984), and Sinn (1987, 1991).

The country responses identified numerous issues in the design of capital gains tax rules influencing their application and ultimate impact on tax revenues and the sharing of the tax burden across taxpayer groups, on portfolio diversification and risk-taking in the economy, and on the cost of capital for investment and the financial and distribution policies of firms. Design dimensions addressed in the study include: realization- versus accrual-based taxation; applicable tax rates under personal income tax or a separate capital gains tax; treatment (e.g. ring-fencing) of losses; rollover provisions; treatment of gains on a taxpayer's principal residence; treatment of the inflation component of capital gains; treatment of gains on domestic assets owned by non-residents; and lastly, transitional considerations.

Tables 1.1, 2.1 and 3.2, appearing in chapters 1, 2 and 3 sections B, C and D respectively, compare in summary form various aspects of the tax treatment of capital gains and losses of individuals, as of 1 July 2004. Table 1.1 first reports whether taxable capital gains are taxed under personal income tax, or under a separate capital gains tax, and whether individual or joint taxation applies. Table 1.1 also provides summary information on the tax treatment of gains on portfolio equity shares, portfolio corporate bonds, a taxpayer's principal residence, and business assets not held as part of trading stock. Table 2.1 reviews offset provisions for capital losses on non-business assets, reporting whether such losses may be deducted only against corresponding capital gains, or may be deducted against other gains, and whether excess gains may be set off against other (investment and possibly ordinary) income. Table 2.1 also reports whether carry-forward (and possibly carry-back) rules apply, and whether non-capital losses may be deducted against capital gains. Table 3.2 provides summary information on rollover provisions, distinguishing 'same asset rollovers', and 'replacement asset rollovers', and various categories within each of these broad categories.

Chapter 1.

Central Tax Policy Considerations in the Treatment of Capital Gains

This chapter first reviews policy considerations that were highlighted by countries participating in the questionnaire exercise as of central or primary importance to decision-making over the treatment of capital gains of individuals: securing tax revenues; efficiency considerations including 'lock-in' effects; horizontal and vertical equity goals; encouraging savings and investment; and limiting tax compliance and administration burdens. The chapter concentrates for the most part on issues related to 'lock-in' effects, given the attention to this issue in the questionnaire responses and the number of considerations raised, including: possible disincentives to portfolio diversification, and distortions to the allocation of productive capital, as well as other rigidities and associated efficiency losses; the likelihood of lock-in incentives and implications of preferentially taxing long-term gains; and lock-in implications of the treatment of capital gains at death. Considerably diverse country perspectives on lock-in are reviewed along with various approaches taken to reduce to reduce lock-in incentives.

The capital gains tax questionnaire asked countries to identify the central or primary considerations factoring into the policy decision of whether to tax capital gains of individuals, with a focus on the pure domestic case – that is, capital gains/losses on domestic property, accruing to resident individual taxpayers. This chapter reviews these policy considerations, as identified by the countries that participated in the questionnaire exercise. Select summary information for all OECD countries on the application of capital gains/losses of individuals is presented in Table 1.1.

It is instructive to begin the policy review by reflecting on the response from New Zealand, an OECD country that does not comprehensively tax capital gains (see Box 1), that its starting point when determining how to treat capital gains is to consider the economic concept of comprehensive income. A comprehensive (Haig-Simons) definition of income makes no distinction between income on revenue account (business income) and income on capital account (capital income). Comprehensive income is simply the sum of the change in an individual's net wealth over the period considered, plus the amount spent on consumption. It represents the increase in a taxpayer's ability to pay tax. Under a comprehensive income benchmark, it follows that households would be subject to tax on gains accruing on the disposition of financial and real property, regardless of whether such gains are 'speculative', in the nature of business income, or are passive, in the nature of capital income.

Box 1.1 'Comprehensive' Taxation of Personal Capital Gains

Assessing whether a given tax system can be classified as 'comprehensively' taxing capital gains in practice is a somewhat arbitrary exercise, given that no country strictly adheres to fully comprehensive treatment (taxing on an accrual basis all real gains accruing on the disposition of financial and real property). Indeed, all countries (including all those participating in this study) exempt at least certain capital gains. This report classifies a tax system as comprehensively taxing capital gains of individuals if the relevant tax base (i.e., the personal income tax base, or the tax base of a separate capital gains tax) includes gains/losses on equity shares of public and private companies held by portfolio investors, including gains/losses on shares held for more than one year. Taxation of gains/losses on assets held for less than one year (short-term 'speculative gains') would not itself imply comprehensive taxation, but rather taxation of gains/losses that are in the nature of business (trading) income. Also, taxation of gains/losses of investors with a substantial interest, in a system that otherwise exempts (non-speculative) gains, would not imply comprehensive taxation. This provision would normally serve the more limited function of countering tax-planning incentives of investors with a significant shareholding to lower their tax burden by converting taxable investment returns and/or labour income into tax-free capital gains.

All of the countries that participated in the questionnaire exercise tax at least certain capital gains of individuals. As noted above, where capital gains are not comprehensively taxed, tax code provisions targeting certain gains are typically introduced i) to tax gains that are part of business income, either by taxing short-term speculative gains, that is gains on assets held for a relatively short period (e.g. under one year), or directly targeting gains on 'business assets', and/or ii) to counter tax-planning incentives that would otherwise exist to convert taxable income (e.g. interest, dividend, wage income) into tax-free capital gains.

New Zealand observes that fully taxing income on a comprehensive basis including accrued capital gains would be consistent with goals of economic efficiency and horizontal equity. However, from this starting point, various practical considerations must be taken into account. The weight of these considerations has discouraged New Zealand from implementing comprehensive taxation of capital gains.

Australia also points out in its response that real capital gains should be included in a comprehensive definition of income and taxed accordingly (as such gains represent an increase in purchasing power similar to receipts of wages, salaries, interest and dividends) to address inefficiencies (see section 1.2) and inequities (see section .1.3) accompanying a lack of comprehensive taxation of capital gains. A balancing of these considerations, as well as difficulties in collecting tax on certain targeted gains through selective tax provisions, have led Australia to introduce broad-based taxation of capital gains.

The various policy considerations identified by countries participating in the questionnaire that have chosen to not comprehensively tax capital gains (Czech Republic, Germany, Luxembourg, Mexico, the Netherlands, New Zealand and Portugal), as well as the policy considerations weighed by countries that have chosen to tax capital gains on a comprehensive basis (Australia, Canada, Denmark, Finland, Iceland, Ireland, Italy, Norway, Slovak Republic, Spain, Sweden, the U.K. and the U.S.) are reviewed below.

The questionnaire responses identify five central considerations factoring into policy-makers' decisions of whether or not to comprehensively tax capital gains. The various considerations include: securing tax revenues; efficiency considerations including 'lock-in' effects; horizontal and vertical equity gaols; encouraging savings and investment; and limiting taxpayer compliance and tax administration burdens. These considerations are reviewed below in sections 1.1 through to 1.5.

1.1. Securing tax revenues

In the absence of comprehensive taxation of capital gains imposed under a country's personal income tax or a separate capital gains tax, capital gains of households generally would not be taxed unless gains of a given type are targeted in the tax code, or the tax administration and/or tax courts rule that certain types of gains should be considered as ordinary income and subject to tax. Where capital gains may be realized tax-free, taxpayers can be expected to take one or more steps to 'artificially' convert (*i.e.*, convert for tax purposes only) taxable income into capital gains in order to avoid taxation.[1]

Of the responding countries, those that comprehensively tax capital gains identify protection of the tax base as a key objective of their legislation. Taxing rather than exempting capital gains counters incentives to artificially characterize or convert taxable ordinary income (*i.e.*, wages and salaries) and investment income (*e.g.*, interest, dividends, rents) into tax-exempt capital gains.

Australia notes that prior to the introduction of its capital gains tax legislation, realized gains that were capital in nature generally were not taxed unless caught by a specific provision, while receipts of an income nature were taxed unless specifically exempted. Opportunities for tax planning to convert income receipts or characterize them as capital gains occurred frequently, and the distinction between income and capital for tax purposes was an important policy concern, one addressed with the introduction of a comprehensive capital gains tax in Australia in 1985.

While taxation of long-term as well as short-term (speculative) capital gains counters tax avoidance incentives, it may not eliminate them. In Spain, for example, while short-term capital gains are taxed as ordinary income and subject to progressive tax rates (along with employment income, investment income, business income and imputed income), long-term net capital gains are taxed at a proportional (flat) tax rate of 15%.[2] As a result, tax-sheltering activities are reported by Spain as being observed on a regular basis with the creation of financial instruments designed to transform income taxed at progressive

rates into long-term capital gains. The Spanish government's response to this situation has been to rely on Spanish Tax Administration rulings that attempt to counter tax-planning incentives by clarifying the tax treatment of different financial instruments.

As in many other cases of tax-arbitrage, a driving consideration is a comparison of statutory tax rates. As noted in the review in section 3.2 of factors guiding the choice over the applicable capital gains tax rate(s), Spain is not alone among countries listed as comprehensively taxing capital gains in having to contend with tax-arbitrage opportunities driven by tax rate differentials across different income types and capital gains, with Iceland, Ireland, Norway and Sweden all reporting similar problems.

In addition to protecting the tax base by countering tax avoidance strategies, the introduction of a comprehensive capital gains tax collects tax revenues on *bona fide* capital gains part of a comprehensive measure of income. This policy consideration together with the intention to reduce incentives to convert taxable income into tax-free gains is a major reason cited by the U.K. for taxing capital gains.

In the case of the U.S., capital gains have been considered to be income and thus have been taxed since the beginning of the U.S. individual income tax in 1913. Ireland explains that its capital gains tax was introduced to not only address equity concerns, but to also raise tax revenue, with the absence of capital gains tax seen as a 'lacuna' in the tax system prior to 1974 when only certain capital gains were liable to corporate or personal income tax.

Australia points out that a comprehensive approach may be more successful than relying on selective provisions to draw certain capital gains into the tax net. Australia explains that, prior to the introduction of its capital gains tax regime, numerous provisions were in the law to bring to account as assessable income gains on the disposal of certain assets. However, only certain kinds of capital gains were successfully brought into the income tax base. Of concern were a substantial number of gains on the disposal of business assets that remained untaxed.

New Zealand takes the view that the introduction of a comprehensive capital gains tax would be unlikely to generate significant tax revenues, at least in the New Zealand case. One reason is that a significant amount of capital gains that would be explicitly taxed at the corporate level under a comprehensive regime is currently effectively taxed at the shareholder level when gains realized at the corporate level are distributed in the form of dividends. Under New Zealand's tax system, individual shareholders are provided with imputation credits that provide relief in respect of the amount of corporate tax that has been paid on distributed profits. With capital gains realized at the corporate level generally escaping corporate income tax, distributions of those gains do not carry with them imputation relief (*i.e.* do not contribute to 'franked'(tax-paid) income and therefore do not generate personal tax credits) and are thus taxed at the personal shareholder level. This tends to reduce the amount of additional tax revenue that could be expected from the introduction of a capital gains tax.

Table 1.1
General Tax Treatment of Capital Gains / Losses of Individuals (as of 1 July 2004)

Country	PIT / CGT	Capital gains allowance	Treatment of gains on portfolio equity shares	Treatment of gains on portfolio corporate bonds	Treatment of gains on principal residence	Treatment of gains on business assets (not held as part of trading stock)
Australia	PIT, separate taxation	No	Shares held < 1 year: capital gain included in assessable income. Shares held ≥ 1 year: 'discounted' capital gain (50%) included in assessable income. Taxed @ marginal ordinary PIT rate.	Same treatment as for equity shares.	Exempt (partial capital gains inclusion to extent used for business or rent).	Non-depreciable assets (*e.g.* land) held >1 year: the general 50% discount is available discounted capital gain (50%) included in assessable income. Taxed @ ordinary PIT marginal rate. On top of general 50% discount, four small business concessions are available: total exemption for gains on small business assets held ≥ 15 years if taxpayer is ≥ 55 years old and retiring, or permanently incapacitated; the 50% active asset reduction provides a 50% reduction of a capital gain; retirement exemption ($500,000 lifetime limit) available for gains on small-business assets; small business rollover which provides a deferral of a capital gain if a replacement asset is acquired. Depreciable assets (*e.g.* machinery): full inclusion in ordinary business income. Gain/loss measured with recapture. Taxed @ ordinary PIT marginal rate.
Austria	PIT, separate taxation	No	Shares held < 1 year: included in full in net taxable capital gains. Taxed @ marginal ordinary PIT rate. Shares held ≥ 1 year: exempt. Capital gains on substantial shareholdings (≥ 1% of share capital during preceding 5 yrs) taxable @ one-half average PIT rate on (total) taxable income.	Bonds held < 1 year: included in full in net taxable capital gains. Taxed @ marginal ordinary PIT rate. Bonds held ≥ 1 year: exempt. Exemption for capital gains on bonds (other than convertible bonds & profit-sharing bonds) issued by debtors having either residence, place of management or seat within Austria.	Exempt if principal residence for at least 2 years prior to the sale, or taxpayer himself has erected the building.	Non-depreciable assets (*e.g.* land): inclusion in net capital gains. Taxed @ marginal ordinary PIT rate. Depreciable assets (*e.g.* buildings, machinery): gain/ loss measured excluding recapture included in net capital gains, taxed @ marginal ordinary PIT rate. Recapture component included in ordinary business income, taxed @ marginal ordinary PIT rate. Special treatment (taxation @ one-half average PIT rate) of gains/losses on *i)* a business owned for more than 7 years; *ii)* shares in a resident company held as a business asset by partnership or sole entrepreneur.

Table 1.1
General Tax Treatment of Capital Gains / Losses of Individuals (as of 1 July 2004)

Country	PIT / CGT	Capital gains allowance	Treatment of gains on portfolio equity shares	Treatment of gains on portfolio corporate bonds	Treatment of gains on principal residence	Treatment of gains on business assets (not held as part of trading stock)
Belgium	PIT, joint taxation	No	Speculative shares (purchased with speculative intent): separate taxation @ 33% flat rate. Non-speculative shares exempt. Separate taxation @ 16.5% flat rate on the sale of a substantial participation (> 25% of share capital) in resident corporation to non-resident company. Option to include speculative gain /loss with other (*e.g.* ordinary) income taxable @ marginal PIT rate if yields lower tax liability.	Speculative bonds (purchased with speculative intent): separate taxation @ 33% flat rate. Non-speculative debt: exempt. Option to include speculative gain /loss with other (*e.g.* ordinary) income taxable @ marginal PIT rate if yields lower tax liability.	Exempt. If gains deemed as speculative, separate taxation @ 16.5% flat rate.	Capital gains/losses realized on business assets (immovable/movable) treated as business income, taxed @ marginal PIT rate applicable to ordinary earned income. Exception: capital gains/losses on undeveloped land are not taxable. Capital gain/loss on depreciable assets measured with recapture.
Canada	PIT, separate taxation	Cumulative life-time CG allowance ($500,000 CDN) for gains on *i)* qualified small business shares, or *ii)* qualifying farm property.	Half (50%) inclusion in net taxable capital gains. Taxed @ marginal ordinary PIT rate.	Same treatment as for equity shares.	Exempt. Recognition of no more than 1 principal residence per family at any one time.	Non-depreciable assets (*e.g.* land): Half (50%) inclusion in net taxable capital gains. Taxed @ marginal PIT rate. Depreciable property (*e.g.* building, machinery): Half (50%) inclusion in net taxable capital gains of gain excluding recapture (selling price minus acquisition cost), taxed @ marginal ordinary PIT rate. Full inclusion in business income of recapture of depreciation claimed, (most assets are grouped in classes and recapture occurs only if the balance for the pool becomes negative); taxed @ marginal ordinary PIT rate.

Table 1.1
General Tax Treatment of Capital Gains / Losses of Individuals (as of 1 July 2004)

Country	PIT / CGT	Capital gains allowance	Treatment of gains on portfolio equity shares	Treatment of gains on portfolio corporate bonds	Treatment of gains on principal residence	Treatment of gains on business assets (not held as part of trading stock)
Czech Republic	PIT, separate taxation	No	Shares held < 6 months: included in net taxable capital gains, taxed @ marginal ordinary PIT rate. Shares held ≥ 6 months: exempt (no exemption if shares are included in business property). Gains on sale of interests in limited liability co., partnership, co-operatives taxable if held less than 5 years.	Bonds held < 6 months: included in net taxable capital gains, taxed @ marginal ordinary PIT rate. Bonds held ≥ 6 months: exempt (no exemption if bonds are included in business property).	Exempt if principal residence for at least 2 years prior to the sale. No exemption where residence is included in business property.	Inclusion in net taxable capital gains. Taxed @ marginal ordinary PIT rate. Gain/loss on depreciable business assets measured without recapture of depreciation.
Denmark	PIT, separate taxation	No	Shares (quoted and unquoted): gains are taxed as capital gains on shares (@ 28% if gains ≤ DKK 44300, and 43% for gains > DKK 44,300).	Exemption for 'unrecognized bonds' (face value in kroner, interest rate exceeds rate set by government, not acquired with borrowed funds). Otherwise taxable @ marginal PIT rate on capital income (33.3%-59.7%) (taxed together with personal income).	Exempt if occupied by the owner and total ground areas is less than 1400 m^2. Otherwise taxed as capital income.	Gains from sale of immovable/movable business property are taxable @ marginal PIT rate on personal income (which includes employment income and business income, and pension income).

Table 1.1
General Tax Treatment of Capital Gains / Losses of Individuals (as of 1 July 2004)

Country	PIT / CGT	Capital gains allowance	Treatment of gains on portfolio equity shares	Treatment of gains on portfolio corporate bonds	Treatment of gains on principal residence	Treatment of gains on business assets (not held as part of trading stock)
Finland	PIT, separate taxation	No (tax exemption for capital gains ≤ 5000€ (in one calendar year) on dispositions of household effects.	Inclusion in income from capital, separate taxation @ 29% flat rate of national income tax. Taxpayer may use a maximum presumed acquisition cost of 20% (50% for assets held for 10 years or longer) of the sale price.	Same treatment as for equity shares.	Exempt if owned and permanently occupied by taxpayer for ≥ 2 years prior to sale. Otherwise separate taxation @ 29% flat rate of national income tax.	Inclusion in income from capital, taxable @ flat 29% rate of national income tax. Depreciable assets: inclusion in income from capital of gain/loss including recapture component, taxed @ 29% flat rate. Cf. Capital gains taxed together with part of business income deemed to be capital income, assessed at 18% of net capital used in business at end of previous year. (13.5% for non-quoted limited company). Under the dual income tax system, capital gains from real property and securities used for business purposes are part of business income. If 18% of net capital is an amount lower than the above mentioned capital gains, the capital income part is set equal to the capital gains. (This rule concerns sole proprietors and partnerships. Capital gains of non-quoted limited companies, as independent taxpayers, are taxed at the corporate tax rate of 29%. DIT applies only to profit distribution.)

Table 1.1
General Tax Treatment of Capital Gains / Losses of Individuals (as of 1 July 2004)

Country	PIT / CGT	Capital gains allowance	Treatment of gains on portfolio equity shares	Treatment of gains on portfolio corporate bonds	Treatment of gains on principal residence	Treatment of gains on business assets (not held as part of trading stock)
France	PIT, family taxation	No	Exempt if total annual proceeds from sales of securities (shares & bonds) ≤ €15,000, per household. Otherwise separate taxation @ 26.3% (2004 income) or 27% (2005 income) flat rate (incl. social taxes). Under certain conditions, annual aggregate proceeds may be taken as the average of such proceeds realized over current year and prior 2 years. Special exemption for gains on interest in qualifying 'innovative new company', if equity interest < 25% of issued capital and has been held for ≥ 3 years (for shares issued on/after 1 January 2004).	Exempt if total annual proceeds from sales of securities (shares & bonds) ≤ €15,000, per household. Otherwise separate taxation @ 26.3% (2004 income) or 27% (2005 income) flat rate (including social taxes). Under certain conditions, annual aggregate proceeds may be taken as the average of such proceeds realized over current year and prior 2 years.	Exempt.	Business assets held < 2 years: inclusion in business income, taxed @ progressive PIT rate on total taxable income (option to spread gains over 3 years). Non-depreciable business assets held ≥ 2 years: taxed @ 16% flat rate (26,3% [2004 income] or 27% [2005 income] including social taxes). Depreciable business assets held ≥ 2 years: gain/loss excluding recapture (sales price less acquisition cost) taxed @ 16% flat rate (26% including social taxes). Recaptured depreciation included in business income; taxed @ progressive PIT rate on total taxable income. Exemption for long-term gains (assets held ≥ 2 years) if business activity exercised for 5 years or more, and annual turnover does not exceed a threshold (350k€ [goods] or 126k€ [services]). Partial exemption where threshold (250k€ [goods] or 90k€ [services]) is exceeded but turnover is less than 350k€/126k€ threshold. Exemption from capital gains tax on business assets for small business providers of goods (services) if annual turnover ≤ €250,000 (€90,000).

Table 1.1
General Tax Treatment of Capital Gains / Losses of Individuals (as of 1 July 2004)

Country	PIT / CGT	Capital gains allowance	Treatment of gains on portfolio equity shares	Treatment of gains on portfolio corporate bonds	Treatment of gains on principal residence	Treatment of gains on business assets (not held as part of trading stock)
Germany	PIT, joint or separate taxation	Shares held ≤ 1 year 512€ against private gains. Gains on private transactions are not included in tax base if total net taxable gain does not exceed 512€. Shares held > 1 year and of more than 1 % of the nominal capital within the last five years: granting of an allowance of up to € 9060 (depending on the percentage of the holdings), which tapers off for profit of € 36,100 or more.	Shares held ≤ 1 year: half of the profit is tax-exempt, included in net taxable capital gains, taxed @ progressive (ordinary) PIT rates on taxable income. Shares held > 1 year and of less than 1 % of the nominal capital: exempt. Shares held > 1 year and of more than 1 % of the nominal capital within the last five years: half of the profit is tax-exempt, included in net taxable capital gains, taxed @ progressive (ordinary) PIT rates on taxable income.	Bonds held ≤ 1 year: included in net taxable capital gains, taxed @ progressive (ordinary) PIT rates on total taxable income. Bonds held > 1 year: generally exempt.	Exempt if occupied by owner for a minimum period of time. No exemption where residence is used in a business.	Inclusion in ordinary business income, with recaptured depreciation included in gain/loss. Taxable @ progressive (ordinary) PIT rates on total taxable income. Taxpayers 55 years of age or old, or unable to work, may be granted a once-in-a lifetime exemption for gains (up to a ceiling) on liquidation of business.
Greece	PIT, joint filing with separate taxation.	No	Quoted shares: exempt. Unquoted shares: separate taxation @ 5% flat rate.	Interest derived from bonds that companies issue is taxed 10% (flat rate) exempting interest paid to investors that are permanent residents abroad who are exempt from tax.	Exempt.	Final withholding tax @ 20% on gains on sale of (whole) business. Final withholding tax @ 30% for trade name, trademark or goodwill if sold separately.

Table 1.1
General Tax Treatment of Capital Gains / Losses of Individuals (as of 1 July 2004)

Country	PIT / CGT	Capital gains allowance	Treatment of gains on portfolio equity shares	Treatment of gains on portfolio corporate bonds	Treatment of gains on principal residence	Treatment of gains on business assets (not held as part of trading stock)
Hungary	PIT, separate taxation.	Allowance of HUF 200,000 for net gains on private movable property.	Separate taxation @ 20% flat rate.	Publicly-issued & traded bonds: exempt (treat as interest income). Closely-issued bonds: exempt if interest and gains on bonds *i)* do not exceed 105% of prime rate of National Bank of Hungary and *ii)* do not exceed HUF 10,000. Otherwise separate taxation @ 20% flat rate.	Exempt if reinvested in new residence within 5 years after sale. (If new residence is sold within 5 years, exempt amount becomes taxable). Otherwise separate taxation @ 20% flat rate.	Gains from sale of movable/immovable business property: separate taxation @ 20% flat rate. Recaptured depreciation included in ordinary business income, taxed @ (ordinary) PIT rate.
Iceland	PIT, joint or separate taxation	No	Included in net capital gains, taxed as investment income (with interest and dividends) @ 10% flat rate.	Same treatment as for equity shares.	Residence owned ≥ 2 years: exempt; owned < 2 years: rollover relief if funds reinvested in new residence within 2 years No exemption where residence used for business purposes.	Gains/losses on (immovable/movable) business property treated as ordinary business income, taxed with other (non-investment) income @ marginal (ordinary) PIT rate. No recapture of depreciation. Cf. Basic PIT rate: two-tier structure: 25.75% basic rate, plus additional 5% for aggregate taxable income above a threshold.
Ireland	CGT, joint or separate taxation	Allowance of €1,270 against net capital gains	Included in total net capital gains, taxation @ 20% flat rate.	Included in total net capital gains, taxation @ 20% flat rate.	Exempt with land of up to 1 acre. Cf. If sold with development potential, a proportion of the gain is taxed @ 20% flat rate.	Included in total net capital gains, taxed @ 20% flat rate. Cf Exemption of up to €500,000 where business or shares in family business, sold upon retirement (if aged 55 or over). No limit if sale to child or certain nieces/nephews. Land, plant, machinery in corporate business, but personally owned, exempt if sold to same person acquiring shares in the family company.

Table 1.1
General Tax Treatment of Capital Gains / Losses of Individuals (as of 1 July 2004)

Country	PIT / CGT	Capital gains allowance	Treatment of gains on portfolio equity shares	Treatment of gains on portfolio corporate bonds	Treatment of gains on principal residence	Treatment of gains on business assets (not held as part of trading stock)
Italy	PIT, separate taxation	No	Separate taxation: substitute tax @ 12.5% flat rate. Qualified/substantial shareholding in listed companies (> 2% voting power, or 5% of capital): 40% inclusion in 'other income', taxed @ marginal ordinary PIT rate. Qualified shareholding in unlisted companies (> 20% voting power or 25% of capital): 40% inclusion in 'other income', taxed @ marginal ordinary PIT rate. Cf. 60% participation exemption for substantial interests provides partial integration of corporate & personal taxation of retained profit.	Separate taxation: substitute tax @ 12.5% flat rate.	Exempt.	Capital gains/losses realized on business assets (immovable/movable) are treated as business income, taxed @ marginal ordinary PIT rate. Capital gain/loss on depreciable assets is measured with recapture. Capital gains derived from the disposal of a business are included, in full, in taxable income in the fiscal year in which realized. For capital gains on a disposal of a business owned for at least three years, a taxpayer may, under certain conditions, elect to include such gains – in equal amounts – in the taxable income of the fiscal year in which they are realized and in following years, but not beyond the fourth year. For disposal of a business owned for at least 5 years, taxpayer may elect for taxation @ one-half the average PIT rate on aggregated taxable income (measured with reference to the previous two tax years).

Table 1.1
General Tax Treatment of Capital Gains / Losses of Individuals (as of 1 July 2004)

Country	PIT / CGT	Capital gains allowance	Treatment of gains on portfolio equity shares	Treatment of gains on portfolio corporate bonds	Treatment of gains on principal residence	Treatment of gains on business assets (not held as part of trading stock)
Japan	PIT, separate taxation	Various allowances depending on type of asset.	Unquoted shares: separate taxation @ 20% flat rate. Quoted shares: option between separate taxation @ 20% flat rate (special tax rate of 7%, to 2007); or withholding @ 1.05% flat rate applied to gross proceeds.	Separate taxation @ 20% flat rate.	If held > 10 years, first ¥ 60 mill gain taxed @ 10% flat rate; excess taxed @ 15% flat rate. If held > 5 years (but less than 10), separate taxation @ 20% flat rate on gains ≤ ¥ 40 million, 25% rate for gains in excess of ¥ 40 million.	
Korea	PIT, separate taxation	Basic allowance of 2.5 million won for each category of net capital gains on shares, land and buildings.	Separate taxation @ 20% flat rate. Qualified small business shares: separate taxation @ 10% flat rate. Shares on public stock exchange: exempt – however, if ≥ 3% of share capital, or ≥ 10 billion won of total market value, separate taxation @ 20% flat rate if held ≥ 1 year; separate taxation @ 30% flat rate if held < 1 year.	Exempt.	Exempt if owned by taxpayer ≥ 3 years. If situated in metropolitan area, extra condition of occupation by taxpayer ≥ 2 years.	Only land and buildings: separate taxation @ rates from 9% to 36% if held ≥ 2 years; @ 40% flat rate if held < 2 years and ≥ 1 year; @ 50% flat rate if held < 1 year. Exception - construction business: joint taxation @ rates from 8% to 35%.

Table 1.1
General Tax Treatment of Capital Gains / Losses of Individuals (as of 1 July 2004)

Country	PIT / CGT	Capital gains allowance	Treatment of gains on portfolio equity shares	Treatment of gains on portfolio corporate bonds	Treatment of gains on principal residence	Treatment of gains on business assets (not held as part of trading stock)
Luxembourg	PIT, joint or separate taxation	50,000 € against non-speculative gains (on shares held ≥6months). 100,000€ under joint taxation.	Shares held < 6 months: included in net taxable capital gains, taxed @ marginal ordinary PIT rate. Shares held ≥ 6 months: exempt. Substantial participation (≥ 10% of share capital at any time over preceding 5 years) held 6 months: gain/loss taxable @ one-half the average PIT rate on total income.	Bonds held < 6 months: included in net taxable capital gains, taxed @ marginal ordinary PIT rate. Bonds held ≥ 6 months: exempt.	Exempt.	Gains from the sale immovable/movable business property treated as ordinary business income taxable @ one-half the average PIT rate on total income. No recapture of depreciation.
Mexico	PIT, separate taxation	No	Quoted shares: exemption for gains on sale of shares listed and traded on authorized stock exchange. Unquoted shares and quoted shares not traded in authorized stock exchange: taxable under PIT (current year marginal PIT rate applied to taxable amount tapered by authorized deductions, plus average PIT applied to non-tapered amount).	Taxable @ marginal PIT rate (provisional/creditable withholding tax rate of 0.5%)	Exempt, if occupied by the owner.	Taxed in same manner as capital gains on unquoted shares

Table 1.1
General Tax Treatment of Capital Gains / Losses of Individuals (as of 1 July 2004)

Country	PIT / CGT	Capital gains allowance	Treatment of gains on portfolio equity shares	Treatment of gains on portfolio corporate bonds	Treatment of gains on principal residence	Treatment of gains on business assets (not held as part of trading stock)
Netherlands	PIT, separate taxation	No	Exempt, except separate taxation @ 25% flat rate on substantial shareholding (direct or indirect ownership of 5% or more of the total issued share capital, or 5% or more of capital of a particular class of shares).	No taxation, except for gains on bonds held as part of a substantial shareholding.	Exempt, provided the residence is not used as business asset.	Gains from sale of immovable/ movable business property are taxed as business income @marginal ordinary PIT rate.
New Zealand	PIT, separate taxation	No	No taxation Cf. Taxation of gains if held for the purpose of resale.	Accrual taxation @ marginal ordinary PIT rate. Cf. Expected gains taxed on accrual basis, while unanticipated gains/losses taxed on realization.	No taxation Cf. Taxation of gains if held for the purpose of resale.	No taxation. Cf. Taxation of certain business assets that are held for resale (*e.g.* land, personal property acquired with intention of resale intention). Recapture of depreciation for assets that have been depreciated.
Norway	PIT, joint or separate taxation	No	Variable partial inclusion in taxable income, taxed @ 28% flat rate, under the so-called RISK system. Cf. Variable partial inclusion mechanism steps-up acquisition cost of each share (annually) by pro-rata share of retained (after tax) profits.	Included in taxable income, taxed @ 28% flat rate. cf. For bonds that are debentures, interest component is taxed on a current basis, while capital gain component is taxed on deferred basis.	Exempt, provided seller has owned residence for ≥ 1 year, and has used it as principal residence for at least one of two previous years, and provided the residence is not used as a business asset.	Capital gains/losses realized on business assets (immovable/movable) are included in taxable income, taxed @ 28% flat PIT rate. Recapture of depreciation for assets that have been depreciated on an individual basis.

Table 1.1
General Tax Treatment of Capital Gains / Losses of Individuals (as of 1 July 2004)

Country	PIT / CGT	Capital gains allowance	Treatment of gains on portfolio equity shares	Treatment of gains on portfolio corporate bonds	Treatment of gains on principal residence	Treatment of gains on business assets (not held as part of trading stock)
Poland	PIT, joint or separate taxation	No	Separate taxation @ 19% flat rate	Same treatment as for equity shares.	Exempt if held > 5 years, or if proceeds used within 2 years to acquire another residence. Otherwise net sale proceeds (sale price less costs of sale) taxed @ 10% flat rate.	Capital gains/losses realized on business assets (immovable/movable) are included in ordinary business income, taxed @ marginal ordinary PIT rate. Taxpayer may opt for taxation @ 19% flat rate. There are no recapture rules.
Portugal	PIT, joint taxation	No	Shares held ≥ 1 year: exempt. Shares held < 1 year: separate taxation @ 10% flat rate (option to include in taxable income, taxed @ marginal ordinary PIT rate, if reduces tax payable)	Exempt (however accrued interest is subject to PIT as capital income).	Rollover if proceeds used within 2 years to purchase, refurbish, en-large another permanent residence, or purchase land used to build a permanent residence.	Capital gains/losses realized on business assets (immovable/movable) are included in ordinary business income, taxed @ marginal ordinary PIT rate.
Slovak Republic	PIT, separate taxation	No	Included in net taxable income, taxed @ 19% flat PIT rate.	Same treatment as for equity shares.	Exempt if owned/used as primary residence for ≥ 2 years. Taxable @ 19% flat rate if used for business or was rented out.	Capital gains/losses realized on business assets (immovable/movable) are included in ordinary business income, taxed @ 19% flat PIT rate.
Spain	PIT, joint or separate taxation	No	Shares held < 1 year: included in net taxable capital gains, taxed @ marginal ordinary PIT rate. Shares held ≥ 1 year: separate taxation @ 15% flat rate.	Capital gains realized on portfolio corporate bonds are included in ordinary capital income, taxed @ marginal ordinary PIT rate.	Exempt, if owner is 65 years of age or older. Rollover if proceeds invested in new primary house (partial relief for partial reinvestment).	Same treatment as for equity shares. Recapture of depreciation with reference to either actual depreciation deductions or minimum depreciation allowances.

Table 1.1
General Tax Treatment of Capital Gains / Losses of Individuals (as of 1 July 2004)

Country	PIT / CGT	Capital gains allowance	Treatment of gains on portfolio equity shares	Treatment of gains on portfolio corporate bonds	Treatment of gains on principal residence	Treatment of gains on business assets (not held as part of trading stock)
Sweden	PIT, separate taxation	No	Included in net capital gains, separate taxation @ 30% flat PIT rate on capital income. Capital gains included in full. Capital losses on shares are 70% deductible, except for losses on shares of mutual funds that hold Swedish debt claims only, which are deductible in full. Cf. Where shares of the same type are bought at different prices, the average cost (average purchase price) method may be used. For listed shares (on domestic or foreign stock market exchange), purchase price may be deemed to be 20% of the sales value.	Included in net capital gains, separate taxation @ 30% flat PIT rate on capital income. Capital losses on listed Swedish debt claims (excluding premium bonds) are deductible in full. Cf. Where debt claims of the same type are bought at different prices, the average cost (average purchase price) method may be used.	Partial (2/3) inclusion in net taxable capital gain, taxed @ 30% flat PIT rate on capital income (20% effective rate). Partial (50%) inclusion of capital loss (*i.e.* only 50% deductible). Rollover relief where gains are invested within a year in a residence.	Immovable business property (*e.g.* land, buildings): partial (90%) inclusion in net taxable capital gains, taxed @ 30% flat PIT rate on capital income (national tax). Movable business property (*e.g.* machinery): included as ordinary business income, taxed @ marginal ordinary PIT rate (national + municipal tax). Recapture of past depreciation.
Switzerland	CGT, joint taxation	No	Exempt.	Exempt.	Exempt.	Movable business property (*e.g.* machinery): included as ordinary business income, taxed @ marginal ordinary PIT rate. Immovable business property (*e.g.* land, buildings): taxation by certain cantons as extraordinary business income @ marginal cantonal PIT rates. Recapture of depreciation by cantons following monistic system; no recapture by cantons following dualistic system.

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Country	PIT / CGT	Capital gains allowance	Treatment of gains on portfolio equity shares	Treatment of gains on portfolio corporate bonds	Treatment of gains on principal residence	Treatment of gains on business assets (not held as part of trading stock)
Turkey	PIT, separate taxation	Various allowances depending on the type of asset	Quoted shares held > 3 months, unquoted shares held > 1 year: exempt. Quoted shares held ≤ 3 months, unquoted shares held ≤ 1 year: included in other income, taxed @ marginal ordinary PIT rate. Cf. Shares in investment funds with portfolio invested 25% or more in Turkish shares: exempt.	Included in other income, taxed @ marginal ordinary PIT rate.	Exempt if used by taxpayer as primary residence for ≥ 4 years prior to sale.	Capital gains/losses realized on business assets (immovable/movable) are included in ordinary business income, taxed @ marginal ordinary PIT rate.
United Kingdom	CGT, separate taxation	£ 8,500 (applied against total net taxable capital gains) for 2005-06. Raised annually in line with RPI inflation.	Included in total net taxable capital gains (*i.e.* total chargeable CG less total allowable CL) taxed @ top marginal PIT rate on savings income (10%/20%/40%). Cf. Total chargeable CG for non-business assets =total taxable CG on non-business assets, less taper relief giving maximum exemption (40%) for non-business assets held > 10 years (*e.g.* individual taxed @ 40% rate on savings income has effective capital gains tax rate of 24%)	Same treatment as for equity shares.	Exempt (subject to conditions)	Included in total net taxable capital gains taxed @ top marginal PIT rate on saving income (10%/20%/ 40%) Total chargeable CG for business assets equals total taxable CG on business assets, less taper relief for business assets. Taper relief provides a maximum exemption of 75% for business assets held > 2 years (*e.g.* individual taxed @ 40% PIT rate on savings income has effective capital gains tax rate of 10%)

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General Tax Treatment of Capital Gains / Losses of Individuals (as of 1 July 2004)

Country	PIT / CGT	Capital gains allowance	Treatment of gains on portfolio equity shares	Treatment of gains on portfolio corporate bonds	Treatment of gains on principal residence	Treatment of gains on business assets (not held as part of trading stock)
United States	PIT, joint or separate taxation	Exempt amount USD 250,000 ($500,000 for married persons filing jointly) for gains on residence.	Shares held ≤ 1 year: included in net short-term capital gains, taxed @ marginal ordinary PIT rate. Shares held > 1 year: included in net long-term capital gains, taxed separately @ flat 15% tax rate (reduced to 5% for taxpayers with marginal PIT rate of 10% or 15% for ordinary tax purposes). Cf. Reduced tax rates scheduled to expire 31 December 2008, with the 15% (5%) flat rates replaced by 20% (10%) flat rates. In addition, a reduced rate of 18% (8%) will apply to gains on assets held at least 5 years.	Gain from the sale of market discount bonds purchased at a price below face value is treated as ordinary income to the extent of accrued market discount on the bond (*i.e.* the implicit interest earned while holding the bond). Other gain or loss is treated the same as capital gain or loss for equity shares.	Gain is included in net capital gain and taxed at lower capital gains rate, with an exclusion (exempt amount) of USD 250,000 (USD 500,000 for married persons filing joint return) if owned and occupied by taxpayer as principal residence for ≥ 2 years over prior 5 years. Losses from the sale of principal residences are not deductible.	Depreciable personal property (*e.g.* equipment): part of gain/loss measured excluding recapture (sales price less original cost) is included in net capital gains, taxed @ lower capital gains tax rate. Recapture of past depreciation allowances claimed is included in ordinary business income, taxed @ marginal ordinary PIT rate. Depreciable real property (*e.g.* buildings): part of gain/loss measured excluding recapture (sales price less original cost) is included in net capital gains and taxed @ lower capital gains tax rate if held at least one year. Recapture and other gains: (1) all depreciation is taxed @ ordinary PIT rates if the asset is held < 1 year, and **on non-residential real property depreciated under the Accelerated Cost Recovery system (repealed in 1986).** (2) The excess over straight-line depreciation is recaptured on buildings and improvements **(other than non-residential real ACRS property)** placed in service prior to 1986 or that otherwise use an accelerated method of depreciation. (3) Individuals must pay tax at the lesser of ordinary PIT rate or 25% on all gains attributable to prior straight-line depreciation. If property from a general asset account is sold, the full amount of the proceeds is treated as ordinary income to the extent that the unadjusted depreciable basis of the account exceeds the previously recognized ordinary income from prior dispositions.

Source: 1) Questionnaire responses provided by Member countries; 2) European Taxation Database and European Tax Handbook (2004), International Bureau of Fiscal Documentation.

Notes:

PIT=personal income tax; CGT= capital gains tax (separate from PIT)

Marginal (ordinary) PIT rate = the PIT rate applied to total taxable income (*i.e.* applied to basic or ordinary income including wage income) at the margin (which, under a progressive tax rate structure, depends on the level of total taxable income).

CGT allowance = standard annual exempt amount of net capital gain (not including exempt capital gains).

Numerous tax deferral opportunities would also present themselves, implying less additional revenue collection during the first years following implementation than predicted assuming no behavioural change. Consider first that under a realization-based capital gains tax system, taxpayers are able to control the timing of taxation by controlling the timing of disposition (*i.e.* timing realizations of capital losses so as to offset taxable capital gains, while deferring realization of non-sheltered capital gains). New Zealand notes that deferral opportunities are inevitably created by uncertainty over the application of sometimes arbitrary distinctions between what does and does not constitute a realization event triggering taxation, and uncertainty over what does and does not qualify for rollover relief, under the assumption that rollover provisions would be on order, as they are in most systems taxing capital gains (see section 3.4). On account of these considerations, the revenue gains are seen by New Zealand to be unlikely to be significant enough to outweigh the detrimental effects to the economy of lock-in effects created by capital gains taxation (see section 1.2) which counteract the efficiency gains from taxing all forms of income.

New Zealand therefore follows a targeted approach, with specific provisions in place to tax as personal income certain gains that would otherwise be treated as income on capital account and thus tax-free. Examples include gains from the sale of personal property where the taxpayer is a dealer in such property; gains on the sale of land acquired with the intention of resale; and gains on domestic corporate bonds taxed on an accrual basis.[1]

Similarly for other countries participating in the questionnaire that do not comprehensively tax capital gains, a policy desire to tax gains on financial assets held as business assets (part of business profit), tax 'speculative' gains in the nature of business income, and to address avoidance opportunities, motivates the taxation of certain gains of households. For example, in the Netherlands, which uses its 'box 3' system to tax notional returns on average net capital assets of households (discussed below), tax is separately targeted at capital gains on business assets. In the Czech Republic, gains on sales of interests in limited liability companies, partnership rights in general and limited liability partnerships and membership rights in cooperatives are subject to tax (such gains are exempt after a holding period of 5 years). Taxable gains are either included in aggregate income and taxed at progressive rates, or taxed separately at a flat rate of 15% (with no deduction for expenses).

In Germany, capital gains on securities are regarded as 'speculative profit', in the nature of business (trading) income, and subject to tax where the securities are held for less than one year. In the Czech Republic and Luxembourg, the threshold period is 6 months. As regards real assets held as part of private wealth, the holding period threshold is 2 years in Luxembourg, and 10 years for Germany.[2] In these country examples, capital gains on non-business financial assets held for longer than the threshold period are exempt, unless (in the case of Germany and Luxembourg) they represent a substantial

shareholding, where tax applies to counter tax avoidance strategies aimed at converting taxable income into tax-exempt capital gains. Luxembourg, for example, taxes capital gains on substantial shareholdings (at least 10% participation). In Germany, account is taken of the size of investor participation when joint stock companies are disposed of, and capital gains from dispositions of material interests (participation of more than 1% over the preceding 5 years) are taxed as business income.

Similarly, the Netherlands taxes capital gains on substantial interests (5% participation and above) in equity shares, as well as gains on business assets, and gains on assets which are made available to closely-related entrepreneurs or companies (taxed as business assets). Furthermore, the 'box 3' system in the Netherlands, which taxes a *notional* yield on average net capital assets of households – meant to proxy actual returns in the form of some combination of current period payout plus capital appreciation – directly counters tax planning incentives to artificially convert taxable income into a tax-preferred form.[3]

1.2. Efficiency considerations including 'lock-in' effects

Efficiency considerations were also identified in the questionnaire responses as central to policy decisions over whether to tax, and if so, how to tax capital gains of households. One consideration is that exempting capital gains from taxation while taxing other investment returns may distort portfolio allocation decisions of households in favour of assets generating tax-exempt capital gains, which may give rise to policy concerns – in particular, where capital gains assets (assets generating capital gains/losses) are generally more risky than other assets, implying a tax distortion encouraging risk-taking.[4]

Taxing capital gains at the same effective rate imposed on other investment returns may avoid this type of distortion. However, accrual taxation is difficult on a number of counts. Valuation problems may be met in assessing current market values of capital gains assets held by investors. Taxing accrued but unrealized gains may also introduce liquidity problems for taxpayers with insufficient cash-flow to cover the tax burden. Moreover, providing investors with the cash value of accrued losses in excess of accrued gains required for symmetric treatment of accrued gains/losses may be viewed as problematic.

Given these difficulties, with few exceptions, capital gains of households tend to be taxed on a realization basis, with tax on accrued gains deferred until the year of asset disposition, with deferral operating to lower the effective tax rate on gains. As elaborated below, deferred taxation can create 'lock-in' effects distorting decisions over asset sales – that is, tax-driven incentives to hold onto assets with accumulated unrealised (untaxed) gains to benefit from tax deferral, rather than sell and unlock capital for investments that would be chosen absent tax considerations. Lock-in effects tied to deferred taxation of capital gains may therefore lead to sub-optimally diversified portfolios, and may also misallocate productive capital (implying reduced national income) at least in certain cases.

Thus, exempting capital gains may give rise to tax distortions favouring capital gains assets and thereby encourage risk-taking above levels consistent with tax neutrality. But taxing capital gains under a realization-based system introduces 'lock-in' effects and related inefficiencies. Additionally, lock-in incentives may delay the collection and possible reduce tax revenues as taxpayers defer realizations and potentially avoid tax on

unrealized gains at death, depending on the treatment of gains at death. Various views and perspectives on these considerations were identified in the country responses. For example, concerns over lock-in were identified by New Zealand as a major factor leading to a policy decision to not comprehensively tax capital gains.

Responses received from Australia, Denmark, Norway, Spain, Sweden, the U.K. and the U.S., all countries that comprehensively tax capital gains, indicate as a main objective in taxing capital gains the neutrality goal of avoiding tax-driven incentives to invest in portfolio assets that pay returns in the form of tax-exempt capital gains. However, given the potential for lock-in, different policy approaches are observed in countries taxing capital gains to mitigate lock-in effects. Many tax long-term gains at a preferential rate, tending to reduce lock-in effects on long-term capital gains assets. In Norway, concerns over lock-in helped motivate support for adoption of the 'shareholder model' of taxation. The Netherlands reports that its 'box 3' system, by effectively taxing capital gains on an accrual basis, avoids lock-in effects; moreover, taxation of *notional* returns on average net assets of households, determined regardless of the actual form of return (dividends, capital gains, interest), seeks to avoid tax distortions to asset choice on the basis of the tax treatment of the form of return.

Prior to reporting country positions, possible inefficiencies associated with 'lock-in' are reviewed in section 1.2.a). This is followed by a discussion of lock-in implications of preferentially taxing 'long-term' capital gains (section 1.2.b), and taxing, deferring or exempting from tax capital gains at death (section 1.2.c), with a partial reporting of country approaches including possible taxation of such gains under estate or inheritance tax. Country perspectives on lock-in are then presented (section 1.2.d), followed by a review of approaches, practical and hypothetical, to alleviate lock-in effects (section 1.2.e). Annex A of the study provides a technical analysis of possible lock-in effects of capital gains taxation under a realizations-based approach, various design features that have been proposed to neutralize lock-in effects, and practical implementation problems associated with these.

1.2.a) Possible inefficiencies tied to 'lock-in'

Under a 'pure' income tax based on the Haig-Simons definition of comprehensive income, real net *accrued* capital gains on property, representing an increased 'ability to pay', should be included in the tax net. However, implementing the Haig-Simmons standard poses a number of difficulties. In particular, establishing current market values for certain assets may be very difficult, especially for thinly-traded assets with limited markets, implying significant compliance costs for investors and assessment costs for government, while in additional taxing accrued unrealized capital gains may pose significant cash-flow problems to investors.[5]

Given difficulties posed by accrual taxation, particularly in the case of individual taxpayers, policy-makers are motivated to depart from accrual taxation in favour of the alternative of including capital gains/losses in the tax base (either in full or in part) when the underlying assets are sold or otherwise disposed of and the gains/losses are realized. However this approach of deferring tax on capital gains until realization, while largely avoiding valuation and cash-flow problems, introduces certain other difficulties.[6]

Taxing capital gains/losses on a realization basis encourages the selling of loss-making assets to obtain current tax relief on loss deductions, while also encouraging investors to hold onto assets with accumulated gains in excess of current capital losses to

defer tax liability on them.[7] This mismatch in the timing of the recognition of gains and losses erodes tax revenues and creates pressures for rules to stem the revenue loss, for example through rules governing loss-offsets (discussed in section 1.3). Moreover the 'lock-in' effect to hold onto assets with accumulated capital gains raises efficiency concerns. The main concerns of policy-makers highlighted in the country responses are over sub-optimal portfolio diversification, as well as potential inefficiencies in the allocation of capital across productive assets. Other possible rigidities and inefficiencies are also flagged.

In assessing these, it is important to recognize that lock-in incentives may differ notably across different taxpayers. Lock-in generally would be less likely for investors with well-diversified portfolios able to shelter realized capital gains from tax under flexible capital loss allowance rules, and/or purchase options and other derivatives to hedge against returns on "locked-in" assets (*e.g.* buy assets with returns negatively related to returns on locked-in assets). Also, lock-in would not be expected to apply to domestic tax-exempts or non-resident investors exempt from host and home country tax on domestic-source capital gains. Thus potential inefficiencies in the allocation of productive capital would tend to be less of an issue the more prevalent are domestic tax-exempts and non-resident investors as providers of finance.

i) Inefficient portfolio diversification

Auerbach (1989) emphasizes inefficiencies arising from tax deferral opportunities to postpone payment of tax on assets with accrued capital gains which discourage investors from optimally diversifying their portfolios. With deferred taxation, portfolio investment decisions are distorted in favour of holding onto portfolios with higher risk relative to a given expected return, compared to portfolio compositions that would be observed under an accrual-based system. An investor may choose to not adjust his/her portfolio where the value placed on the reduced level of risk accompanying a more diversified portfolio does not fully compensate for the additional capital gains tax burden triggered by the sale of the capital gains asset.[8]

Consider a simple example of one investor holding appreciated shares in company A, and another investor holding appreciated shares in company B. Ignoring tax on accrued gains at the time of disposition/realization, each investor might prefer to sell part of his/her current shareholding and use the proceeds to acquire a diversified portfolio with shares in each company, a particularly attractive risk position where expected rates of return on the shares are negatively correlated. But tax payments on accrued gains on the shares may discourage this adjustment, an outcome more likely the greater the stock of accrued gains. Thus, the investors may hold an inefficiently specialized portfolio, foregoing private (and social) benefits of portfolio diversification. By discouraging portfolio diversification, lock-in leads to a sub-optimal distribution of assets across investors.

Auerbach (1989) notes that such distortions impose a social cost, as there are net gains to society from optimal portfolio diversification. Unfortunately, empirical evidence is limited on efficiency losses resulting from lock-in incentives that discourage portfolio compositions that would achieve a more desirable degree of diversification. One study, by Haliassos and Lyon (1993), finds that efficiency losses tied to lock-in are outweighed by efficiency gains due to increased risk-taking by risk-averse investors in the special case where a lump-sum tax is replaced with capital gains taxation. However, the results are conditional on restrictive assumptions, including full offset provisions for capital

losses that motivate risk-taking (reviewed in section 2.1). The results also ignore practical considerations for ring-fencing losses (discussed in section 3.3).

ii) Potential inefficiencies in the allocation of productive capital

A second possibility is that 'lock-in' may distort the allocation of capital across productive assets in the economy and constrain the financing of profitable investment, at least in certain cases. For example, an investor may become aware of an investment project that offers a higher expected return (*i.e.* higher pre-corporate tax rate of return) at the same level of risk as a currently held asset with accumulated untaxed capital gains, and yet may choose to not adjust his/her portfolio where the additional capital gains tax realized on the disposition exceeds the present value of additional after-tax returns realized from asset switching.[9] An efficiency loss would result where the alternative investment offering higher pre-tax returns does not receive financing.

An efficiency loss of this type would be less likely if information on investment opportunities is widely available, access to capital markets is open, and potential investors include tax-exempt institutions and other tax-sheltered investors for whom lock-in incentives generally do not arise. But if capital market imperfections or impediments exist that restrict the financing of investments paying pre-tax rates of return in excess of those generated by locked-in assets, economic rents may not be realized in certain cases, implying welfare losses.

In the preceding example, if an investment project paying a higher pre-tax rate of return is financed, but the financing is by non-resident investors, national welfare may be viewed as reduced if it were the case that a domestic investor would have provided finance but for the lock-in effect. This follows where economic profits from the investment accrue abroad, rather than to domestic savers. Normally, inbound investment may be viewed as not compromising national welfare, but this view is normally taken where foreign capital is available when domestic financing is not – or more precisely, where foreign capital is available at a lower financing cost (lower required rate of return to investors/shareholders). If, however, in the absence of the lock-in effect, domestic investors would be willing to finance domestic investment in expectation of rates of return equal to (or less than) that demanded by foreign capital sources, then the outcome of the lock-in inhibiting reliance on domestic funds may be viewed differently.

Finally, it is important to recognize that while lock-in incentives from deferral opportunities may inefficiently allocate productive capital in certain cases, it is not clear that this would always be the case. Many would argue that for at least certain types of investments, for example in R&D, 'patient capital' needs to be encouraged. Lock-in effects created by deferral could be helpful in this regard. As a further measure, the tax system may treat more leniently long-term gains on shares. As reported in section 1.2.b), a number of countries view favourably (and seek to reinforce) lock-in effects, at least in certain cases.

iii) Other possible rigidities and inefficiencies

Another 'lock-in' effect may be created by capital gains tax deferral that lowers the effective shareholder tax rate on capital gains. A low effective capital gains tax rate, compared with the effective tax rate on dividends, may distort corporate distributions policy, and in particular encourage corporations to reinvest profits rather than distribute them to shareholders – a 'corporate lock-in' effect.[10] Corporate lock-in effects may carry

negative efficiency implications where funds are reinvested in assets with inferior risk/return profiles compared with alternative investments.

In principle, corporate managers, acting in the interest of shareholders, would reinvest profits in own-business operations only if expected after-corporate tax returns were higher than those available elsewhere in the market, for a given level of risk. However, managers that may face incentives to retain profits internally (*e.g.* if they own stock options in the firm) may be more inclined to retain rather than distribute funds on account of a low effective capital gains tax rate. Individual shareholders may be more accepting of reinvestment and agree to this use of funds, in recognition of the lower effective tax rate on capital gains, despite uncertain rates of return on investment projects with the firm.[11]

1.2.b) "Lock-in" implications of preferentially taxing long-term capital gains

It is interesting to consider the lock-in implications and objectives of systems that adjust the tax treatment of realized capital gains depending on the holding period. As indicated in Table 1.1, certain OECD countries offer special tax treatment (*e.g.* tax exemption or a reduced tax rate) to gains realized on securities held beyond some threshold holding period. Austria and Portugal, for example, exempt capital gains on portfolio equity shares held for one year or more, while France exempts gains on portfolio equity shares held for at least three years in qualifying 'innovative new companies'.

A number of countries apply reduced tax rates rather than exempt 'long-term' capital gains. The U.S. and Spain tax long term capital gains at a preferential rate of 15%, applying a one-year threshold. An alternative approach is adopted by Australia which applies a 50% inclusion rate to gains on assets held for at least one year (full inclusion for assets held less than a year). Rather than adjust immediately to a reduced effective tax rate once a long-term holding threshold is met, the U.K. uses a taper relief mechanism which gradually reduces the inclusion rate (*i.e.* increases the fraction of exempt capital gains) the longer a capital gains asset is held. This permits a gradual adjustment to reduced rates, rather than a discrete or instantaneous change once a long-term holding period threshold is crossed.

As noted earlier, taxation of capital gains on a deferred (realization) basis lowers the effective tax rate on accrued capital gains below the statutory rate, owing to the time value of money. The longer the holding period, the lower is the effective tax rate.[12] This tax advantage tends to encourage the purchase and holding of capital gains assets (*i.e.* encourages lock-in), with the strength of the lock-in depending on the amount of taxable gain relative to the sales price, and the applicable capital gains tax rate.

Providing preferential treatment for 'long-term' capital gains lowers the effective tax rate (to zero in the case of a tax exemption) on capital gains accruing over the entire holding period, once the threshold holding period is passed. The reduction in the effective tax rate is greater than that under tax deferral alone, provided that the required holding period for an exemption is not very long and the holding period condition is met.[13] Where the required holding period to qualify for preferential (*e.g.* exempt) 'long-term' capital gains is, say 3 years, then investor demand for qualifying capital gains assets may be increased (in the case of shares, the required pre-tax rate of return may be reduced), relative to the straight deferral case. Lock-in incentives would also tend to be stronger than with straight deferral and more pronounced as the holding period approaches the threshold, assuming positive accrued gains, owing to the more negative

tax implications of selling rather than holding onto the asset. In general, the outcome of increased lock-in incentives over the period leading up to the threshold period would be an intended goal of preferential treatment of long-term capital gains. (For loss-making assets, the tax incentive to dispose of the asset generally would be greater, compared to that under a system with no holding period distinction, on account of the more limited or non-recognition of capital losses after the threshold period assuming symmetric treatment of capital losses with capital gains.)[14]

In the case of tax exemption for long-term gains, once the threshold (*e.g.* 3-year) period is reached and accrued and future gains realized from that time forward are exempt, the lock-in incentive would be removed. However, as future returns on an asset passing the threshold would continue to be tax-exempt, a tax-related incentive to hold on the capital gains asset could remain. However, this effect, while also linked to a comparison of effective tax rates, is distinct from lock-in driven by anticipation of reduced taxation on accumulated gains.

If the holding period to trigger a capital gains tax exemption is relatively short, say for example 6 months, then lock-in effects are unlikely to be of relevance or concern for the most part. In such cases, the policy approach may generally be seen as one of taxing speculative gains (in the nature of income), while exempting capital gains more generally – not to encourage lock-in over the short-term, but to avoid lock-in distortions that would present themselves once the short-term mark is passed.

1.2.c) Lock-in implications of the treatment of capital gains at death

An assessment of lock-in incentives under a given tax system requires consideration of the tax treatment of capital gains at death. Moreover, it requires consideration of not only the possible application of capital gains taxes, but also other taxes that may apply, such as inheritance or estate taxes that tax assets assessed at market value reflecting accumulated but unrealized capital gains at death.[15] As regards capital gains taxes, deemed realization rules may apply that tax accrued capital gains on property at death (with asset basis stepped-up to current market value to avoid double taxation). Alternatively, tax on accumulated gains at death may be deferred (with the original basis of a capital gains asset transferred to inheritors), or instead waived (exempt treatment, with asset basis for the inheritors set equal to the market value of shares at the time of death).

Where an individual knows that one is able to escape taxation of accrued gains on assets held at death, the lock-in incentive for that individual would generally be greater, *ceteris paribus*, compared to the situation where such gains are taxed at death. However, this presumes the absence of an inheritance tax or similar charge that would effectively tax accrued gains.[16] In the U.S. example, an estate tax is applied. A review of rules in this area reveals a range of approaches. While a comparison of 'all-in' effective tax rates on accrued gains at the time of death would be required for a proper comparison of lock-in incentives across systems, such an analysis is beyond the scope of this report which provides, in what follows, a brief review of alternative approaches observed in a number of OECD countries.

As noted, some countries have deemed recognition rules as part of their capital gains tax system that tax accrued gains at death. Others defer capital gains taxation, rolling accrued gains over to inheritors to be subject to tax on those gains at the time of eventual asset disposition. To achieve this, the original basis of capital gains asset is assumed by

(carried over to) the inheritors. Others provide an exemption that fully waives capital gains tax on accrued gains at death, instead taxing the value of the asset including underlying gains under an inheritance tax (imposed on the fair market value of bequeathed assets, including a capital gains component). Still others impose inheritance tax, while also drawing accrued gains in the capital gains tax (or income tax) net.

Canada, for example, taxes accrued capital gains on property at death, with asset basis adjusted to avoid double taxation. Similarly, in New Zealand taxable capital gains accrued at the time of death are deemed to have been realised at the time of death and are subject to income tax. Deemed realization rules also apply in Denmark, taxing accrued capital gains at death (taxation of capital gains can be deferred in the case of certain majority shareholdings). Additionally, accrued capital gains are subject to inheritance tax.

In the case of the Netherlands, accrued taxable gains at death on equity shares (5% or more) and business assets at death generally are subject to tax (other assets are not liable to a tax on capital gains upon death). However, upon request, accrued gains and hence the tax liability can be passed on to the inheritors, who must then pay the tax if and when they sell the inherited assets. Inheritance tax also applies. Where accrued gains are not passed onto inheritors, income tax on accrued taxable gains is deductible for the tax base of the inheritance tax. When accrued gains are passed on to the inheritors (and no income tax is paid), a deduction for inheritance tax purposes is allowed for the latent income tax which the inheritors must pay upon realization. Furthermore, rules are in effect which partly provide quittance or extension of payment, when inheritors continue the business of the deceased.

In Australia, accrued capital gains at death generally are not taxable at the time of death, either under capital gains tax provisions or another form of tax. Instead, rollover provisions apply that tax the accrued gain when a beneficiary disposes of the inherited asset (other than by death).[17] An exception to the general rule of extended deferral through rollover can arise where an asset passes to a tax exempt entity, the trustee of a superannuation fund, or in certain cases to a non-resident.

Similar treatment applies in Spain where, since 1992, accrued capital gains are not subject to personal income tax at death. Instead, taxation is deferred until the eventual sale of the asset by those to whom ownership is transferred.

In Sweden, rollover treatment is provided so that only inheritance tax applies to accrued capital gains at death. Under rollover provisions, the successor is treated as having acquired assets at the cost at which they were acquired by the deceased. This treatment avoids valuation problems at the time of death, while at the same time effectively avoiding tax on accrued capital gains.[18]

Accrued capital gains at death are exempt from capital gains tax in the United States, with the basis of assets acquired by heirs stepped-up to their market value at that time of death. One rationale for the decision to provide for a step-up in basis at death is that the unrealized gains are subject to tax under the estate tax at tax rates much higher than historical capital gains rates. To impose the capital gains tax as well was regarded as imposing a double layer of tax. This rationale is recognized in tax regulations on this issue and in the current law provision to require a carryover basis (so that heirs would be subject to tax on any accrued gains) when the estate tax is repealed in 2010.

Like the U.S., Ireland does not impose capital gains tax on unrealized capital gains on assets held at death, with the imposition of tax on the assets of a deceased being regarded

as a politically emotive issue. However, Ireland imposes inheritance tax on the deceased's beneficiaries in respect of their inheritance, subject to certain reliefs and thresholds. It was considered that two taxes at the time of death (*i.e.* capital gains tax and inheritance tax) would be excessive.

Similarly, no liability to capital gains tax arises in the U.K. upon death (gains/losses that accrued up to the date of death are wholly exempt). While a deceased person's total estate, including all capital assets, is potentially liable to inheritance tax, a number of relief measures are provided. Among the most important measures are transfers of property between spouses. These transfers are exempt from inheritance tax, as are transfers of an interest in an unincorporated business, transfers of shares in an unquoted trading company, and transfers of a controlling interest in a trading company.

In Luxembourg, only effectively realised capital gains are taxed, and holding requirements remain valid for the heir. Thus for example if the decedent had acquired securities two months before his death, the heir would have to wait another four months for capital gains on those securities to be tax-exempt.

In Mexico, accrued capital gains at death are fully exempt from capital gains (income) tax and inheritance tax. The Czech Republic also provides a capital gains tax exemption, waiving capital gains tax at the time of death so that neither the executor of the estate nor the beneficiary are subject to capital gains tax on accrued gains. And while inheritance tax is in place, property left to spouses, children, grandchildren, parents and grandparents is exempt.

In Germany, inheritance tax is levied separately on each beneficiary or donee in respect of his/her share in the estate. In the case of Norway, inheritance tax applies as it does in Iceland for each beneficiary, except in the case of spouses and cohabiting persons, which are exempt. Neither Germany nor Norway impose capital gains tax on accrued capital gains at the time of death.

1.2.d) Country perspectives on 'lock-in' effects

The questionnaire asks countries to identify possible lock-in effects from the taxation of capital gains and related policy concerns. Lock-in effects in principle could be distinguished on the basis of asset type (*e.g.* where capital gains tax rules target certain property), holding period (*e.g.* where the effective tax rate applied to realized gains differs between 'short-term' and 'long-term' gains); and investor groups (*i.e.* taxable versus exempt). Another issue is whether lock-in considerations pertain primarily to effects on portfolio diversification, and/or possible concerns over effects on the composition of productive assets in the economy and thus total national income.

i) Lock-in effects regarded as a significant concern in certain countries

New Zealand and the Netherlands regard lock-in effects under standard realization-based approaches to taxing capital gains as posing a significant policy concern, leading them to avoid realization-based taxation of capital gains, except in certain specific cases (*e.g.* certain gains that are deemed business income).

New Zealand, unlike most other OECD countries, waives capital gains tax on holdings of domestic portfolio equity shares. Instead, a distinction is made between income on revenue account, and income on capital account, with gains under the former

drawn into the tax net.[19] A main reason for having avoided comprehensive capital gains taxation is to avoid lock-in effects and a resulting inefficient allocation of resources.

New Zealand explains that, given that one of the benefits of taxing capital gains is a reduction in tax-based distortions to portfolio allocation and thus increased efficiency, distortions resulting from lock-in under a realizations-based approach are of major concern. In the absence of tax considerations, if investors can earn a higher return by investing in an alternative asset of equivalent risk, then they would normally choose to sell the current asset and reinvest in the asset earning the higher return. This would mean an efficient allocation of resources. However a realizations-based capital gains tax provides an incentive to defer realisation of capital gains and thereby discourages optimal portfolio diversification if tax on realisation of the capital gain on the first investment exceeds the increase in return resulting from reallocation.

Taxing capital gains on an accrual basis would not result in lock-in effects. However, due to the difficulty in valuing many assets, this is not possible – at least not without significant inaccuracy and high compliance costs. This means that lock-in effects would be unavoidable under a capital gains tax. And in the case of New Zealand, the lock-in effects are considered significant enough to outweigh the possible efficiency, equity and compliance gains from removing the capital/revenue distinction. Of particular concern to New Zealand are lock-in effects relating to investment in assets with volatile prices, as such assets are likely to have the largest capital gains. The larger the capital gain, the greater the lock-in effect.

Various government reviews of the tax system in New Zealand have considered the introduction of a separate capital gains tax. The possibility of introducing a capital gains tax in New Zealand had its most substantive review in the late 1980's. The distortions and administrative and compliance costs associated with introducing a realisations based capital gains tax led to a decision to not take this step. A 2001 review of New Zealand's tax system upheld this view, with concern over lock-in effects being a major factor in reaching that conclusion.[20]

This has not always been the view, however. In 1989, a government consultative document on the taxation of income from capital proposed bringing income on capital account within the tax base through a separate capital gains tax.[21] This tax was to be applied on a realisation basis, with recognition that the tax would create lock-in effects. However, efficiency gains from removing the capital/revenue distinction were considered to outweigh inefficiencies resulting from lock-in effects. The consultative document also proposed the introduction of indexation in order to avoid the taxation of purely inflationary gains. The then Labour Government was defeated in the 1990 general election and, as a result, these proposals did not proceed.

The Dutch government was also keen to avoid lock-in effects tied to realization-based taxation of capital gains. As previously noted, an innovative approach adopted in the Netherlands taxes, on a modified accrual basis, a notional yield on net capital assets, under the so-called ‘box 3’ method. With tax imposed each year, lock-in incentives under deferral are avoided. At the same time, with tax liability assessed as a percentage of average net capital assets held in the year, tax compliance and tax administration costs are reduced as there is no need to separately account for dividends, capital gains and interest, with this feature also reducing scope for tax arbitrage. Valuation problems are however met in certain cases, as the base depends on the current market as opposed to book value of assets.

For countries choosing to not tax capital gains on shares in order to avoid lock-in effects, provisions are typically in place, as previously noted, to tax speculative gains on shares held for less than given period (*e.g.* one year) in the nature of business income. A number of countries also have in place provisions to counter incentives that can arise to artificially convert dividend income on shares into capital gains to obtain tax relief, for example through share repurchases. Under the assumption that managers of firms would not undertake conversions of this sort in the absence of direction from shareholders, a number of countries that generally exempt capital gains on shares impose capital gains tax where such influence could be exercised.

The example of Germany may be cited where capital gains taxation is limited to short-term speculative gains in the nature of business income (gains on securities held for less than 1 year, and on real property held for less than 10 years), and to gains on dispositions of material interests (participation of more than 1% in the preceding 5 years) to counter tax planning. This arrangement, providing a capital gains exemption for non-speculative passive holdings, avoids lock-in problems while at the same time has been introduced to strengthen equity financing. Lock-in effects are not seen as a problem by policy-makers, due to the exemptions provided for long-term capital gains on portfolio interests.

Similarly, the Czech Republic reports that its exemption for (non-speculative) gains on assets held for more than 6 months is designed to address lock-in incentives, while at the same time help promote the development of the domestic capital market. In Portugal, potential lock-in effects were taken into account in the decision to fully exempt capital gains on shares held for more than a year

Interestingly, Ireland reports that historic "lock in" effects were demonstrated, in retrospect, by a significant increase in tax yield that followed the reduction in 1998 of the capital gains tax rate from 40 to 20%. The rate reduction contributed to an increase in yield from roughly 245 million euros in 1998, to 1,436 million euros in 2003. Ireland explains that the increased realizations (reduced lock-in) were mainly on static asset portfolios – that is, portfolios that likely otherwise would have been held until death to avoid capital gains tax (as noted above, no capital gains tax liability arises in Ireland on asset transfers to heirs). Ireland also reports that the rate reduction took some pressure off the use of other techniques (*e.g.*, various artificial tax mitigation schemes and hiding assets in tax havens) to avoid the previous 40% tax rate.

ii) Lock-in effects not seen as a significant concern in all countries

For many countries responding to the capital gains questionnaire, including Australia, Canada, Denmark, Finland, Italy, Norway, Spain, Sweden, the U.K. and the U.S., lock-in effects from realization-based taxation were identified as being of some concern, but not significant enough to discourage comprehensive taxation of capital gains – albeit typically with targeted or general tax relief. Advantages of taxing capital gains (*e.g.* raising and protecting tax revenue, avoiding distortions that can arise when dividends are taxed but capital gains are not, and contributing to vertical and horizontal equity) generally were judged by these countries as being more important on balance than efficiency losses from lock-in. At the same time, most countries have in place provisions that address concerns over lock-in inefficiencies by limiting deferral advantages.

As noted above, a number of OECD countries provide special tax treatment for 'long-term' capital gains. Preferentially taxing long-term capital gains may deepen lock-in

incentives over the holding period where full tax rates apply, but reduce (eliminate in the case of an exemption for long-term gains) lock-in effects once the threshold period has passed. [22] Others taper the amount of tax relief depending on the length of the holding period, with such relief possibly targeted at gains on certain assets.

In Australia, capital gains on assets owned by individuals for 12 months or more are effectively taxed at half the normal rate (*i.e.* 50% inclusion rate). Under this regime introduced in 1999 to replace indexation and averaging systems, individuals include in taxable income half of realized capital gains (without reduction for inflation) for assets owned for at least 12 months. Capital gains on assets owned for less than 12 months are taxed at normal income tax rates. The policy reason for taxing short-term gains on assets (held for less than a year) at full rates is that such gains are akin to ordinary income. Australia reports that a key reason for deciding to tax gains on assets owned for at least 12 months at a preferential rate was to reduce lock-in effects.

In Spain, potential lock-in effects were viewed as an important restriction until 1996 at which time Spain introduced relief (a reduced rate) for long-term capital gains. In particular, a fixed proportional (flat) tax rate of 15% applies to gains on assets held for more than 1 year. Spain explains that one of the main arguments to reduce from 2002 onwards the holding period from 2 years to 1 year (to qualify for preferential long-term capital gains treatment) was a reduction in lock-in incentives.

The U.S. reports that debates over capital gains taxation in the U.S. typically include a discussion of lock-in effects. A central concern is that lock-in, by discouraging sales of assets, discourages efficiency enhancing shifts in portfolios and real resources. In addition, lock-in effects reduce tax revenues as taxpayers defer realizations to defer paying the tax, and to eventually avoid it on unrealized gains at death. The U.S. Federal income tax substantially reduces lock-in effects by providing a relatively low preferential tax rate (15%) on long-term gains where lock-in effects are likely to be greater.

The U.S holding period to qualify for the preferential long-term rate is one year. Tabulations of transactions reported on tax returns have shown that any lock-in from the holding period requirement only involved the period within one or two months of the dividing line, implying trivial deferral incentives compared to the potential lock-in on long-term gains on assets held several years or longer. The U.S. notes that the strength of a lock-in effect is generally a function of the amount of tax as a percentage of the sales price (and other factors in some cases). Thus it depends on the tax rate and the ratio of the taxable gain to the sales price. The ratio of gain to sales price is generally higher on long-held assets. Thus lowering the tax rate is likely to have a larger effect on sales of long-held assets.

Taxing long-term gains in the U.S. at a preferentially low rate is also intended to help encourage investment (and possibly to help compensate for the lack of indexing for inflation), with some arguing that investment decisions are too short sighted (a negative lock-in effect) and a tax incentive is justified to encourage investors to hold assets for a longer time period. Compensation for inflation and promoting "patient" capital were among the rationales for a provision enacted in 1993 for new investments in certain small business stock and another provision enacted in 1997 that provided lower rates for assets held 5 years or longer starting in 2001. The latter provision is not currently relevant under the law enacted in 2003 (but it will return in 2009 if the 2003 law is not extended).

In 1998, the U.K. introduced taper relief which exempts an increasing proportion of a capital gain the longer a capital gains asset is held, to replace retirement relief and

indexation relief for individuals, reducing taxation of inflationary gains for individuals.[23] Different rates of taper relief apply for 'business' and 'non-business' assets. The exemption for gains on non-business assets rises to a maximum of 40% for assets held for 10 years or more. For business assets, the maximum exemption of 75% is achieved after 2 years. The U.K. explains that the policy objectives of reduced taxation of long-term capital gains through taper relief are to encourage long-term investment in capital assets, particularly economically productive assets; to reward risk-takers and promote enterprise; and to provide a simpler form of relief for inflationary gains.[24]

The taxation of capital gains from shares has recently been modified in Denmark to address concerns over lock-in effects associated with a pre-reform 3-year holding period requirement for preferential (exempt) tax treatment. Pre-reform, gains on shares held less than 3 years were taxed at the same high rates as other capital income (corresponding to marginal tax rates on labour income), while a tax exemption applied to gains of minor shareholders on quoted shares after a 3-year holding period. While lock-in effects from taxation on a realization basis are not removed, they are reduced post-reform, with the application of lower capital gains tax rates. Moreover, pronounced lock-in effects associated with the 3-year holding period requirement are removed with the tax reform.

A number of countries tax realized capital gains at a relatively low effective tax rate, compared with ordinary income or other capital income (*e.g.* interest), without regard to the holding period. A relatively low tax rate implies reduced amounts of tax to be deferred, relative to sales price, implying reduced lock-in incentives.

Canada for example taxes only one-half of realized capital gains. The capital gains inclusion rate was reduced from 75 to 50% in 2000 for both personal and corporate income tax purposes. This tax treatment recognizes that including the full amount of the capital gain may have several undesirable results, including encouraging lock-in.[25]

Under Italy's new capital gains tax regime, as of 2004, a 40% inclusion rate applies to gains realized on qualified shareholdings measured in votes or value,[26] with net taxable gains taxed at basic personal income tax rates. Net capital gains on non-qualified shareholdings and bonds are taxed at a proportional (flat) tax rate of 12.5%.[27] This tax treatment serves to mitigate lock-in effects that would otherwise apply by providing partial integration of corporate and personal taxation of retained profit and reduced taxation of returns on bonds and similar financial instruments. The new tax regime in Italy abandons accrual taxation applied previously to gains by certain taxpayers (in particular, savings managed by banks), due to the complexities and implied costs involved, in favour of realization-based taxation.

For countries with a dual income tax system (*e.g.* Finland, Sweden, Norway under its pre-2006 RISK system), where application of a preferential tax rate to capital income is part of the basic approach, an integral mechanism is provided to alleviate possible lock-in concerns. Taxation of capital gains is deferred under these systems until gains are realized, so that deferral benefits are not eliminated. But the relatively low tax rate applied to capital income, including realized taxable gains, implies reduced amounts of tax to be deferred (compared to the system that taxes gains as ordinary income), implying reduced lock-in incentives.

Certain other approaches stand out as innovative in the way that they address lock-in effects, as well as other policy concerns. Of the country approaches examined in this study, perhaps the most innovative is the approach developed by Norway, under its 'shareholder model', a modified dual income tax system which restricts taxation to

returns (including gains) above a risk-free return, thereby largely eliminating lock-in effects for assets paying roughly normal returns, while achieving investment neutrality more generally.

Under the Norwegian shareholder model, 'normal' returns on equity are exempt from personal tax, subject only to corporate income tax at the same rate as applied at the personal level to interest income. Normal returns are exempt from personal tax by providing a 'tax-sheltered return' on equity shares, equal to acquisition cost times a normal rate of return, which is allocated between distributed and retained profits.[28] The provision of a tax-sheltered return renders tax treatment akin to that under a cash-flow tax – rather than providing an immediate deduction for the acquisition cost, the cost can be carried forward with interest.

As reviewed in Annex A, the shareholder model eliminates lock-in incentives where capital gains assets earn normal rates of return and tax sheltered allowances are claimed in full. Where above-normal returns are realized, a lock-in incentive results with the personal allowance restricted to a normal rate of return. Norwegian authorities point out that the shareholder model is not completely neutral even in the case where assets earn normal rates of return, as the tax sheltered allowance may only be set off against capital gains from the same share. Thus, any excess allowance is lost when the corresponding asset is sold and the sale price is insufficient to absorb the allowance (*i.e.* the treatment of gains and losses is not completely symmetrical).

Similarly, the approach taken by the Netherlands to tax imputed returns on shares (and other assets) on an accrual basis, rather than actual dividends and capital gains on a realization basis, also stands out as an innovative approach to address lock-in concerns, while also addressing other policy objectives.

1.2.e) Various measures to address 'lock-in' incentives

The country reviews show that various approaches may be considered to address 'lock-in' effects, each involving tradeoffs assessed within the particular country-specific situation. One approach is to exempt capital gains from tax, while targeting certain holdings to counter tax-planning (*i.e.*, income conversion) opportunities, and 'speculative' gains realized by individuals in the nature of business income.

A directly opposite policy position is full accrual taxation. Practical difficulties have meant, however, limited interest in this approach. Indeed, many country responses underline the difficulties that would be met with broad-based accrual taxation requiring periodic valuation of assets, posing significant costs for taxpayers and tax authorities, and creating liquidity problems for taxpayers that must borrow funds or sell assets to pay the tax.

The country reviews reveal, however, that not all countries shy away from taxing individuals on capital gains as they accrue. New Zealand, for example, counters the incentive to convert into tax-exempt capital gains interest income on zero-coupon (deep discount) and other portfolio corporate bonds, by taxing expected gains on such bonds on an accrual basis. Another exception is the Netherlands with its 'box 3' taxation of savings, which avoids lock-in and the need for separate accounting of asset returns with recourse to a notional annual accrued yield measure based on average net capital assets of households.

Options to eliminate lock-in by accrual-equivalent taxation, for example by charging interest on deferred capital gains tax, were judged by the U.K and presumably others to be impractical. As reviewed in Annex A, it is difficult to devise a realizations-based capital gains tax system that effectively charges interest to neutralize deferral benefits and thus lock-in effects, while at the same time not imposing excessive if not impossible compliance and administrative hurdles. The information requirements for an interest penalty scheme based on the actual patterns of gains may be seen as unworkable in certain if not most cases. A smoothing approach based on a notional gains pattern avoids these problems, but raises difficulties of its own. And as 'retrospective' taxation may in some cases result in a tax liability when net losses are realized, securing acceptance of the introduction of such a tax could be problematic.

Aside from exempting capital gains, or taxing them on an accrual or accrual-equivalent basis, a number of other approaches are observed that serve to limit lock-in effects. These include providing exempt treatment in respect of gains on targeted property types, exempting 'non-speculative' capital gains, taxing capital gains at reduced rates generally or for specific asset types by applying a reduced statutory tax rate or partial inclusion, taxing long-term capital gains at a reduced or tapered rate, and the provision of personal allowances that partially shelter capital gains.

Lock-in effects may be viewed as particularly problematic in the case of certain property types, calling for special tax treatment. For example, as indicated in Table 1.1, a number of OECD countries exempt gains on a taxpayer's principal residence, typically subject to certain conditions. A variant is reduced taxation in respect of gains on certain property. In Sweden, one area where lock-in effects have been considered to be harmful is the housing market. If the prospect of tax on accrued gains on personal residences leads households to hold on to their residences for a period longer than they would in the absence of this tax consideration (a sub-optimally long period of time), then an inefficient use of the housing stock results. In order to mitigate the potentially harmful lock-in effects, only two-thirds of an accrued capital gain on personal residences is subject to taxation in Sweden, where it is also possible to postpone the tax-payment stemming from the sale of a home if the proceeds are used to by a new home.

Reducing lock-in effects by reducing the effective tax rate on realized gains, either directly or by drawing net capital gains into the tax base at a partial inclusion rate, goes some way towards reducing distortions, inequities and revenue loss associated with full exemption, and may be seen as an attempt to strike a balance between competing concerns. In Canada, half-inclusion is provided for determining taxable capital gains. For countries with a dual income tax system, including Finland, Sweden and Norway, taxation of capital income including capital gains at a reduced rate forms a basic element of the tax system, which may serve a number of objectives including addressing lock-in concerns. Australia, Spain and the U.S. all tax 'long-term' capital gains at reduced rates once a holding threshold is crossed, while in the U.K. tapering provisions smooth the transition to reduced rates of taxation.

Exempting capital gains, or taxing them at a reduced rate may introduce tax-planning incentives, may give up significant tax revenues, and create tax distortions in certain cases. One way to partly address these competing considerations, pointed out by the U.K., is through the provision of a capital gains allowance that eliminates capital gains tax and lock-in effects for investors with net capital gains below the allowance amount. Such investors would not face the same lock-in incentives as others when considering

how to diversify their portfolio. Investors above the allowance would face lock-in incentives, but only to the extent that realized net gains exceed the threshold level.

As indicated in Table 1.1, a number of countries, including Germany, Hungary, Ireland, Japan, Korea, Luxembourg, Turkey and the U.K. provide annual allowances that shelter up to a set amount of gains on (non-business) assets. In Canada, a cumulative lifetime capital gains allowance ($500,000 CDN) is provided for gains on qualifying small business shares and qualified farm property.

Under Norway's 'shareholder model', investors are granted a personal 'tax-sheltered return' allowance for normal (risk-free) returns, allocated between distributed and retained profit. As reviewed in Annex A, this allowance operates to reduce lock-in incentives, and may largely eliminate them for assets paying normal rates of return.

Lastly, it should be noted that many countries have in place 'roll-over' provisions (considered in section 3.4 and summary Table 3.1) that in certain cases provide for deferral of capital gains tax beyond the year in which a capital gains asset is transferred or disposed of. In general, rollover relief deepens (rather than mitigates) lock-in effects by extending deferral opportunities. However, such relief may reduce certain lock-in incentives and improve efficiency, at least in certain cases, as pointed out by the U.K. Where, for example, the provision of asset-for-asset rollover relief requires that capital released by a disposition be invested in another asset within the same asset category, lock-in effects discouraging diversification within the same asset category may be weakened (while lock-in effects tied to deferral discouraging diversification across different asset categories may be deepened).

1.3. Contribute to horizontal and vertical equity

Many country responses to the questionnaire pointed to contributions to horizontal and vertical equity as a main factor behind the adoption of capital gains taxation of individuals. Indeed, the main consideration reported by Ireland in introducing its capital gains tax in 1974 was to strengthen tax equity between those earning primarily ordinary (wage) income and those making capital gains, with central design features including a low rate applied to a wide base with certain exemptions and reliefs including an annual personal threshold. Likewise in the U.K., a major policy objective when its capital gains tax was introduced in 1965 was to improve fairness in the tax system by ensuring that individuals making capital gains paid tax on them.

Australia notes that the exclusion of capital gains from its income tax base prior to 1985 violated the principle of horizontal equity, since it discriminated in favour of people who obtained their income in the form of capital gains. Exclusion also reduced the effective progression of the personal income tax system and conflicted with the principle of vertical equity, as those with capital income usually have a greater ability to pay taxes. Furthermore, tax avoidance opportunities exploited prior to the introduction of its capital gains tax raised vertical equity concerns as it was generally higher income earners who were able to convert or receive income as capital. Similarly for Spain, the current design of the capital gains tax system which respects the classic main principle regarding taxation – increased taxation accompanying increased ability to pay – is seen as providing for more fair tax treatment.

1.4. Encourage savings and promote enterprise

The promotion of household savings was identified by a number of countries as a central policy consideration guiding the treatment of capital gains. Canada, for example, underscores the importance of tax-deferred savings, including tax deferral through realization-based taxation of capital gains as a means to encourage household savings. Spain and other countries taxing long-term capital gains at a preferential rate (or exempting such gains) similarly indicate that preferential treatment of long-term gains is intended to encourage long-term savings. The U.S. explains that taxation of long-term capital gains at a reduced rate is intended in part to encourage patient capital investment, while also help compensating for a lack of inflation indexing.

The U.K. reports that central policy objectives motivating the introduction of its capital gains tax in 1965 were: raising revenue and protecting the tax base; improving fairness; and improving economic efficiency. Since then, two additional policy objectives have become important in the U.K. One is to encourage savings by individuals through tax-free savings vehicles, such as the Individual Savings Account (ISA), while the second is to promote the financing of enterprise through various tax reliefs to individuals on their savings, including tax relief (*e.g.* taper relief) in respect of capital gains. Taper relief in the U.K. is designed to encourage investment in business assets including assets used for a trade, shares in unquoted trading (as defined) companies, and most employee shareholdings in their employer. In Denmark, the ability to convert employment income into tax-preferred capital gains (on shares, subscription rights, or purchase options) through the use of stock option schemes is intended to stimulate 'share culture', boost savings, investment and growth.[29] Participation in the schemes is limited.[30]

Lastly, the Czech Republic reports that the exemption provided for capital gains on securities held for longer than 6 months is intended to promote household savings in securities.[31]

1.5. Contain taxpayer compliance and tax administration costs

The questionnaire responses revealed that policy makers are sensitive to the high compliance and administrative costs that taxation of capital gains may entail, and have sought to introduce provisions to contain the overall tax compliance and tax administrative burden. Very high tax compliance and administrative costs were widely cited in the questionnaire responses as one of the main reasons discouraging the adoption of a comprehensive *accruals-based* capital gains tax system. As noted above, among the reasons that Italy moved to a realization-based capital gains tax system were the significant tax compliance and tax administration costs associated with its trial of an accrual-based system.

At the same time, not taxing capital gains may result in significant compliance and administrative costs as both taxpayers and government seek to distinguish types of gains to be drawn in or left outside the tax net. Australia, for example, points out that comprehensively taxing capital gains of individuals can operate to reduce taxpayer compliance and tax administration costs. Prior to comprehensively taxing capital gains, considerable costs were incurred by taxpayers and the tax administration in dealing with uncertainty over the capital and revenue account distinction. Compliance costs were also met as tax planning arrangements needed to have regard to the general anti-avoidance

provisions in the income tax law. Comprehensively taxing capital gains is reported to have minimized such costs.

While implementation of a realizations-based system is generally more attractive than an accruals-based approach, reported country positions reveal that policy makers are sensitive to the high compliance and administrative costs that taxation of capital gains may entail, and have sought to introduce provisions to contain the overall tax compliance and tax administrative burden.

When introducing its capital gains tax regime, Australia eased implementation by adopting transitional rules that generally exempt capital gains on assets acquired before the commencement date of the regime. It was recognised that this treatment would create some lock-in effect (generally viewed by Australia as posing limited concerns). The policy reason for this exemption was to allow the taxpayer community a lengthy period in which to adjust to the new tax's application and to avoid the need for valuations of assets already owned. It also increased public acceptance of the new tax.

A main consideration in the Netherlands behind the decision to not comprehensively tax capital gains of individuals was that such a system would require complicated implementation and transition rules and would lead to significant compliance costs. Moreover, the revenue proceeds from the tax would be unstable. Under the Dutch approach, there are only three exceptions to the rule to not tax capital gains of individuals: tax is imposed on gains on business assets, gains on assets made available to closely-related entrepreneurs or companies (such gains are taxed in the same manner as gains on business assets), and gains on a substantial interest in equity shares (5% or more participation).

The Netherlands explains that prior to 2001, capital income including interest, dividends and rents was part of taxable income, whereas capital gains were not. This led to the use of financial products aiming to convert taxable capital income into non-taxable capital gains.[32] Rather than introducing a tax on realized capital gains to counter such abuse, the government introduced its innovative 'box 3' tax law in 2001, to address tax-avoidance problems *and* avoid the introduction of complicated tax legislation, amongst other policy objectives. As noted previously, under the 'box 3' approach, income from savings and investment is taxed on the basis of an assumed (notional) yield of 4% of the average value of net assets in the year, irrespective of the actual yield. With the introduction of this neutral approach that does not distinguish between various types of return on invested capital system, financial products previously used to avoid income tax have lost their comparative advantage. By countering tax incentive opportunities, associated tax-planning, compliance and tax administration costs are reduced.

The U.K. recognizes the potential complexities introduced by capital gains taxation, and points out that a capital gains tax is typically an expensive tax to administer. However, unlike the Netherlands, the U.K.'s policy position is to comprehensively tax capital gains, while providing an annual (tax-exempt) allowance, seen as important to minimize compliance and administrative costs of collecting capital gains tax on small occasional capital gains.

Notes

[1] Indeed, even in countries that comprehensively tax capital gains, investors may attempt to tax plan, push definitional boundaries and exploit 'grey' areas and take advantage of provisions give preferential treatment to certain capital gains.

[2] Long-term capital gains are taxed together with pre-emptive rights to a share subscription owned for more than 1 year, at 15 per cent. From 2002 onwards, the holding period used to distinguish short-term and long-term gains is 1 year (previously 2 years).

[1] Expected gains on domestic corporate bonds are taxed on an accrual basis, while unanticipated gains or losses are taxed (or deductible) on realisation. For example, any premium or discount on a debt instrument is spread on a yield-to-maturity basis over the term of the instrument, while any gain or loss resulting from a change in market interest rates is recognized when and if that gain or loss is realised.

[2] In Luxembourg, capital gains on real assets held less than 2 years are taxed at standard rates of personal tax as speculative profit. Where the holding period exceeds 2 years, the gains are taxed at reduced rates on disposal, with the exception of gains on a principal residence, which are exempt.

[3] The 'box 3' item of personal tax in the Netherlands, introduced in 2001, which taxes capital by assuming a notional yield of 4 per cent on average net capital assets held in a calendar year (as a proxy for actual yields, consisting of dividends, capital gains/losses, interest) shares some features with a capital gains tax. In particular, asset appreciation (depreciation) increases (decreases) tax accruing under box 3. And losses accruing on one asset are in effect set off against gains accruing on another in the same year. However, the box 3 amount cannot be negative, and a capital loss in one year cannot be used to reduce box 3 tax in another (*e.g.* subsequent) year. Note further that the effective inclusion rate is relatively low. If we let V_0 denote the value of total net capital assets held at the beginning of the year, and V_1 denote the value of total net capital assets held at the end of the year, then the 'box 3' tax calculation may be expressed as follows: $t_p[r \times (V_0+V_1)/2] = t_p[r \times (V_0+V_0+\Delta V)/2] = t_p[r \times (V_0+\Delta V/2)]$ where t_p is the marginal personal tax rate, r is the notional yield of 4 per cent, and ΔV is the overall gain/loss accruing on net capital assets. This formulation shows an effective inclusion rate of gains/losses of 2 per cent. By taxing notional rather than actual yields, tax planning incentives to re-characterize income are curtailed directly.

[4] The term 'capital gains asset' is used in this report to refer to an asset that generates capital gains/losses.

[5] A further valuation problem is measuring *real* net capital gains, adjusted for inflation (addressed briefly in section 3.6).

[6] One outcome of allowing investors to defer tax on capital gains until realization (without an interest charge) is that the effective tax rate on capital gains depends on the holding period of the property, with the timing of dispositions normally under the

control of investors. Thus policy-makers have only partial control (through statutory provisions) over the effective tax rate on capital gains. This stands in contrast to the taxation of distributed profit which in most systems is taxed at the time of distribution, and to interest income which is taxed as it is earned.

7 The incentive to sell a loss-making asset to obtain current period tax relief depends on the taxpayer's ability to realize tax savings from a current loss offset, which depends on i) the tax rules governing the types of gains/income that the capital loss can be deducted against (see section 3.3 and Table 2.1 for a summary of capital loss offset provisions in OECD countries); and ii) the taxable amounts of such gains/income in that year. Where capital losses must be set off against capital gains (total capital gains or capital gains of the same type (*i.e.* realized on the same asset type)), an incentive is created to realize capital gains sufficient to absorb the capital loss (with the gains-producing asset then repurchased, if desired). The incentive to not defer the sale of an asset with accumulated losses reflects the time value of money (the present value of a current loss claim is worth more than a future claim of the same loss amount). Under systems that exempt long-term capital gains and symmetrically do not provide a deduction for losses realized on assets held beyond the long-term holding threshold, the incentive to sell (hold onto) a loss-making (gains-making) asset would be expected to increase leading up to the point where the holding threshold is met.

8 The value of reduced risk depends on the investor's risk preferences. For a review of the influence of investor risk preferences on the valuation of risk, see Annex B.

9 The prospective returns on the alternative asset may consist of interest, dividends and/or capital gains. The prospective returns on the locked-in asset may consist of not only capital gains but also dividends or interest. The distinguishing feature of the locked-in asset is a stock of accumulated unrealized/untaxed capital gains.

10 Other tax provisions (*e.g.* the provision of imputation credits to tax-exempt investors) may work in the opposite direction, creating a 'corporate lock-out' effect, with distributions tax-favoured over retentions.

11 In contrast to the 'corporate lock-in' effect, the 'shareholder lock-in' effect addressed in the previous sub-section involves the holding of shares and other capital gains assets by individual shareholders for tax deferral reasons. The 'corporate lock-in' concerns corporate incentives to invest funds in own-business operations or in other (portfolio) assets, rather than distribute earnings.

12 The effective tax rate on accumulated gains is the lowest for gains earned in the first year (or more generally, for gains earned early on over the holding period) for which the tax deferral period is the longest. The effective tax rate on gains accruing in the final year of a given holding period is the same as that under an accrual system, ignoring loss offset opportunities.

13 Where the required holding period is, say, 30 years, then tax relief from tax exemption at the 30-year mark may be seen to be not significantly greater than that under deferral alone, as the present value of the tax burden incurred in 30 years time under deferral may be viewed as negligible. In this case, lock-in incentives in effect with a 'long-term' capital gains tax exemption may not be different from those under deferral alone.

14 Consider a tax exemption for long-term capital gains matched by no deduction for long-term capital losses. If future capital gains are not anticipated on an asset with

accumulated losses, tax considerations would normally reinforce an incentive to immediately sell the asset to realize immediate tax relief in respect of those losses.

15 The tax treatment of gifts is also relevant, but is not addressed in this report.

16 Inheritance tax, where imposed, is normally calculated as a percentage of the fair market value of inherited assets (not just the part of the market value that corresponds to an accrued capital gain).

17 This rule does not apply to a personal residence – the inherited value of a taxpayer's personal residence is the market value of that residence on the day the taxpayer died (*i.e.* gains on an inherited principle residence are exempt from capital gains tax).

18 The Swedish Government has decided to abolish the inheritance tax, as from the 1 of January 2005.

19 As noted in section 1.1, New Zealand taxes gains from the sale of personal property where the taxpayer is a dealer in such property; gains on the sale of land acquired with the intention of resale; and gains (taxed on an accrual basis) on domestic corporate bonds. Additionally, gains under many offshore tax regimes are classified as ordinary income and subjected to marginal income tax rates. This practice generally serves as a backstop to the taxation of income, with a focus on areas where capital gains are particularly substitutable for revenue or labour income.

20 New Zealand Government "Tax Review 2001: Final Report" Wellington, New Zealand, October 2001

21 See: New Zealand Government, "Consultative Document on the taxation of income from capital," Wellington, New Zealand, December 1989.

22 Preferentially taxing capital gains on assets passing a long-term holding threshold may alleviate lock-in incentives that could otherwise apply on assets held long-term, while at the same time encouraging lock-in or 'patient capital' over the period leading up to that threshold.

23 Indexation relief remained for corporate taxpayers.

24 The taper relief approach recognises that indexation relief operates on acquisition cost and hence offers limited relief for gains on assets with low base cost, such as the goodwill developed in a new business.

25 Canada reports that taxation of capital gains was reduced not only by lowering the inclusion rate, but also by reductions in statutory personal tax rates, including elimination of a deficit-reduction surtax, effective 1 January 2001. Additionally, full indexation was restored to the personal income tax system as of 1 January 2000. Also, the effective tax rate on capital gains has decreased as a result of recent reductions in corporate tax rates.

26 A qualified shareholding is defined in terms of voting rights (more than 2 or 20 per cent of total voting rights, depending on whether the shares are listed on a listed stock exchange or not) or value (more than 5 or 25 per cent of the total issued capital, depending on whether the shares are listed or not).

27 In the case of shares and similar financial instruments held in the course of a business activity, a 40 per cent (100 per cent) inclusion rate for gains/losses applies where the instrument qualifies (do not qualify) for participation exemption treatment, with net

taxable gains subject to basic personal income tax rates. Net capital gains realized in the course of a business activity also enter the IRAP tax base.

[28] In calculating taxable capital gains, the taxable gain is derived as the selling price, minus the acquisition cost, minus any residual 'tax sheltered returns' not assigned to distributed profit. As noted in the main text, the tax-sheltered return gives tax treatment similar to that of a cash-flow tax, but less than equivalent relief as any tax sheltered return that is not used when the corresponding share is sold cannot be carried forward (*i.e.* is lost)].

[29] Employment income in Denmark is subject to national and local income tax at progressive rates, while capital gains are subject to national income tax alone. The tax rate on 'income from shares' is tiered. Income from shares not exceeding DKK 44,300 (2006) is taxed at 28 per cent (43 per cent for amounts exceeding the threshold), well below the top marginal tax rate on employment income

[30] First, an employee may be granted shares, purchase options and subscription rights up to a maximum value of 10 per cent of his/her annual salary. Second, an employee may be granted purchase options and subscription rights on shares without restriction if the exercise price is not more than 15 per cent lower than the market price of the shares to which the option/right relates. (As an example, the maximum limit is met where the employee is entitled to purchase shares at a price of 170, and the market price at the time is 200.)

[31] Luxembourg and Germany, countries that also do not tax capital gains on securities privately-held for more than 6 months and one year, respectively (except, in the case of Germany, for gains on material interests) did not indicate in their responses that this exempt treatment was to promote domestic savings. Instead, the rationale behind the taxation of gains on securities held for less than 6 months/one year is to tax speculative gains in the nature of ordinary (trading) income.

[32] For example, warrants were issued by financial institutions, which consisted of a combination of financial derivatives that in effect copied the financial result of a zero-coupon bond. Returns on the latter were taxable, while the financial gains on warrants were not. Another example was the splitting-up of assets in a right of usufruct and bare property rights. When the right of usufruct expired, the bare property right rose in value, which was not taxable provided it was not business income. Anti-abuse legislation – in place to counter incentives to convert taxable capital income into non-taxable capital gains – became inapplicable (unnecessary) with the introduction of the 'box 3' system taxing notional yields.

Chapter 2.

Additional Policy Considerations in the Treatment of Capital Gains

This chapter reviews two policy considerations that were identified by a number of participating countries as important, where the investigation of possible capital gains tax effects is relatively complex and where reliance may be made on various analytical frameworks (economic models) to help guide policy thinking. In particular, this part of the study addresses possible influences of capital gains taxation on risk-taking by individuals (portfolio allocation between safe and risky assets), and on the cost of capital of firms and corporate financial policy. The analysis of risk-taking emphasizes potential discouraging effects of restrictive capital loss offset rules, while the analysis of possible effects on the cost of capital and firm financial policy points to the dependence of results on the tax treatment of the 'marginal shareholder'.

This chapter of the publication addresses two further policy considerations that were identified as important by a number of countries participating in the questionnaire exercise, where the analysis of possible capital gains tax effects is relatively complex and may involve economic modelling to guide policy making – possible effects of capital gains taxation on risk-taking by individuals (portfolio allocation between safe and risky assets), and possible effects on the cost of capital and corporate financial policy.

2.1. Possible capital gains tax (CGT) tax effects on risk-taking

As reviewed in this chapter and in some detail in Annex C, capital gains taxation may impact on risk-taking by individuals – that is, on the fraction of an investor's portfolio invested in assets with an uncertain and but possibly relatively high rate of return. While the 'popular' view tends to be that capital gains taxation will negatively impact (discourage) risk-taking, theory suggests that this need not be the case, depending largely on the tax treatment of capital losses. Seminal work in this area analyzing possible tax distortions to individual portfolio allocation between safe and risky-assets includes that of Domar and Musgrave (1944), Stiglitz (1969) and Atkinson and Stiglitz (1980).[1] A key finding is that capital gains taxation that provides symmetric tax treatment of capital gains and capital losses may *encourage* the amount of risk-taking in the economy, in effect by providing a risk subsidy.

A key element in the analysis of possible tax effects on risk-taking is the characterization of a representative investor's preferences for risk. The standard model assumes that utility (individual welfare) is increasing in wealth, but at a decreasing rate. With declining marginal utility of wealth, individual investors are risk averse, preferring a certain return on a safe asset to an uncertain return on a risky asset even where the expected returns are the same. Looked at somewhat differently, a risk averse investor is willing to pay a premium to avoid risk. The more risk averse an investor, the greater is the risk premium – that is, the lower is the certainty equivalent return on a safe asset that the investor is willing to accept (*i.e.* the larger is the amount that the investor is willing to pay) to avoid the uncertainty associated with a risky investment with the same expected return. (See Annex B.)

In the literature, decreasing absolute risk aversion is accepted as a 'normal' or representative case. With decreasing *absolute* risk aversion, an investor is predicted to increase his/her *level amount* of risky assets held as wealth increases. This assumption leaves open the question of whether investors would choose (in the absence of tax) to invest a higher *fraction or percentage* of their portfolio in risky assets at higher levels of wealth. Three cases may be distinguished: decreasing, constant, and increasing *relative* risk aversion. Constant relative risk aversion implies that a constant fraction of wealth is invested in risky assets at different levels of wealth, while decreasing (increasing) relative risk aversion implies that the fraction of wealth invested in risky assets increases (decreases) as wealth is increased.

An interesting and perhaps counter-intuitive result from the model is that introducing tax on interest and capital gains may lead to increased risk-taking – that is, to an increased percentage of wealth being invested in risky assets. However this result rests on the assumption that the government is a full partner with investors, sharing equally in capital gains and losses (*i.e.*, symmetric treatment, with losses deductible at the same effective rate applied to tax gains). In practice, governments typically constrain or 'ring-fence' loss claims (implying asymmetric treatment with less than full loss offset), which is shown to discourage risk-taking relative to the full loss offset case, at least in certain

cases. Such results encourage governments to consider the pros and cons of liberalizing capital loss claim provisions where those provisions are found to be overly restrictive. At the same time, it is important that deferral is accounted for when assessing the effective tax rate on capital gains.

Another interesting result is that a reduction in the effective capital gains tax rate, achieved either through a lowering of the statutory tax rate applied to gains/losses, or through partial inclusion, may have an ambiguous impact on risk-taking. This finding casts some doubt on arguments that would favour a capital gains tax reduction over more flexible loss treatment as a means of encouraging risk-taking in the economy.

The basic results found in the literature and reviewed below (and in greater detail in Annex C) are conditional in certain respects. First, they ignore possible implications to individual welfare of varying tax revenues under alternative tax schemes, implicitly assuming that government revenues are used to finance general public goods (entering the investors' utility function in an additive, separable manner). Second, the framework assumes that risk-taking is a rational exercise involving the weighing of wealth and substitution effects along the lines indicated by the model. In practice, tax considerations may factor into portfolio allocation decisions in other ways. Thus care must be taken in interpreting the implied policy considerations.

In considering the results, a central issue is whether the tax system should aim to encourage risk-taking relative to the no-tax case, or should aim instead to not discourage risk-taking from the level that would be observed absent taxation. Furthermore, where the aim of government is not to encourage risk-taking as an ultimate policy objective, but rather is to encourage the financing of activities believed to have social benefits (*e.g.* generate positive externalities, offset market failures), there remains the question of whether a more directly targeted policy instrument would be more appropriate.

a) Assessment of CGT effects where the safe return is nil (with full loss offset)

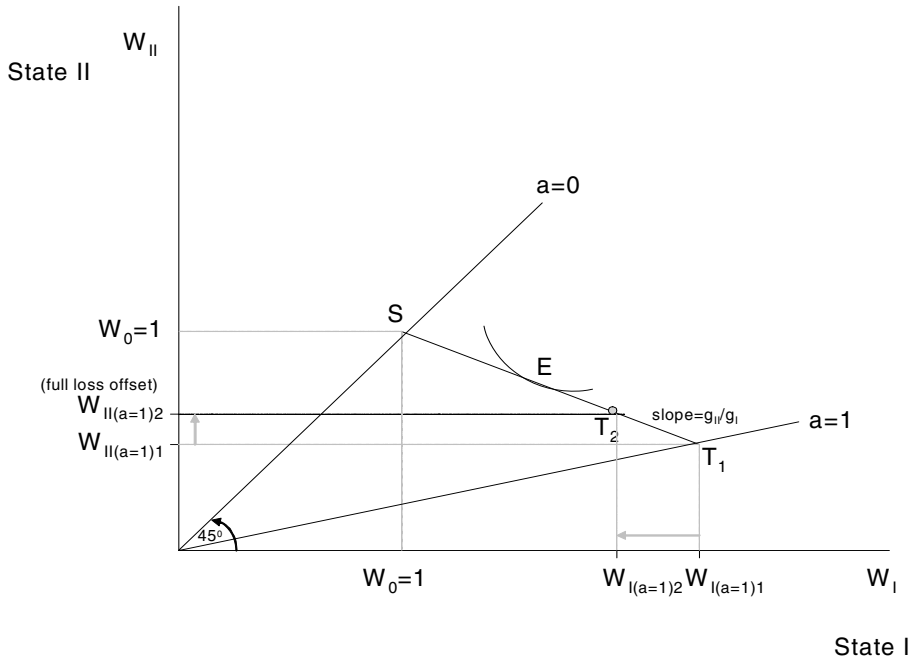
In assessing possible effects on risk-taking of taxing investment returns, the simplest case to consider is one where a safe investment pays no return. Where full loss offset is provided and an investor faces a choice between holding a safe asset paying no interest (*e.g.* cash), and investing in a risky asset with an uncertain return, the introduction of capital gains tax may be shown to increase risk-taking in the economy, measured by the fraction of wealth invested in the risky asset. The reason is that investors are able to maintain maximized terminal wealth by doing so. Investing a higher percentage of initial wealth in the risky asset involves no opportunity cost where the safe asset pays no return, while the government shares equally in capital gains in the 'good' state, and capital losses in the 'bad' state.

The possible impact on risk-taking of capital gains taxation with full loss-offset, where the safe asset pays a zero rate of return, can be analyzed with reference to Figure 2.1, where terminal wealth in the 'good' state I where capital gains are realized is measured along the horizontal axis; terminal wealth in the 'bad' state II where capital losses are realized is measured along the vertical axis; and "a" measures the fraction of initial wealth invested in the risky asset. Initial wealth (W_0) to be allocated between the safe and risky assets is taken to be one currency unit. The investor's portfolio allocation line (or budget line) in the absence of tax is ST_1.

Equilibrium demand for risk occurs in the model at the point where the expected increase in utility in the 'good' state at the margin from increasing the fraction of initial

wealth invested in risky shares generating capital gains, just equals the expected decrease in utility in the 'bad' state resulting from the same adjustment (with capital losses or more generally a return below the certain return on the safe asset). With a no-tax equilibrium at point E, the fraction of wealth invested in the risky asset is measured by the ratio SE/ST_1.

Figure 2.1.
Optimal Portfolio Allocation where the Safe Asset Pays No Return



Consider now the introduction of shareholder taxation at rate t, with reference to Figure 2.1 (where 1 in the diagram indicates the pre-tax period, and 2 indicates the post-tax period). If all wealth is held in the safe asset that generates no return (*e.g.* cash, in the absence of inflation), end-of-period wealth in both the 'good' state I and the 'bad' state II are unaffected by the introduction of a tax on capital income. Thus the point where the budget line crosses the locus of points where all wealth is held in the safe asset (the 45° line marked 'a=0') is unchanged at point S ($=S_1=S_2$) with terminal wealth equal to $W_0=1$ in both states. If instead all wealth is invested in the risky asset, terminal wealth declines in state I from $W_{I(a=1)1}$ to $W_{I(a=1)2}$, with tax paid on realized gains, while in state II where capital losses are realized, terminal wealth increases from $W_{II(a=1)1}$ to $W_{II(a=1)2}$, with the government sharing in realized losses. Thus the new post-tax end-point of the budget line for the position where all wealth is invested in the risky asset moves from T_1 to T_2.

Overall, the post-tax budget line is unchanged from the pre-tax line, except that it has contracted from ST_1 to ST_2 (where the line segment ST_2 is (1-t) times the length of ST_1). The indifference curve remains unchanged where investors' preferences are assumed fixed. Thus the equilibrium point remains unchanged at point E ($=E_1=E_2$).[2] However, the fraction of initial wealth invested in the risky asset is increased from SE/ST_1 to SE/ST_2. In other words, risk-taking, defined as the percentage of wealth placed in an asset with a risky (uncertain) return, has increased as a result of the introduction of taxation.[3]

It can be shown (see Annex C) that if demand for the risky asset without taxation is a^*, then the optimal demand for risk in the presence of tax is increased to $a^*/(1-t)$. In the good state I, the after-tax return is the same as in the no-tax case (a higher gross return but the same final or net return). Similarly, in the bad state II, with the government sharing equally in gains and losses, the pre-tax loss is greater, but with full capital loss offset, the after-tax return in the bad state is unchanged. In this sense 'private risk' is unchanged. The investor has the same expected end-of-period wealth, same consumption possibilities and same expected utility as in the no-tax case. However, by increasing the fraction of initial wealth invested in the risky asset from a^* to $a^*/(1-t)$, risk-taking in the economy has increased – where "risk" (social risk) is defined as the percentage of wealth placed in an asset with a risky/uncertain return.

b) General assessment of CGT effects with full loss offset

In the more general case where the safe asset generates a positive return, so that investing in risky assets carries an opportunity cost, wealth effects as well as substitution effects of a tax on investment returns are operative. As in the preceding case, equal sharing by the government in losses as well as gains encourages the investor to substitute towards the risky asset. However, if the wealth elasticity of demand for risky assets is positive – which would appear to be a reasonable assumption (*i.e.* that the *level* demand for risky assets increases as wealth increases) – the wealth effect of the tax on investment returns, which reduces expected terminal wealth, operates against the substitution effect of the tax. The incentive to portfolio adjust towards increased risk motivated by loss-sharing is tempered by the reduced net return (net of tax) on the safe investment – a consideration which is more discouraging to risk-taking the higher is the safe rate of return, and the higher is the wealth elasticity of demand for risky assets.

On balance, risk-taking measured as the percentage of wealth invested in the risky asset may *increase* with taxation of investment returns including gains with full loss offset provisions, under certain plausible scenarios including assumptions over the length of the holding period. For example, if the safe return is 5%, the tax rate on investment returns including gains is 25%, and the holding period is one year, the critical wealth elasticity value is 27.[4] That is, provided that the wealth elasticity of the demand for risky assets is less than 27, the model predicts increased risk-taking. If the tax rate is 50%, the critical elasticity value is η=41. If instead the holding period is roughly 25 years, so that the approximate interest rate in the one-period model is roughly 200% (r=2.0), the critical wealth elasticity value is about η=2.

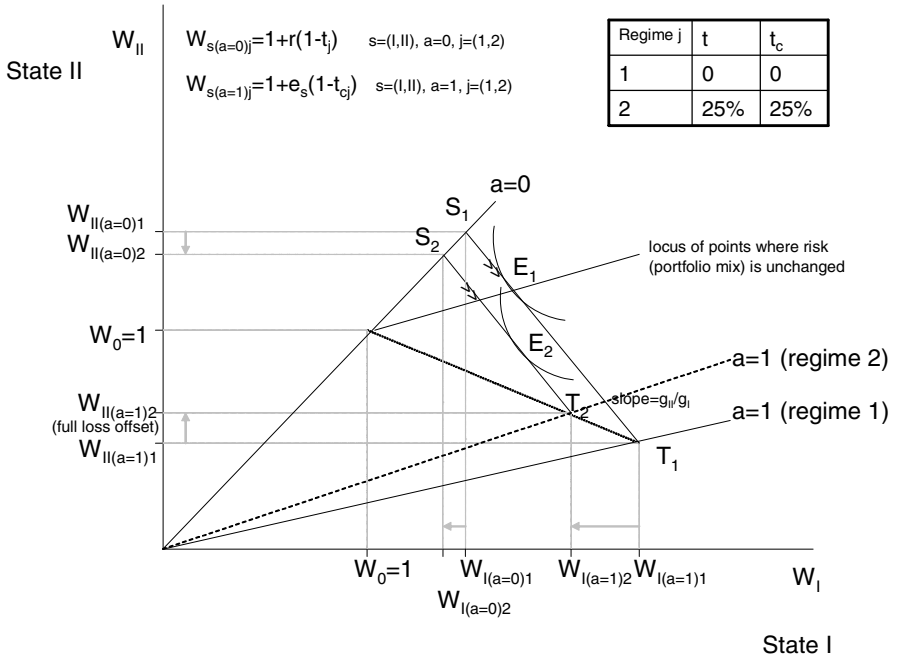
Atkinson and Stiglitz (1980) generalize the results for η^* and conclude that, under the assumptions of the model, taxing the risky return with full loss-offset increases risk-taking (the proportion of wealth invested in the risky asset) if the wealth elasticity of demand for the risky asset is not significantly greater than unity.[5] In other words, increased risk-taking may be predicted with increasing or constant relative risk aversion (*i.e.* a decreasing or constant fraction of wealth invested in risky assets as wealth increases), and also with decreasing relative risk aversion, provided that the wealth elasticity η is not too high.

As illustrated in Figure 2.2, the introduction of a tax on investment returns including capital gains that treats gains and losses symmetrically (*i.e.* full loss offset) shifts the portfolio allocation line inwards (reflecting decreased terminal wealth) in a parallel fashion (slope unchanged) from S_1T_1 in the absence of the tax, to S_2T_2, with a new post-tax equilibrium of E_2. The fraction of wealth invested in the risky asset is shown to

increase from S_1E_1/S_1T_1 to S_2E_2/S_2T_2. This result is characteristic of the case where the wealth elasticity of demand for the risky asset is positive and below some critical value η^* (as discussed above).

The striking result of the model is that introducing a tax on investment returns that treats capital gains and capital losses symmetrically may operate to increase risk-taking (*i.e.*, lead to a higher percentage of wealth being invested in risky assets). This result is derived under the assumption that capital gains are taxed as they accrue, and capital losses are deducted as they accrue (against capital gains and/or other taxable income) at the same tax rate as applied to capital gains, and that the wealth elasticity of demand for risky assets does not exceed a critical value varying with the holding period and safe rate of return.

Figure 2.2.
Optimal Portfolio Allocation – General Case with Full Loss Offset



c) Assessment of effects on risk-taking of (asymmetric) adjustments to the capital loss allowance rate

The preceding analysis assumes that capital gains and capital losses are treated symmetrically. In practice, this is generally not the case, with the effective tax rate on capital gains, and the effective tax rate at which capital losses are deducted, dependent on three main factors: the timing of recognition of gains and losses; inclusion rate (full or partial inclusion of gains/losses in the tax base); and the statutory tax rate applied to the relevant tax base to which capital gains/losses are assigned.

If capital gains were taxed as they accrue, symmetric treatment of an uncertain gain/loss would generally require that capital losses are deductible as they accrue, and that the

capital gains inclusion rate (full or partial) equals the capital loss allowance rate (full or partial allowance/inclusion of capital losses). Moreover, symmetric treatment would normally require that capital losses be deducted against the same tax base to which taxable capital gains are assigned (or more generally, a base subject to the same statutory tax rate as taxable gains). Where the taxpayer has insufficient taxable capital gains (or insufficient taxable income, depending on loss offset restrictions) to fully absorb allowable capital losses, symmetric treatment would require that the government provide the taxpayer with the cash or cash-equivalent value of unused capital losses (*i.e.* their value if currently claimed). A cash-equivalent value could be provided by allowing the taxpayer to carry forward excess capital losses with interest, to be set off against future taxable income.

As noted above, tax systems generally do not provide symmetric treatment of capital gains and capital losses. While OECD countries generally apply the same inclusion rate to realized capital gains and losses, taxable capital gains are normally drawn immediately into the tax net, while restrictions apply that can deny or postpone, without interest, deductions for allowable capital losses in excess of taxable capital gains. As reported in Table 2.1, some but not all OECD countries allow excess capital losses to be deducted against interest income, with fewer still allowing excess capital losses to be set off against non-investment (*i.e.* ordinary wage) income. Furthermore, while carry-forward (and in some cases carry-back) provisions are offered by a number of countries, generally one or more restrictions apply, and without an interest adjustment accompanying loss carry-forward claims (see Table 2.1).

The degree of symmetry, or lack thereof, in the treatment of capital gains/losses depends not only on tax rules on recognition, inclusion, and loss offset, but also on investor behaviour as regards the timing of asset sales and the scope within an investor's portfolio to minimize tax. In particular, while restrictions on loss claims tend to lower the effective tax rate at which capital losses may be deducted, at the same time deferral opportunities operate to lower the effective tax rate on taxable capital gains (the present value of the tax burden on gains falls as realization dates are deferred). Thus the extent to which the effective tax rate on capital gains exceeds (or possibly in some cases is less than) the effective tax rate applied to capital losses is an empirical issue, and may be expected to vary depending on the specific investor situation.

Extensions of the basic portfolio allocation model (detailed in Annex C) predict that taxation of capital gains at an effective rate that is higher than the effective rate at which capital losses are deducted can result in less risk-taking. Stiglitz (1969) and later Sandmo (1985) consider for example the effects of introducing an income tax on interest and capital gains that denies capital loss offsets, and show that for a sufficiently high tax rate, risk-taking would be predicted to decline relative to the no-tax case.

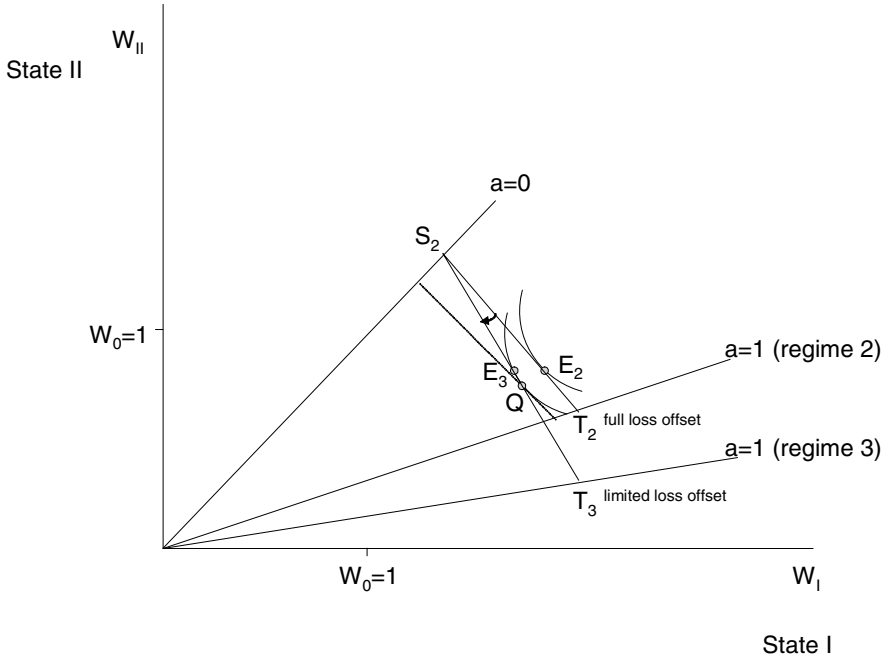
Another interesting case to consider is a tightening of capital loss allowance provisions without a symmetric reduction in the effective tax rate on capital gains. Annex C (section e) addresses a policy shock of this type, where an example might be limiting taxable capital gains or income types that capital losses can be offset against. As illustrated in Figure 2.3, this adjustment is predicted within the two-state model to unambiguously reduce the level of risk-taking in the economy, relative to a pre-reform level occurring under full loss offset.

Figure 2.3 depicts the predicted effects of restricting the capital loss allowance rate, where the pre-reform equilibrium is shown as E_2 (corresponding to the post-tax equilibrium E_2 in Figure 2.2). The policy adjustment to restrict loss offsets swings the

budget line inwards. As the reform does not affect the tax treatment of the safe asset, the point S_2 on the (a=0) locus where all wealth is invested in the safe asset remains unchanged. The end-point T_3 on the new (a=1) locus where all wealth is invested in the risk asset reflects an unchanged net return in the 'good' state I, but a reduced net return in the 'bad' state II with the government assuming less of the risk.

The new equilibrium is shown as E_3 on a new (lower) indifference curve. Q marks the point on the new indifference curve with the same slope as the pre-reform budget line S_2T_2. This distinguishes a wealth effect (E_2 to Q) and a substitution effect (Q to E_3). The former is predicted to be in the direction of reduced risk-taking (in the 'normal' case where the wealth elasticity of demand for the risky asset is positive, with the tax reform reducing terminal wealth in the bad state). The substitution effect is also towards less risk-taking, implying less risk-taking overall.

Figure 2.3.
Optimal Portfolio Allocation with Asymmetric Policy Adjustment
Limiting Capital Loss Allowance Rate



Conversely, providing greater scope for deducting capital losses without a corresponding increase in the effective tax rate on capital gains – for example, allowing excess capital losses to be deducted against a broader measure of taxable income, or increasing the capital loss inclusion rate relative to the capital gains inclusion rate – is predicted within the model to increase the degree of risk-taking. As reviewed in Annex C, the unambiguous result is found as the tax-reform is predicted to apply asymmetrically (affecting terminal wealth in the 'bad' state alone).

In considering possible policy implications, it is important to recognize that in practice very liberal treatment of capital losses may result in tax revenue losses, not picked up in the model, that are well outside the boundaries of what government might be willing to accept. In particular, with very generous capital loss provisions, taxpayers may

be encouraged to use the tax system to subsidize consumption activities which the government may not wish to support, through the tax system or otherwise.[6]

d) Assessment of effects on risk-taking of (symmetric) preferential treatment of capital gains/losses

Another interesting case to consider is where safe and risky returns are initially both taxed as ordinary income at the same tax rate, and the government decides to lower the effective tax rate on capital gains/losses. This could arise with a reduction in the statutory capital gains tax rate applied symmetrically to gains and losses, or with a reduction in the capital gains inclusion rate and a matching reduction in the capital loss allowance rate. For example, initially capital gains/losses may be included in the tax base in full (100% inclusion rate), and the government introduces partial inclusion (*e.g.* an inclusion rate of 50% for gains and losses).

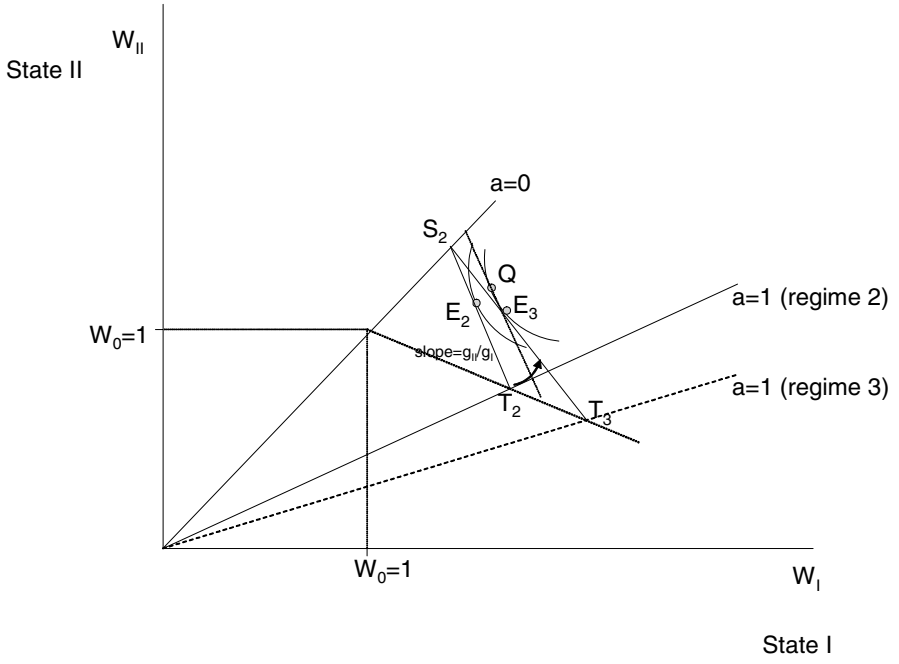
This case is illustrated in Figure 2.4, where the pre-reform budget line is S_2T_2 (this line matches that in Figure 2.2), and the pre-reform equilibrium is shown as E_2. The post-reform portfolio allocation line is shown as S_2T_3. As the taxation of interest income is unaffected by the policy change, the end-point S_2 on the (a=0) locus where all wealth is invested in the safe asset is unchanged. With the reduction in the effective tax rate on capital gains/losses, the budget line becomes less steep, with a new end-point T_3 on the new post-reform (a=1) locus where all wealth is invested in the risky asset. The reduction in the effective tax rate means a higher after-tax return and terminal wealth in the 'good' state I where gains are realized, but a lower net return in the 'bad' state II with less tax relief in respect of capital losses.

Figure 2.4 depicts the case where the policy adjustment leads to increased risk-taking, comprising a wealth effect from E_2 to point Q on a higher (post-reform) indifference curve with increased terminal wealth (reflecting a high probability assigned by the investor to earnings gains as opposed to losses) and a substitution effect in favour of increased risk-taking, from point Q along the new indifference curve to a post-reform equilibrium E_3.

However, as detailed in Annex C, the overall impact on risk-taking of this policy reform is not certain in the model under 'normal' risk assumptions. The change in the capital gains/loss inclusion rate alters the relative net rate of return on risky versus safe assets. In so doing, the reform introduces substitution effects not present when introducing tax on, or adjusting the rate of tax applied uniformly to, investment returns including capital gains/losses and interest addressed in sub-section b).

Unlike the reform to the loss claim parameter, addressed above, the shock to the capital gains/loss inclusion rate and thus the shock to the relative tax rate applies symmetrically (in both states). Tax payments are lower when investing in the risky asset and expected utility higher in the 'good' state where gains are realized, with an opposite outcome in the 'bad' state where the subsidy to risk is lower. The net effect of these considerations leaves unclear the implications overall.

Figure 2.4.
Optimal Portfolio Allocation with Policy Adjustment
From Full to Partial inclusion of Capital Gains and Losses



In general, a reform that lowers the gains/loss inclusion rate is more (less) likely to increase risk-taking the higher (lower) is the probability assigned to the 'good' state, and the less (more) risk averse is the investor. However, unlike other reforms reviewed above, the net impact of income and substitution effects resulting from a reduction to the capital gains inclusion rate matched by a reduced capital loss allowance rate cannot be unambiguously derived without stronger assumptions over the risk-preferences of the investor and probabilities assigned to the two states occurring.

In summary, a central implication of the basic portfolio allocation model of Domar and Musgrave (1944), Stiglitz (1969) and Atkinson and Stiglitz (1980), is that capital gains taxation may increase risk-taking, under certain designs and conditions, with the treatment of capital losses being a key consideration. A main finding is that the introduction of a tax on investment returns including capital gains with full loss offset may lead to increased risk-taking relative to the no-tax case, under plausible assumptions over risk preferences. Another result from the model is that risk-taking will increase (decrease) if the government adjusts policy to liberalize (restrict) its capital loss allowance rules, while leaving the effective tax rate on capital gains unchanged. Furthermore, a symmetric adjustment to the effective tax rate applied to capital gains and losses (*e.g.* a symmetric adjustment to the capital gains inclusion rate, and capital loss allowance rate) may impact risk-taking in certain cases, but with effects less certain than an asymmetric adjustment to the capital loss offset rate.

These findings may encourage analysts to consider whether restrictions on capital loss offsets are in order. On this point, an important consideration is that, in practice, the effective tax rate on capital gains may not differ significantly from the effective tax rate at which capital losses can in fact be deducted, despite restrictions on capital loss offsets.

As noted previously, the degree of possible asymmetry in the treatment of capital gains and losses depends not only on statutory provisions governing capital loss offsets, but also on tax planning opportunities. Evidence is reported in the country responses of patterns of dispositions that take advantage of the flexibility afforded investors under a realizations-based system -- and in particular the ability to choose the date of gain/loss recognition by choosing the year of asset disposition.

Taxes may be minimized, for example, by selling assets (*e.g.* shares) with accumulated gains just sufficient to fully absorb deductions taken on capital losses on the sale of loss-producing assets (and then repurchasing the capital gains assets if desired). A strategy of deferring recognition of taxable capital gains, while selling capital gains-producing assets just sufficient to claim relief for capital losses, tends to lower the effective tax rate on capital gains, while increasing the effective tax rate at which losses are deducted. Thus for certain investors, the effective tax rate at which capital losses can be deducted may not be less than (and may well exceed) the effective tax rate on gains. However, for other investors with less diversified portfolios, limited deferral possibilities, and more generally fewer opportunities to tax plan, restrictions on loss claims may mean that the effective tax rate at which capital losses are deducted is less than the effective tax rate applied to gains (the situation examined in sub-section c). The implications for the economy overall would obviously be complex to sort out, implying a difficult empirical issue.

A further consideration is that the introduction of very liberal capital loss allowance provisions (*i.e.* with few restrictions on income types that can be offset by capital losses) could be expected to invite another form of tax planning both difficult and expensive to administer and contain. As previously noted, very generous loss offset provisions may encourage investors to characterize certain consumption activities as business activities to obtain tax deductions for consumption expenses, a clearly unintended result where a policy intent behind more liberal treatment of capital losses is to encourage risk-taking in investment (as opposed to consumption) activities. In other words, full loss offset might result in practice in a subsidy for certain consumption items (*e.g.* hobby farms) which the government may not wish to target through the tax system or otherwise, with such an outcome not picked up in the simple portfolio model.

Furthermore, while the findings from the basic portfolio model are interesting and noteworthy, it must be recognised that the basic one-period portfolio allocation model and the results drawn from it are based on a number of assumptions. One is that the investor faces a choice between a safe asset and a single risky asset. This raises the question of whether the general findings carry over to the case of many assets. An extension of the analysis to the case of an arbitrary number of risky assets, considered by Sandmo (1977), shows that the results of the two-asset model do indeed carry over without modification.[7]

Cleary, however, the results are conditional in a number of respects. Perhaps most importantly, the results ignore possible implications to individual welfare of varying tax revenues under alternative schemes, implicitly assuming that government revenues are used to finance general public goods (entering the investors' utility function in an additive, separable manner). Recent theoretical work emphasises that an assessment of capital gains taxation on risk should address the possibility that shifting risk to government (*e.g.* through loss offsets) may not be costless.[8] Loss claims impart random effects on government revenues, and thus on public spending, borrowing and tax policy.

Thus it may be that risk to government revenues is costly to bear for individuals as are privately traded risks (as private individuals must ultimately bear the risks to public

revenues). Presumably in some cases there would be some netting or cancelling of these effects throughout the economy (with the loss incurred by one taxpayer offset, to some extent, by a gain realized by another). However, the importance of this consideration and more generally the net costs of shifting risk to government need to be weighed and may differ substantially from one country context to another.

Business assets considered in Table 2.1 (and Tables 1.1 and 3.1) are business assets not held as part of trading stock.

Another central issue, flagged at the outset, is whether the tax system should encourage risk-taking relative to the no-tax case – not as an objective in itself, but rather to encourage activities that generate positive spill over benefits and are generally higher risk. This raises questions over positive externalities of certain higher-risk activities, questions over to whom these externalities might accrue, as well as questions over types and sources of market failure, and whether, if found, should be addressed through the tax system or through some more targeted device.[9] Exploring these issues is well beyond the scope of the current study.

Finally, one might add that the framework used to derive the above-noted basic results assumes that risk-taking is a rational exercise involving the weighing of wealth and substitution effects along the lines indicated by the model. In practice, tax considerations may factor into portfolio allocation decisions in other ways. Thus care must be taken in interpreting the implied policy considerations.

e) Country assessments of CGT effects on risk-taking

The questionnaire asks countries whether possible influences of capital gains taxation on risk-taking by households are taken into account when setting tax policy, and if so, how such influences are factored in. It also asks countries to report on their 'ring-fencing' rules governing capital loss claims (including capital loss carry-forward/back provisions, and whether excess capital losses can be set-off against investment and/or ordinary income), with main provisions summarized in Table 2.1 and discussed in section 3.3.

Potential impacts of tax reform on risk-taking are analysed in Norway using capital asset pricing models (CAPM) and option pricing models. Norway explains that one of the main objectives of the major tax reform in 1992 introducing the RISK system (with single taxation of dividends (full imputation credits) and capital gains (step-up in share basis)) was to introduce neutral taxation of capital income that would not be expected to influence financing and investment decisions, nor impact risk-taking behaviour. As a general rule under this system, capital losses may be set off against capital gains as well as all taxable income from employment, business and capital.

Table 2.2.
Offset Provisions for Capital Losses on non-business assets (CL) and Capital Gains on non-business assets (CG) (as of 1 July 2004)

Country	Restrictions on CL deductions against CG?	CL deductible against other income/gains?	Losses other than CL deductible against CG?	CL carry-forward and/or carry-back?
Australia	Yes. CL on collectables deductible only from CG on collectables. No CL on personal use assets. Otherwise, no restrictions.	No. CL may be deducted only against CG.	Yes. Ordinary tax losses are deductible against any income, including taxable CG.	Yes. Indefinite carry-forward (no carry-back)
Austria	Yes. CL deductible only against CG of the same category. CL on "speculative transactions" (securities held < 1 year) deductible only against CG on same category. CL on "substantial shareholding" deductible only against CG on same category.	No	Yes. Non-capital losses (*e.g.* business losses) first deducted against income of same category and then may be deducted against all other categories.	No
Belgium	No. Aggregation of taxable CG and allowable CL (no separate pooling of CG/CL within 'miscellaneous' income category).	No	No	Yes. Immovable property: 5 year carry-forward. No carry-forward (or carry-back) for CL on substantial shareholding.
Canada	Yes. CL on listed personal property (*e.g.* art, jewellery) deductible only against CG on listed personal property. Otherwise, aggregation of taxable CG and allowable CL.	Yes. 50% of CL on shares and/or debt of a qualifying small business corporation deductible against CG and taxable income from any source ('allowable business investment loss' rules). 50% of CL occurring in or carried forward to year of death may be deducted against taxable income from any source in year of death and immediately preceding year.	Yes. Ordinary business losses deductible against income from any source, including taxable CG.	Yes. Indefinite carry-forward and 3 year carry-back.
Czech Republic	Yes. Separate treatment of CL/CG on securities (*e.g.* shares, bonds), and CL/CG on ownership interests in limited liability company, partnership or cooperative (*e.g.* CL on latter cannot be deducted against CG on securities).	No	No	No

Table 2.2.
Offset Provisions for Capital Losses on non-business assets (CL) and Capital Gains on non-business assets (CG) (as of 1 July 2004)

Country	Restrictions on CL deductions against CG?	CL deductible against other income/gains?	Losses other than CL deductible against CG?	CL carry-forward and/or carry-back?
Denmark	Yes. Separate treatment of CL/CG on quoted shares and on immovable property (CL deductible only against CG on similar property). CG on unquoted shares deductible against personal income. No CL deduction for bonds (both recognized and unrecognized bonds).	Yes. CL on shares (quoted & unquoted) held ≥ 3 years deductible against 'income from shares' which includes dividend income. Unused losses transferable to spouse.	No	Yes. Indefinite carry-forward (against CG and/ other income, as under basic pooling rules).
Finland	No. Aggregation of taxable CG and allowable CL.	No. CL deductible only against CG.	Yes. Net CG is included in 'income from capital', which may have negative components.	Yes. 3 year carry-forward.
France	Yes. Separate treatment of CL/CG on securities, and on immovable property (CL deductible only against CG on similar property).	No	No	Yes. 10 year carry-forward for CL incurred from occasional sale of shares (deducted against CG of the same type).
Germany	No. Allowable CL on non-business (privately-held) assets may be deducted against taxable CG on non-business assets. Cf. 50% inclusion rate for CG/CL on securities.	No	Yes. Net CG may be reduced by non-capital losses.	Yes. Indefinite carry-forward, but amount limited: unlimited up to € 1 million of positive income of the year of deduction, above that amount limited to 60 % of the positive income of the year of deduction. Also, 1-year carry-back for CL up to €511,500.
Greece	Yes. Separate treatment of CG/CL taxed at separate scheduler rates.	Sole proprietorship can set off gains against losses from the selling of shares of companies registered in the Greek or in any foreign stock market.	No	Yes. No time limitation.
Hungary	Yes. Separate treatment of CG/CL taxed at separate scheduler rates.	No	No	No
Iceland	Yes. Separate treatment of CG/CL on movable property including shares, and immovable property.	No. CL on securities deductible against CG on similar assets in same year. CL on immovable property deductible against CG on similar assets in same year.	No	No

Table 2.2.
Offset Provisions for Capital Losses on non-business assets (CL) and Capital Gains on non-business assets (CG) (as of 1 July 2004)

Country	Restrictions on CL deductions against CG?	CL deductible against other income/gains?	Losses other than CL deductible against CG?	CL carry-forward and/or carry-back?
Ireland	Yes. CG on certain disposals of development land (subject to separate CGT @ 40% rate) ring-fenced from other CL. Otherwise, pooling of CG and CL.	No. CL may not be deducted against other income (CL deducted only against CG).	No	Yes. Indefinite carry-forward. If CL arises in the fiscal year in which a taxpayer dies, CL may be carried back 3 years (on a LIFO basis).
Italy	Yes. Separate pooling of CG/CL on qualified (substantial) shareholdings; and on other CG/CL (*i.e.* on non-qualified shareholdings, bonds, other assets).	No	Yes. Investment losses may be set-off against net CG on non-qualified shareholdings.	Yes. 4-year carry-forward for *i)* CL on qualified shareholding, and *ii)* CL on non-qualified shareholding.
Japan	Yes. Separate pooling of CG/CL on securities (taxed separately at flat rate), real property (land, buildings) held short- and long-term, and other assets.	No. Exception: CL on sale of residential property may be deducted from total income of next 3 years (limited to years in which total income is ≤ ¥ 30 million) under certain conditions.	Yes. Non-capital losses may be set-off against net CG on assets other than securities, real property (both subject to separate taxation).	Yes, in certain cases. 3-year carry-forward for CL on quoted shares (to offset against CG on quoted shares). No carry-forward/back for CL on securities, land or buildings.
Korea	Yes. Separate pooling of CG/CL on shares (CL on shares deductible only against CG on shares in the same year) and buildings & land (CL may be set off only against CG on buildings & land in same year.)	No	No	No
Luxembourg	No. Separate pooling of *i)* speculative CG/CL (securities held < 6 months), *ii)* CG/CL on real assets, *iii)* CG/CL on substantial participations. Balances are netted in specified order to determine applicable tax rates.	No	Yes. Non-capital losses may be set-off against net CG.	No
Mexico	No. Aggregation of taxable CG and allowable CL.	Yes. CL may be deducted against other taxable income.	No	Yes. 3-year carry-forward.

Table 2.2.
Offset Provisions for Capital Losses on non-business assets (CL) and Capital Gains on non-business assets (CG) (as of 1 July 2004)

Country	Restrictions on CL deductions against CG?	CL deductible against other income/gains?	Losses other than CL deductible against CG?	CL carry-forward and/or carry-back?
Netherlands	No. Aggregation of taxable CG and allowable CL on all substantial shareholdings (included in 'Box II").	Yes. CL (on substantial shareholding) may be deducted against any other income (*e.g.* dividends) from a substantial shareholding. Also, 25% of excess CL on substantial shareholding may be carried forward to be set against other income in the case where shareholder loses his/her substantial interest.	Yes. Box II investment losses may be deducted against Box II CG.	Yes. 3-year carry-back, indefinite carry-forward (of CL on substantial shareholdings).
New Zealand	No. All corporate bonds are treated equivalently under accrual rules (no separate pooling of CG/CL).	Yes. Losses on bonds are fully deductible against current income.	Yes. Net CG taxed as part of personal income (may be offset by other losses).	Yes. Indefinite carry-forward.
Norway	No. Aggregation of taxable CG and allowable CL (included in 'ordinary income', which comprises all taxable income from employment, business and capital).	Yes. CL deductible against all ordinary income.	Yes. Non-capital losses are deductible against CG.	Yes. 10-year carry-forward. 2-year carry-back for CL on business assets when a business is terminated.
Poland	Yes. Separate treatment of CG/CL on shares and other securities (taxed @ 19% flat rate), and 'income from sale of immovable property, property rights, and movables' taxed on gross basis (sales price less costs of sale).	No	No	No
Portugal	Yes. Separate treatment of CG/CL on shares and other securities, and CG/CL on immovable property. Net CL on equity shares and other rights can only be deducted against net CG of same type realized in the following 2 years. Net CL on immovable property can only be deducted against net CG of same type realized in the following 5 years.	No (note that CL on business assets are deductible against other business income).	No	Yes. 5-year carry-forward for CL on immovable property. 2-year carry-forward for CL on shares and other securities.
Slovak Republic	Yes. Separate treatment of CG/CL on securities, (other) movable assets, and immovable property.	No	No	No

Table 2.2.
Offset Provisions for Capital Losses on non-business assets (CL) and Capital Gains on non-business assets (CG) (as of 1 July 2004)

Country	Restrictions on CL deductions against CG?	CL deductible against other income/gains?	Losses other than CL deductible against CG?	CL carry-forward and/or carry-back?
Spain	Yes. Separate treatment of short-term CG/CL (on securities held < 1 year), and long-term CG/CL. (Short term CL may set-off against short-term CG of the same year (may not be set off against long-term CG). Long term CL may be set off (only) against long-term CG of the same year.)	Yes. Excess short-term CL (after set-off against short-term CG) may be deducted against 10% of other net income (excluding long-term CG)	Yes. Business losses are deductible against net short-term CG (taxed as ordinary income)	Yes. 4-year carry-forward for unused short-term CL, to be set off against short-term CG or 10% of other net income (excluding long-term capital gains). 4-year carry-forward for long-term CL to be set-off against long term CG.
Sweden	Yes. Separate treatment (ring-fencing) of CG/CL on shares in mutual funds that hold only Swedish debt claims. Otherwise, aggregation of taxable CG and allowable CL. Cf. Varying CL inclusion rate for different assets: 100% for Swedish debt claims (excluding premium bonds) and shares in mutual funds holding Swedish debt claims; 50% for personal residence; 70% for all other CL.	Yes. 70% of any excess CL may be set-off against other capital income (including. interest and dividends). If capital income is negative, 30% of CL up to Skr 100,000 (10810€) and 21% of CL loss exceeding Skr 100,000 may be set off against tax on earned income (employment income plus business income).	Yes. Investment losses are deductible against CG (in calculating income from capital).	No
Switzerland	NA. No federal capital gains tax on private movable or immovable property (federal tax only on CG/CL on business assets) Cf. Capital gains tax on private immovable property at the cantonal level.	NA	NA Cf. In some cantons, business losses may be set off against CG on private immovable property.	NA
Turkey	No. Aggregation of taxable CG and allowable CL.	No	No	Yes. 5-year carry-forward.
United Kingdom	No. Aggregation of taxable CG and allowable CL. Exception: CL on disposal to "connected person" may be set-off only against CG on a disposal to the same person.	No Exception: CL on qualifying shares in unlisted trading company may be set-off against income of current year or proceeding tax year.	Yes. Trading income losses (which cannot be set-off against income) may be set-off against any CG, subject to conditions.	Yes. Indefinite carry-forward. No CL carry-back, except where CL arises in year taxpayer dies, or in year where mineral lease ends.

Table 2.2.
Offset Provisions for Capital Losses on non-business assets (CL) and Capital Gains on non-business assets (CG) (as of 1 July 2004)

Country	Restrictions on CL deductions against CG?	CL deductible against other income/gains?	Losses other than CL deductible against CG?	CL carry-forward and/or carry-back?
United States	No. Aggregation of taxable CG and allowable CL. Excess CL on securities held ≤ 1 year) may be set-off against net CG on securities held > 1 year; excess CL on securities held > 1 year may be set-off against net CG on securities held ≤ 1 year).	Yes. Excess CL (which cannot be set-off against CG) of up to USD 3000 may be set-off against ordinary income.	No	Yes. Indefinite carry-forward.

Source: 1) Questionnaire responses provided by Australia, Canada, Czech Republic, Denmark, Finland, Germany, Iceland, Ireland, Italy, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Portugal, Slovak Republic, Spain, Sweden, United Kingdom, United States; 2) European Taxation Database and European Tax Handbook (2004), International Bureau of Fiscal Documentation.

Similarly, in the decision to replace the RISK system with the 'shareholder model' (beginning in 2006), possible impacts on risk-taking were taken into account. Under the 'shareholder model', aimed largely at reducing incentives present under the RISK system to have earned income taxed as capital income, above risk-free returns are taxed at both the corporate and personal level. However, returns below this level are tax free at the personal level (taxed only at the corporate level), combined with carry-forward provisions for any unused 'tax-sheltered returns' (see Sorensen (2003) for a description of the shareholder model). When considering the design of this new system, possible impacts on risk-taking were analyzed. The analysis found that a system which shields from personal income tax the risk-free opportunity return of an investment, combined with carry-forward and full loss-offset provisions for unused 'tax-sheltered returns' might have a positive effect on risk-taking for less diversified investors (*e.g.* entrepreneurs). However, as the chosen system deviates somewhat from such a system, there are effects working to both increase and decrease risk-taking. Thus, taxation under the shareholder model was not expected to have any major net effect on risk-taking.

In the U.S., up to $3000 (USD) of excess capital losses (losses which cannot be set-off against capital gains) may be set-off against ordinary income (while there have been several proposals to increase the $3,000 limit, none have been enacted). The effects of capital gains tax rates on incentives for risk-taking are commonly included among the rationales for a preferential tax rate for capital gains. In this context, the argument is that because the deduction of capital losses against other income is limited and individual income tax rates are progressive, the tax system would otherwise be biased against risky investments. The 1940s Musgrave model is sometimes used as a starting point, but this model assumes unlimited deduction of losses and a proportional income tax.

It is sometimes argued that investments in new start-up businesses are more risky than investments in larger, established firms. In 1993, this concern in the U.S. led to the enactment of a 50% exclusion and a maximum tax rate of 14% for new investments in certain small business stock purchased at original issue and held for at least 5 years. The business must have less than $50 million in assets (including the proceeds of the stock sale) at the time of issue and meet a number of other requirements. Under current law, this provision which remains in the law provides very little tax benefit compared to other capital gains tax rates.

Ireland reports that in designing its capital gains tax system implemented in 1974-1975, effects on risk-taking factored into the decision to apply a low 26% tax rate to taxable capital gains, considerably lower than the top rates of personal and corporate income tax in effect at that time. In addition, special attention was paid to the tax treatment of losses. In particular, Ireland allows *aggregate* capital losses (on all chargeable assets) to be set off against aggregate capital gains other than gains on development land (*i.e.* generally no categorisation or ring-fencing of capital gains and losses by type). To further avoid possible negative effects on risk-taking that adoption of a capital gains tax might have, rollover relief was provided (such relief has since been abolished).

Sweden notes that in the analytical work underlying the different tax rules applied during the 1990's, no detailed examination of the possible effects of taxation on risk-taking is evident. However, debate over the general design of tax policy stressed the importance of symmetric treatment of capital gains and losses in order to not curb risk-taking. Additionally, one area where risk considerations directly influenced tax policy was in relation to so-called 'structural investments' in closely-held corporations. In

particular, rollover relief was provided for share-for-share exchanges to address risk considerations and facilitate such investments.

New Zealand reports that, in considering whether or not to tax capital gains, impacts on risk-taking are analyzed within a framework that takes maintaining investment decision neutrality as a policy objective (investment decisions should be based upon market factors alone, not tax considerations). In the context of risk taking, an investor's preference for risk should not be altered by tax considerations. That is, the taxation of capital gains should not, in theory, create a disincentive (or incentive) to invest in risky assets.

New Zealand notes that with full loss-offset, a capital gains tax should have a positive effect on investment in risky assets, at least to the extent that this allows risks to be spread that would not be spread by normal market forces. This is because the government becomes, in essence, a silent partner in the venture. If the venture succeeds, the government reaps a higher return from taxing a greater capital gain. If the venture fails, the investor immediately claims the loss as deductible against other income, pays less tax, and so shares its loss with the government. As the government is sharing the risk, an investor will now be taking less risk than they were prepared to take. Consequentially, they will be prepared to increase their investment in risky assets.

However, in practice taxing capital gains creates an incentive to defer the gains on assets that have increased in value, and to immediately realise losses on assets that have fallen in value. This tax-planning incentive creates a risk to the tax base. This could be avoided by taxing capital gains on an accrual basis, however this is likely to be inaccurate and have high compliance costs associated with it. A common approach observed in practice to address this distortion and protect the tax base is to ring-fence capital losses so that they can only be deducted against similar income (taxable capital gains).[1] In effect, the government is then fully taxing the profits of risk taking, while not fully compensating for the losses. This reduces the expected return of the investments and creates a bias away from riskier assets (although to a lesser extent than allowing no deductions for losses at all), implying reduced risk-taking relative to the no-tax case. Give this, having no comprehensive capital gains tax is seen in New Zealand as minimising the influence of tax considerations in risk taking. This is identified as having been considered a significant factor in the overall decision to not tax capital gains.

The approach in the U.K. has been to identify specific 'business assets' (rather than focusing on risky assets, *per se*) and to attempt to encourage investment in these by providing more favourable tax treatment. Targeted assets are those for which underinvestment is likely, due to positive externalities not captured by the investor, or other market failures such as information asymmetries.

The U.K. explains that its CGT system allows certain losses on the disposal of shares in qualifying unquoted trading companies to be set off against ordinary income. This is in addition to the general treatment allowing capital losses to be set off against current capital gains and future capital gains under loss carry forward provisions. Taper relief in the U.K. is designed to encourage investment in business assets including assets used for a trade, shares in unquoted trading (as defined) companies, and most employee shareholdings in their employer.

Furthermore, a capital gains tax exemption is provided in respect of certain investments in new high-risk shares in small-and medium-sized enterprises. In particular, the Enterprise Investment Scheme (EIS) provides an exemption on the disposal of shares

in an EIS company if certain conditions are met, and allows tax on a gain on any asset to be deferred against a qualifying investment in an EIS company. And the Venture Capital Trust Scheme exempts under certain conditions gains on shares in a company investing in small unquoted companies. Lastly, the normal CGT charge is rolled-over (deferred) when certain business assets, including shares in unquoted trading companies, are given away or the proceeds are reinvested in new qualifying assets.

In Australia, the pros and cons of alternative tax policy strategies are addressed within an economic framework that involves quantitative as well as qualitative elements including consultations with stakeholders on possible effects including risk-taking. One reason behind Australia's decision to preferentially treat capital gains (half inclusion rate) was recognition of the generally riskier nature of capital investment.

Policy-makers in Spain considered that taxing long-term capital gains at a preferential (proportional) rate, rather than at ordinary (progressive) personal income tax rates, would boost investment in risk-taking activities. The tax treatment of capital gains in Canada, where only one-half of realized capital gains in included in income for tax purposes, recognizes that including the full amount may have several undesirable results, including a reduction in risk-taking.[11] Also, tax on capital gains on eligible small business investments can be deferred if the proceeds are reinvested in other small business investments. Third, the taxation of capital gains realized in savings plans and registered savings plans is generally deferred until money is withdrawn from the plan.[12]

The decision by the Czech Republic to provide a tax exemption for tax capital gains on securities held for more than 6 months was based on a qualitative assessment that such treatment would encourage long-term investment and discourage short-term speculative transactions. A decision to ring-fence capital losses was taken to avoid excessive risk-taking, while at the same time address tax avoidance possibilities.

Denmark, Finland and Germany indicate that risk-taking considerations traditionally have not been taken into account when deciding capital gains tax policy. Nor are they in the Netherlands, although Dutch authorities explain that there are no specific reasons for not taking this aspect into account.

2.2. Possible capital gains tax effects on the cost of capital and corporate financial policy

In addition to influencing the portfolio choice of households, different personal tax rates on interest, dividends and capital gains may also impact firm-level decisions, including corporate distribution policy, and corporate financial policy by impacting the cost of capital. Where the tax rate on capital gains is low relative to the tax rate on dividends, for example, corporations may be discouraged from distributing profits in the form of dividends, and may aim to rely on share repurchases instead. Where share repurchases are limited and corporate profits are retained due to tax considerations, negative implications for the efficient allocation of capital may result.

Capital gains taxation may influence corporate financial policy by affecting the relative cost of alternative sources of finance (debt, retained earnings and new share issue), depending on the tax treatment of the 'marginal shareholder'. The following summarises in section a) possible capital gains tax effects on the cost of capital, corporate financial policy and investment, with country assessments of such effects discussed in section b). Supplementary analysis is found in Annex D.

a) Review of possible effects

Shareholder taxation of investment returns, including capital gains, may affect the financing behaviour of firms and raise policy concerns in certain cases.[13] For example, a relatively high effective capital gains tax rate may exacerbate a tax distortion favouring debt finance tied to interest deductibility, and give rise to concern if corporate debt/asset ratios are relatively high, raising the spectre of instability in financial markets.[14]

Under the so-called 'bankruptcy model' of corporate financial policy, the after-tax cost of debt finance is generally the cheapest amongst alternative main sources of capital (debt, retained earnings, new equity), at least for low debt/asset ratios, owing to the tax deductibility of interest. This tends to make debt finance relatively attractive compared with equity finance, at least for profitable firms able to claim an interest deduction. As the debt/asset ratio increases, the interest rate charged to a firm eventually rises, reflecting increased risk to creditors that the firm's cash-flow will be insufficient to cover its interest expense. In minimizing a firm's cost of funds, managers could be expected to borrow additional amounts to fund additional investment until the after-tax interest rate on borrowed funds at the margin just equals the flow cost of retained earnings, generally the next least expensive source of finance, under the 'normal' case where the effective capital gains tax rate is less than the dividend tax rate.[15] In this model, introducing or increasing the rate of capital gains tax could be expected to increase the debt/asset threshold at which retained earnings become a cheaper source of finance compared to bonds.

Aside from possible concerns over financial market instability aggravated by tax distortions, tax systems or reform efforts that tend to favour debt finance may also raise concern where preferences exist for increased reliance on domestic equity over international bond markets to finance domestic investment. More generally, depending on the relative tax treatment of capital gains, dividends and interest, tax rules may distort firms' choices over alternative sources of finance in funding investment plans, and lead policy-makers to consider whether a more neutral tax treatment might be desirable.

In addition to distorting choices over alternative marginal sources of funds, shareholder taxation of investment returns may influence corporate decisions over how much investment to undertake, recognising the need for returns on investment to cover financing costs. In other words, capital gains tax policy, as with dividend tax policy, may influence the level of investment undertaken and not simply the mix of funds used to finance it, by influencing the weighted-average cost of funds. Reducing the tax rate on equity returns including capital gains, for example, may lead to increased investment to the extent the reform lowers the cost of capital used to finance additional investment.

A further possibility is that the relative setting of the capital gains tax rate may impact the timing (as opposed to level) of investment. Where domestic shareholder taxes are capitalised in share prices, retained earnings generally would be the least expensive source of equity capital, compared with new share issue, if the effective tax rate on capital gains is below the effective tax rate on dividends. The effective capital gains tax rate may be low on account of statutory provisions (*e.g.* a preferential statutory tax rate applied to taxable capital gains, or partial inclusion in the tax base), or on account of deferral, or both. As a result, managers may be discouraged from raising new equity to finance a given project, preferring to rely on current and future profit retentions. In other words, investment projects may be delayed in some cases where capital gains tax rules encourage growth through reliance on retentions and delay or discourage raising new equity funds.

Predictions over possible effects of capital gains taxation on the cost of capital depend on whether (and the degree to which) domestic capital gains taxes are capitalized into equity share values, and where they are, the tax treatment of the 'marginal shareholder' – recognising that most systems tax different shareholders differently. Results from the tax capitalisation model emphasising domestic shareholder tax effects may be expected to apply in situations corresponding more closely to the closed-economy case (*e.g.* start-up financing relying on local investors), where taxable domestic savers are the marginal providers of funds. In this context, personal tax rates on capital gains and dividends may be expected to factor into a firm's discount rate, influence the market value of firms, and affect investment behaviour.

Where tax-exempt institutional investors such as pension funds play a dominant role in investing household savings, the potential influence of personal tax rates on the cost of capital would be expected to be less likely. A related central consideration is the openness of capital markets. In the 'open economy' case where domestic firms have unfettered access to international equity markets, one would not expect domestic shareholder tax rates to systematically factor into the cost of funds or firm financial or investment policies (the exception being the case where the economy is sufficiently large to influence the international cost of funds through capital supply effects).

With capital markets becoming increasingly open, integrated and global, the closed economy framework and neutrality results derived from it generally might be expected to have more limited application. However, tax policy conclusions drawn from a tax capitalisation model that factors in domestic shareholder tax rates may be relevant and important in certain contexts given that, even in countries with open economies, not all companies have equal access to international capital markets. For firms that rely on segmented domestic capital markets, domestic tax rates on shareholder returns may influence the cost of capital in ways predicted by the tax capitalisation model.

Perhaps the most widely used framework to assess possible effects of personal tax on the cost of capital is the tax capitalisation valuation model associated with King (1974, 1977), Auerbach (1979), Fullerton and King (1984), Edwards and Keen (1984), and Sinn (1987, 1991). Annex C reviews arbitrage conditions underpinning cost of capital expressions for the three main sources of corporate finance (debt, retained earnings, and new share issue) and discusses implications of various settings of personal capital gains, dividends, interest, and corporate income tax rates.[16] The cost of capital measures derived in Annex C for the case where the marginal supplier of funds is a domestic taxable shareholder, give the 'hurdle' pre-tax real rate of return on installed capital that must be earned at the margin to cover the firm's financing costs and taxes, and no more (where economic rent is exhausted).

By comparing cost of capital expressions under alternative sources of finance, possible effects of shareholder taxes (*e.g.* capital gains taxes and dividend taxes) on corporate financial policy may be revealed. In particular, where shareholder taxes cause the cost of capital to differ across sources of finance, the financial policy choice of firms may be distorted by the tax system towards sources obtained at the lowest cost. The results allow one to consider relative settings of shareholder tax rates and corporate tax rates that could leave the tax system having a neutral effect on the financial policy of firms (*i.e.* uniform cost of capital across sources of funds, as observed in the no-tax case).

Table 3.1 shows King-Fullerton-type cost of capital expressions (derived in Annex D) for debt, new equity and retained earnings, ignoring depreciation so as to focus on personal tax effects impacting the cost of funds (introducing depreciation would not

affect the relative ranking of the cost of capital across sources of finance). In Table 3.1, r denotes a fixed market rate of interest on bonds, u denotes the (statutory) corporate income tax rate, t_i denotes the personal income tax rate on interest, t_c denotes the effective personal tax rate on capital gains (effective accrual-equivalent rate) and t_{dp} denotes the personal tax rate on distributed profit, net of any integration relief provided at the personal level.

The cost of capital formulae in Table 3.1 may be interpreted intuitively. Consider first the case of debt finance. With a corporate tax deduction for the cost of debt finance where interest is deductible at the same corporate tax rate u applied to gross revenue on output from investment, tax effects on the marginal benefit and marginal cost of investment cancel out. Thus the cost of capital (or hurdle rate of return, measuring the pre-corporate tax rate of return where the firm just breaks even, covering its financing costs and no more) exactly equals the market interest rate r. (Under the simplifying assumption that physical capital does not depreciate, the marginal cost associated with the use of physical capital is simply the financing cost.)

Table 2.3:
Summary of cost of capital measures*

source of finance	pre-corporate tax hurdle rate of return (cost of capital)
debt (B)	r
new equity (NE)	$r(1-t_i)/(1-t_{dp})(1-u)$
retained earnings (RE)	$r(1-t_i)/(1-t_c)(1-u)$

*The formula considers the uniform (as opposed to split rate) case where the corporate income tax rate u is the same for retained and distributed profit.

In most tax systems, the cost of equity, unlike interest, is not deductible at the corporate level. Thus the cost of equity finance and the hurdle rate of return on investment financed at the margin by taxable domestic shareholders is predicted to be higher than the market interest rate in cases where the combined corporate and personal tax burden on equity returns exceeds the personal tax burden at rate t_i on interest earned on the investor's alternative investment in bonds. In systems that fully integrate corporate and personal tax, offsetting corporate tax on profit distributions to taxable domestic shareholders (for example, full imputation systems), so that the overall tax rate on dividend income equals the personal tax rate on interest, then the hurdle rate of return on investment financed by new share issue equals the market interest rate. If less than full integration applies, a distortion results with the hurdle rate of return exceeding the interest rate. The wedge between the hurdle rate and interest rate is the greatest where classical tax treatment applies (no integration relief provided).

Likewise, in the case of retained profit giving rise to taxable capital gains at the shareholder level, the hurdle rate of return can exceed the market interest rate, implying non-neutrality, if there is no tax relief against double taxation, with retained profit subject to both corporate income tax and personal tax on resulting capital gains. One possible mechanism to alleviate double taxation is to allow individuals to step-up the basis of their share by an amount reflecting their pro rata allocation (across shareholders) of corporate tax paid on retained profit. A simpler approach could be to allow partial inclusion of capital gains. Additionally, the ability to defer taxation of capital gains under a

realizations-based system, by deferring the sale of shares, implies an offset to the overall tax burden on retained earning. Where deferral is taken into account, the cost of retained earnings would be lower than that implied by the statutory capital gains tax rate.

The cost of capital results shown in Table 3.1 depend on several assumptions. One is that domestic taxable shareholders are the marginal providers of equity finance. For firms raising equity at the margin from international capital markets or tax-exempt investors, domestic personal tax rates would not apply and thus would not be expected to factor in. Furthermore, where providers of equity finance at the margin are taxable domestic taxpayers, the relevant personal shareholder tax rate is not obvious. An empirical issue is whether in each case the relevant tax rate is that of a top tax rate investor (*i.e.* a taxpayer subject to the top marginal tax rate of a tiered personal tax rate schedule.). Derived hurdle rates and implied distortions may therefore tend to overstate the influence of personal taxation on financial policy margins where the top shareholder tax rate overstates the rate paid by marginal shareholders. A further consideration is that, with the effective capital gains tax rate dependent on the holding period of shares under a realization-based system, choice of a 'representative' effective capital gains tax rate requires selection of a typical or average holding period, which may be somewhat arbitrary.

Two additional assumptions in the model are that shareholders cannot avoid dividend taxes on distributed returns, and do not anticipate changes in dividend tax rates. Where dividend tax cannot be avoided, the cost of retained earnings is found to be independent of the dividend tax rate (the dividend tax rate cancels out, with dividend tax incurred both under the option where after-corporate tax earnings are immediately paid out and invested in bonds, and also incurred if instead earnings are reinvested with dividend tax levied on future payout of earnings).[17] The cost of new share issues is grossed-up by the dividend tax rate measured net of imputation relief under the assumption that dividend tax is levied on future earnings on new capital committed to the firm, but avoided when investing savings external to the firm in bonds rather than equity.

Where dividend taxes can be avoided, or changes are anticipated in dividend (or capital gains) tax rates, the cost of capital and neutrality results would be different from those reviewed above. However, where dividend taxation cannot be avoided, tax changes are not anticipated, and domestic investors are marginal providers of funds, the model may provide a useful guide for policy making.

b) Country assessments of CGT effects on the cost of capital and corporate financial policy

The questionnaire asks countries whether possible impacts of capital gains taxation on the cost of capital and corporate financial policy are taken account of when setting tax policy, and if so, how such influences are factored in. Countries were also invited to discuss possible effects of capital gains taxation on corporate distribution policies.

The U.S. reports as a policy concern that taxing gains on corporate shares, contributing to double taxation of corporate profits, discourages corporate equity financed investment including financing by new share issue. Furthermore, taxing capital gains at lower rates than dividends and the ability to use basis sooner encourages firms to distribute profits to shareholders by repurchasing shares rather than by paying dividends. As an example of how these concerns have carried over to policy making, the U.S. notes that the recent cut in the tax rate on dividends and capital gains was motivated in large

part by the distortions caused by the double-tax on corporate profits. The same low tax rate now applies to both dividends and capital gains, which helps to reduce the incentive to distribute earnings by repurchasing shares, rather than by paying dividends, compared to prior law which taxed gains at a lower rate than dividends. It also reduces the tax advantage of debt finance over equity finance.

The questionnaire response from Sweden explains that during the four-year term of the non-socialist government in Sweden, immediately following the major tax reform of 1990-1991, a main tax policy objective was to mitigate the economic double taxation of corporate income in order to create neutrality at the personal level (*e.g.*, between interest and dividend income). For that reason, the dividend tax rate was set equal to zero (*i.e.*, income generated within a firm was taxed only once, at the firm level). The government's opinion was, however, that capital gain should be taxed at a positive rate.

Hence, during 1994, Sweden had positive tax rates at the personal level on interest income and capital gains (but at different levels) and a zero tax rate on dividends (implying double taxation of retained corporate income). The potential risk of corporate "lock-out" effects – that is, tax-induced incentives to distribute profits as dividends, implying a large amount of new share issues as a source of finance – were considered to be of minor importance in relation to efficiency losses accompanying the double taxation of distributed income.

The theoretical framework used to assess and explain this policy (based on the King-Fullerton model where different assumptions regarding the marginal source of funds lead to different policy conclusions) hinged on the assumption that the required rate of return for small- and medium-sized corporations in Sweden was unaffected by the international required rate of return. That is, small- and medium-sized corporations were operating under closed-economy conditions implying, among other things, that domestic personal tax rates will affect the corporate cost of capital.

In the middle of the 1990's, the theoretical framework underlying tax policy decisions in Sweden (again based on the King-Fullerton model) resorted back to the assumption of a small open economy under which even small- and medium-sized firms are influenced by the international required rate of return, implying that domestic personal tax rates do not affect the cost of capital. Instead, different tax rates on different types of savings were thought to only affect households' asset portfolio decisions, and therefore the ownership structure of assets. Based on this understanding, the socialist government reintroduced the rules from the major tax reform of 1990/91, with the introduction in 1995 of a separate and flat tax rate on all capital income (dividends capital gains and interest), which currently remain in effect.

Policy makers in the U.K. anticipate that the effect of capital gains tax on corporate financial policy is likely to be very limited. As a small open economy providing tax exemptions for dividends and capital gains accruing to pension funds and non-residents, the marginal investor is likely to be tax-exempt (implying that the cost of funds is determined independently of the domestic capital gains tax. Most infra-marginal investment is also tax exempt when taking into account the annual exempt allowance for capital gains tax, the effective zero% tax rate for lower and basic tax rate taxpayers on dividends (see section 3.2), and tax exempt ISA savings (see section 1.4).

Potential non-neutralities in the tax system are analyzed within a framework that measures effective tax rates on different forms of capital income (*e.g.* capital gains vs. dividends) for different asset types (*e.g.* property vs. businesses), different taxpayer types

(*e.g.* higher rate, basic rate, above or below CGT Annual Exempt Allowance), and different corporate forms (*e.g.* sole traders, limited companies). The framework is used to evaluate whether non-neutralities will be worsened by proposed policy changes, while recognizing that such effects may have limited application (due to the openness of the capital market and the importance of institutional investors).

The U.K. explains that one of the policy objectives for taper relief provided in its capital gains tax system is to encourage the provision of equity finance to small- and medium-sized businesses, given the difficulties they face in raising capital. By providing incentives to invest in new firms over longer periods, it is hoped that individuals with funds to invest would also take a longer-term interest in their investments, helping to provide not just funding, but advice, access to professional services, and so on.

Finland and Norway also report that possible tax distortions to corporate financial policy have been analyzed using King-Fullerton type tax-capitalisation valuation models. The tax reform process in Finland during the early 1990s – which involved moving to a dual income tax system, cutting corporate and capital income tax rates, and providing imputation relief, aimed at greater tax neutrality in financing decisions – relied on the King-Fullerton framework to identify pre-reform distortions.

Similarly, possible distortions to financial policy were one of the main policy issues in the design of the tax reform in Norway in 1992, which focused on the importance of having neutral taxation of corporate and personal capital income (another objective being to eliminate 'lock-in' effects noted in section 1.2). This resulted, among other things, in the introduction of a system with no double taxation of either dividends (full imputation) or capital gains (RISK-system). The policy goal of achieving neutrality with regards to corporate financial policy was maintained in the design of the new 'shareholder model' for taxation of shareholder income (capital gains and dividends).[18]

Effective tax rates are also calculated in Australia to assess tax implications to the (marginal) share investor resulting from different approaches at the corporate level to financing investment via debt, new equity or retained earnings. Possible distortions to corporate financial policy have influenced capital gains tax policy decisions in Australia, including the decision to apply a preferential effective tax rate on capital gains on assets owned for at least 12 months. One reason for this preferential treatment is to promote economic efficiency in corporate financial policy-making decisions by lowering the cost of capital and providing incentives for investment.

New Zealand also reports that it uses the King-Fullerton methodology to analyse possible tax distortions to corporate financial policy, with findings taken into account when addressing the pros and cons of alternative tax strategies, including the decision of whether or not to tax capital gains. New Zealand's assessment is that capital gains tax itself would be expected to impart a bias away from retained earnings. But this distortion to corporate financial policy could offset other tax biases towards equity financing, implying possibly greater neutrality with capital gains taxation. However, non-uniform corporate and personal tax rates also distort corporate financial policy in multiple and complex ways, and it is very difficult to assess the net effects overall of taxation, including capital gains taxation on financial policy. Hence, possible impacts of capital gains taxation on the cost of capital are not considered a decisive factor in the government's decision of whether or not to tax capital gains.

However, various practical consequences are pointed out by New Zealand that result from the decision to not tax capital gains. For instance, because of the distinction made

between income on capital and revenue account, an incentive is created and exploited to re-characterize revenue account income as on capital account. A good example of this is share repurchases. Rather than distributing earnings to shareholders by paying out a dividend (subject to a positive level of personal tax, assuming insufficient imputation tax credits), a company may buy back shares to the equivalent value of that dividend. The shareholders' ownership proportion is maintained, while receiving the distribution on capital account, and hence tax-free in the absence of a capital gains tax. As a result an incentive is created for a company to finance through equity rather than debt, as it can obtain a favoured tax treatment. For tax base maintenance protection, legislation has been enacted in order to tax such activities. However the existence of the capital/revenue boundary is always creating incentives to carry out these types of activities.

In the Czech Republic, possible capital gains tax effects on financial policy have not been raised by taxpayers and have not been explicitly addressed by policy-makers. The lack of interest of corporate taxpayers in this issue suggests that the cost of capital is independent of the capital gains tax rate, which is not surprising given that a tax exemption is provided for gains on securities held for 6 months or more. In the Netherlands, no link was drawn between corporate financial policy decisions and the taxation of capital gains of resident individuals, and thus potential tax distortions were not taken into account when the new system of taxing capital income was devised (consistent with the cost of capital being set in international capital markets). However, the taxation of capital gains is viewed by policy makers as neutral over corporate financial decisions, with no distortion in favour of debt finance.

Lastly, Spain reports that when the Spanish capital gains taxation system was modified in 1996, possible tax distortions to corporate financial policy were not explicitly addressed. However, consideration of certain corporate financial operations as generating either capital revenue or capital gains determined several fiscal policy decisions and legal modifications of the personal income tax regulations. Portugal reports that potential impacts of capital gains taxation on corporate financial policy were considered when taxation of capital gains was introduced in the income tax reform of 1989.

Box 2.1.
New Zealand's Assessment of the effects of Capital Gains Taxation on Corporate Financial Decisions

New Zealand's assessment of the effects of capital gains taxation on corporate finance decisions begins by considering what a company's financing incentives are without a capital gains tax. Without a capital gains tax, and given New Zealand's full imputation system, a company has no incentive to finance through debt as opposed to new equity (assuming arbitrage that equalizes rates of return net of personal tax in the closed economy case). If investors invest through new equity, they will only do so if the return generated is at minimum equal to the interest rate. Assuming the investment makes this return to the company, and all profits are distributed, share price will stay the same. Meanwhile, if debt financing is used, the minimum return will be cancelled out (offset) by interest paid, and the company will be no better off. Consequently, share price will not alter either.

There would be no biases between using new equity or retained earnings either in the absence of capital gains tax (as long as the company and personal tax rates are identical, and imputation credits are available). With a full imputation system, tax paid at the company level is able to be used to offset tax at the personal level. Therefore, whether earnings are distributed (and new equity is used), or retained within the company, they will give the same after tax return to the shareholder. As a company is indifferent between debt and new equity, and new equity and retained earnings, it follows that a company will also be indifferent between retained earnings and debt.

If (marginal) shareholders have a higher marginal tax rate than the company rate, they will be better off if the company uses retained earnings (subject to corporate tax alone), rather than distributing those earnings and seeking new equity. This is because company distributions would effectively be taxed at the higher marginal personal tax rate, so shareholders would have less to reinvest than the company would have to invest if it did not distribute. Conversely, if shareholders were taxed at a lower marginal rate than the company rate they would be better off with distribution (assuming full imputation). The company will only be influenced towards distribution (and, so, towards new equity financing) if the majority of shareholders are on a higher marginal tax rate than the company rate (or towards retention if on a lower rate).

If a company is unable to attach imputation credits to a dividend payment, a company will be biased towards retaining earnings (here incentives are similar to those in a classical tax system). If a company earns income from an investment in a foreign jurisdiction, and pays tax in that jurisdiction, it may not be liable to pay tax on that income in New Zealand. As a result, shareholders would not receive imputation credits on distributions of such income. In this situation a company could use the entire post foreign tax income to finance investment, whereas a shareholder would be taxed further on distribution, so they would have a smaller amount available to reinvest.

New Zealand's assessment considers next a company's incentives when imposing a capital gains tax. Assuming a positive balance in the imputation credit account, shareholders are assessed to be worse off if the company retains earnings. This is because retained earnings are incorporated into the price of shares. If a company chooses to retain earnings rather than distribute, the share price will rise accordingly. As such, assuming a number of shareholders will sell their shares in every period, shareholders selling their shares will be liable to pay tax on the capital gain resulting from the increase in share value. A company will be better off by debt financing or obtaining new equity.

Assume finally an insufficient balance in the imputation credit account. As noted above, without a capital gains tax and with an insufficient balance in the imputation credit account, there is a bias in favour of retained earnings. This bias would now be offset by a capital gains tax.

New Zealand concludes from the preceding assessment that a capital gains tax does result in a bias away from retained earnings, and so does distort corporate financial policy.[19] However, in some cases it may offset an already existing bias favoring of retained earnings. In addition, differing rates of corporate and personal tax will also distort corporate financial policy, and a capital gains tax may exacerbate or alleviate these distortions. As such, the overall effect of capital gains taxation on corporate financial policy is difficult to judge (uncertain), and therefore was not considered a decisive factor in the decision in New Zealand of whether or not to tax capital gains.

Notes

1 Household taxation of savings may alter the total volume of private savings. Taxation may also influence an investor's portfolio allocation between safe and risky assets, as well as the degree of portfolio allocation across multiple risky assets.

2 The investor's indifference curves, plotting points of investor indifference between terminal wealth in states I and II, are fixed (tax affects terminal wealth, but not investor preferences over terminal wealth across the two states). As the budget line contracts but does not shift following the introduction of the tax, and the slope is unchanged, the equilibrium point remains unchanged.

3 In the literature, the fraction (a) of initial wealth invested in the risky asset is referred to as 'social risk-taking', as investors and government are viewed as partners sharing in gains and losses through the tax system. In this report, we simply use the term 'risk-taking'.

4 For details, see the discussion of equation (C.32) in Annex C. A wealth elasticity of $\eta=10$ implies that the level (as opposed to percentage) demand for risky assets increases by 10 per cent if initial wealth is higher by 1 per cent.

5 This assumes an effective capital gains tax rate t of 1% (reflecting deferral of tax imposed at realization) and a safe rate of return of 10% (with the large return reflecting an extended holding period). Under these assumptions, the model indicates a critical wealth elasticity value of $\eta^{*}\approx 1.1$

6 For example, an individual may finance the opening of a recreational (*e.g.* tennis) facility to earn a profit, or for primarily consumption purposes (to benefit himself/close friends). The government may wish to support through symmetric capital loss treatment the activity if undertaken for a profit, but not otherwise. By requiring that capital losses on this investment be set off only against capital gains on similar investments, such targeting is more likely. Allowing capital losses on the investment to be set off against capital gains on unrelated property provides greater scope for subsidizing a consumption element, while more generous treatment provides even less restricted subsidization of consumption.

7 In the many asset case, it is not clear *a priori* that one can use the fraction of total wealth invested in (all) risky assets as a meaningful measure of the degree of risk-taking (account must be taken of the covariance of returns on risky assets). Sandmo (1977) shows that the general results of the two-asset model hold without any required assumption about the joint probability distribution of the rates of return.

8 See Hendershott, Toder and Won (1991, 1992), Haliassos and Lyon (1993) and Gordon (1985). Also note that while imparting certain random effects on the economy, capital gains taxation with full loss offset may play an automatic stabilizing role, with positive (negative) effects of gains (losses) on the economy dampened through taxation of gains (provision of loss offsets).

9 If, for example, venture capital financing requires government support (*e.g.* to achieve a critical mass of venture capitalists), but is done primarily by pension funds, foreign investors or other investors exempt from domestic capital gains tax, then it would be unlikely that liberalizing domestic capital loss offset rules (or reducing the capital gains tax rate) would materially impact on the level of risky investment undertaken in areas where impediments are identified.

[10] As pointed out by Norway, its Risk tax system reduces the incentive to immediately realize capital losses while deferring realization of capital gains.

[11] Taxation of capital gains was also reduced by reductions in statutory personal income tax rates (these reductions also apply to other personal taxable income, including interest income).

[12] Minimum withdrawal requirements apply after age 69. Eligible investments for registered retirement plans include certain assets producing capital gains.

[13] Empirical work by Schulman *et al.* (1996) finds evidence, both in the case of Canada and New Zealand, that financial policies of firms are indeed influenced by personal taxation of dividends and capital gains. They find that imputation credits provided by New Zealand in respect of corporate tax on distributed profit, and dividend tax credits provided in Canada, have reduced corporate debt-to-equity ratios. Reductions in the debt-to-equity ratio linked to integration relief were found to be not as pronounced in Canada, which introduced its capital gains tax on shares concurrent with the adoption of the dividend tax credit, with the first effect tending to increase the cost of equity (in particular, retained earnings) and the second tending to decrease the cost of equity (new share issues).

[14] A high debt/asset ratio in the corporate sector of a given country may be linked in part to a relatively high statutory corporate income tax rate (compared with other countries) which, by increasing the value of interest deductions, tends to make that country an attractive location from which to borrow capital for use in global operations. High tax rates on equity finance may tend to aggravate this situation.

[15] Where the statutory tax rate applied to realized taxable capital gains equals the dividend tax rate, the effective capital gains tax rate may be well below the dividend tax rate on account of tax deferral possibilities under a realization based system (*i.e.* the ability to defer capital gains tax by postponing asset disposition).

[16] For simplicity, the analysis assumes that physical capital does not depreciate, implying that the real (physical) return on a unit of installed capital is constant over time; and ignores corporate tax incentives (*e.g.* investment tax credits). This treatment does not alter the conclusions drawn from the neoclassical investment model, inclusive of shareholder tax rates, in relation to possible tax distortions to corporate financial policy linked to shareholder tax rates.

[17] Dividend taxes may be avoided where share repurchases are allowed and any resulting gains are taxed as capital gains, and not as distributions.

[18] For more on the 'shareholder model', see sub-section 1.2.d.ii) and is discussed in Sorensen (2003).

[19] As noted in the main text, the Norwegian RISK system is an example of a capital gains tax which does not result in a bias away from retained earnings.

Chapter 3.

Capital Gains Tax Design Issues

This chapter addresses issues in the design of capital gains tax rules influencing their application and ultimate impact on tax revenues and the sharing of the tax burden across taxpayer groups, on portfolio diversification and risk-taking in the economy, and on the cost of capital for investment and the financial and distribution policies of firms. Design dimensions addressed in the study include: realization- versus accrual-based taxation; applicable tax rates under personal income tax or a separate capital gains tax; treatment (e.g. ring-fencing) of losses; rollover provisions; treatment of gains on a taxpayer's principal residence; treatment of the inflation component of capital gains; treatment of gains on domestic assets owned by non-residents; and lastly, transitional considerations.

The country responses identify numerous considerations in the design of capital gains taxation rules shaping their coverage, application and ultimate impact on households. The design dimensions include: realization-based versus accrual taxation; applicable tax rates under a separate capital gains tax or personal income tax; treatment (*e.g.* ring-fencing) of losses; rollover provisions; treatment of gains on a taxpayer's principal residence; treatment of the inflation component of capital gains; treatment of gains on domestic assets owned by non-residents; and lastly, transitional considerations. The points raised by responding countries under these headings are sketched out below.

3.1. Realization vs. accrual taxation

All of the responding countries tax at least certain capital gains of households, and in doing so, most apply tax on a realization rather than accrual basis. The exception is New Zealand which applies accrual taxation to corporate bonds[1].

The common approach of adopting a realization-based system recognises that accrual taxation poses significant difficulties for taxpayers and tax authorities by requiring periodic valuation of assets (implying high tax compliance and administration costs where there is no obvious market to establish fair market value, as could be the case for certain intangible property or claims on such property). Realization-based taxation also creates liquidity problems for taxpayers that do not have sufficient cash to cover tax on accrued but unrealized gains, requiring them to borrow or sell assets to pay their tax liability.

3.2. Applicable tax rate (PIT vs. separate CGT)

Countries report that the setting of the statutory tax rate on taxable capital gains/losses, under a country's personal income tax or separate capital gains tax, can have an important bearing on tax planning incentives. A capital gains tax rate set above or below the tax rate on interest and dividends may also distort portfolio choice, raising efficiency concerns.

Protection of tax revenues was identified as a key policy objective by all responding countries that comprehensively tax capital gains. This view recognizes that exempting gains creates incentives on the part of corporate owners/workers to artificially convert investment income and ordinary income into tax-free capital gains, in the case of corporate owner-managers working in their own company. Policy-makers also recognize that incentives to transform ordinary and investment income into capital gains arise not only where capital gains are exempt, but also where the effective tax rate on capital gains is significantly less than that on other forms of income.

Thus, from a base protection perspective, there may be interest in aligning the statutory tax rate on taxable capital gains with the tax rate on investment income. Countries that provide shareholders with full or partial imputation credits on distributed profit (dividends) may decide to symmetrically integrate corporate and personal taxation of retained earnings (*e.g.* by stepping up share-basis). Or instead they may decide against aligning tax rates on gains, dividends and interest, given the scope for tax relief on gains from deferral under a realizations-based system. A further observation is that comprehensive (non-dual) income tax systems that tax realized capital gains, gross dividends and wage income (pooled income) at the same rate may provide less scope for tax-planning, compared with dual-income tax systems where rate differentials between

wage income, and income from capital (investment income and capital gains) are an inherent part of the tax structure.

Sweden explains that the personal tax rate on capital gains under its dual income tax system is aligned with that on investment income (interest and dividends) to level the playing field and avoid tax-distortions to asset choice.[2] Symmetric treatment of capital gains and dividends is also observed in the RISK system in Norway, and under the 'shareholder model' to be introduced in 2006. The attractions of aligning tax rates have also been important to the approach taken by Iceland, which currently imposes a 10% tax rate on capital gains of individuals, and on capital income including interest and dividends (which previously had been taxed at different rates) to counter tax avoidance and improve efficiency.[3]

If tax rates on dividends, interest and capital gains are aligned, but they are not aligned with tax rates on labour income, then tax avoidance incentives are likely to continue to confront policy-makers. Such is the case for all three of the above-noted countries with dual income tax systems, Sweden, Iceland and Norway.

As Sweden points out, it is not possible to eliminate tax-motivated conversions of labour income into capital gains, due to the dual income tax system applied in Sweden that taxes labour income at progressive tax rates and capital income at a flat rate. Under this structure, there remain tax-motivated incentives to re-characterize or convert high-taxed labour income into low-taxed capital income. This income-shifting problem is most accentuated for small corporations where one or a few owners also work in the firm. For that reason a special rule applies in taxing closely-held corporations. One implication of the rules is that, after 5 years of non-active ownership, the effective capital gains tax rate becomes considerably lower than the top marginal tax rate on labour income. While data show clearly that this opportunity is well known and used frequently, no special rules are being considered currently to curb this tax-planning activity.

Similarly, Iceland explains that the separate treatment of capital income and ordinary income has in many cases proved difficult. Ordinary personal income in Iceland is taxed at a rate of 38.55%, whereas capital income draws a 10% rate at the personal level. The corporate income tax rate is 18%. This tax rate structure provides certain individuals (*e.g.*, doctors, craftsmen) with an incentive and opportunity to convert their activities into corporate form, and withdraw income as profit at a combined tax rate of only 26.2%, compared to 38.55%, producing a tax rate differential (saving) in excess of 12 percentage points.[4] Before withdrawing income as profit, however, such incorporated persons must by law declare a certain minimum personal income, which is graded by profession. This personal income is taxed as ordinary income.

A motivating factor for introducing the 'shareholder model' in Norway in 2006 is a desire to address the tax incentive under the pre-2006 RISK system for owners/workers to incorporate and realize earned income as capital income in the form of capital gains or dividends taxed at the low 28% rate. Under the 'shareholder model', above-normal returns realized as capital gains or dividends would be taxed at an effective combined corporate and personal tax rate of 48.16%, significantly higher than the 28% rate applicable under the RISK system.[5] At the same time, top marginal tax rates on earned income are to be reduced. As both adjustments will significantly reduce the rate differential on the margin, incentives to convert earned income to capital income will be correspondingly reduced.

Under the current U.K. system, capital gains are taxed at income tax rates, but with generous reliefs and exemptions, including taper relief and an annual allowance.[6] The introduction of new reliefs to encourage saving and promote enterprise has contributed to a reduction in CGT yield as a proportion of GDP.

In Denmark, the combined tax rates on share income and company income are approximately aligned with marginal tax rates on labour income. This alignment is sought to avoid double taxation for working owners, and to also avoid transformation of labour income to share income in order to escape tax. Other capital income (interest and yields *etc.*) is taxed at the same marginal tax rates as labour income. This preferential treatment of share income implies some distortion to portfolio choice.

3.3. Ring-fenced treatment of losses

Taxpayer discretion over the timing of dispositions and thus the timing of gain/loss recognition, uncertainty in some cases over realization events, and reliance on rollover provisions where available, together may create considerable opportunity for investors to defer tax on capital gains, while obtaining up-front relief for realized capital losses. Moreover, taxpayers may aim to characterize consumption activities (*e.g.* the running of a hobby farm) as business activities, so that related expenses may translate into capital losses. The incentive to tax plan in this way could be expected to be stronger the more scope provided for capital loss offsets. Consequently, so-called 'ring-fencing' rules requiring that capital losses be deductible *only* against capital gains (and possibly other types of investment income) may be seen by policy makers as critical to protect the tax base. A potential downside of such measures, as reviewed in section 2.1, is that they may discourage risk-taking in certain cases.

With the exception of Norway, all of the responding countries that comprehensively tax capital gains have provisions that ring-fence certain capital losses so that they cannot be deducted against ordinary income. As a general rule, Norway allows capital losses to be set off against capital gains as well as all taxable income from employment, business and capital (additional detail provided below). In Australia, taxpayers include in their assessable income net capital gains on all assets, equal to the sum of total capital gains for the year, minus total capital losses (including net capital losses carried over from previous years), minus any capital gains tax discount and small business concessions to which the taxpayer is entitled.[7] While current year capital losses may be offset against current year capital gains, or carried forward indefinitely to offset capital gains in future years, capital losses cannot be offset against other income of the taxpayer.

In the U.K., as in Australia, allowable capital losses may be set off against chargeable capital gains on any type of asset (*i.e.*, generally no categorisation or ring-fencing of capital gains and losses by type),[8] and as a general rule, may not be set off against investment income or earned income. As an exception in the U.K. but not in Australia, capital losses on certain shares in higher risk unlisted trading companies may be set off against *total income*, provided that certain conditions are met. Unused capital losses may be carried forward indefinitely in the U.K. and in Australia to be deducted against future capital gains. Only in three exceptional cases (where a loss arises in the year an individual dies; where a mineral lease ends; and where a loss is realized on a disposal of an asset representing the right to deferred unascertainable consideration) may a capital loss in the U.K. be carried back to an earlier tax year. Australia does not provide for carry-back of capital losses in any circumstances.

For U.K. taxpayers, income losses from a trade, profession or vocation that cannot be set off against income may be set against capital gains (of any type), subject to certain conditions. This measure was introduced in 1991 to allow relief where an individual with a failing business realizes a capital gain on the sale of business or private assets, with the sale made to meet business debts. In such circumstances, where income is insufficient to absorb income losses, set off of those losses – effectively against money (capital gains) used for business purposes – was considered appropriate. The rules were amended slightly in 2002 to cater for taper relief so that a claimant was not disadvantaged by being eligible for the relief.

Relatively flexible ring-fencing provisions are observed in Norway, where rules governing the netting of capital losses against capital gains were altered with the 1992 tax reform which introduced a dual income tax approach taxing capital income as ordinary income, together with employment and business income, at a flat rate of 28%. As a general rule, capital losses may be set off without limit against capital gains and other types of ordinary income (which comprises all taxable income from employment, business and capital). At the same time, capital gains and losses are treated symmetrically; that is, capital losses of a given type are only deductible if capital gains of the same type are taxable.

In Sweden, losses on listed shares (except shares in mutual funds solely holding Swedish debt claims) and on unlisted shares in Swedish limited companies or foreign legal entities are first set off against capital gains on such assets. If capital losses exceed capital gains, so that there remains a residual loss after set off, 70% of the residual loss can be deducted *against other income from capital* (other capital gains, interest and dividends). Residual capital losses on listed shares in mutual funds solely holding Swedish debt claims, and on listed Swedish debt claims (with the exception of premium bonds), may be fully deducted (100%) against other capital income. Half (50%) of capital losses on personal residences are deductible.

In addition to allowing capital losses to offset not only capital gains but also, to varying percentages, other types of capital income, the Swedish rules provide investors with a tax reduction from other types of income. In particular, taxpayers are allowed to reduce their tax liability by 30% of the deficit amount up to 100,000 Skr (10,810 €), and by 21% of any remaining deficit.[9]

Sweden explains that the possibility of netting capital losses on different types of securities against net capital gains on other securities (as well as against other capital income) has been increased during the last five years. For example, previously, capital losses on listed shares could only be set-off against gains on other listed shares. The motive for this policy change has been to improve the external supply of capital to small- and medium-sized companies.

In the United States, up to $3000 (USD) of excess capital losses that cannot be set-off against capital gains may be set off against *ordinary income*. Under Canada's "allowable business investment loss" rules, 50% of capital losses on shares and/or debt of a qualifying small business corporation are deductible against capital gains and taxable income from any source.

In Denmark, capital losses on quoted shares are ring-fenced so that they may be deducted only against capital gains on other quoted shares or dividends from quoted and unquoted shares. Losses can be carried forward indefinitely.[10] However, capital losses on unquoted shares may be deducted against all other income. This provision has been

introduced to support equity financing of small- and medium-sized unlisted companies, with limited access to capital markets, which may be seen by investors generally as higher-risk investments. (Note that losses on bonds are not deductible at all, in Denmark, either against gains on bonds or other income.)

Ring-fencing restrictions are also observed to a varying extent in OECD countries that do not comprehensively tax capital gains. In the Czech Republic, capital losses can be netted only against capital gains of the same category of gains. In the case of Germany, losses on private dispositions can be netted only against gains on private dispositions (regardless of the type of assets). Losses that cannot be offset against gains in the same tax assessment period may be set off against gains realised on private dispositions in the immediately preceding tax assessment period, or carried forward to future tax assessment periods for netting against subsequent gains on private dispositions. Taxpayers are also allowed to net losses from other types of income against gains on private dispositions.

In New Zealand, there are no loss ring-fencing rules on domestic corporate bonds. Losses are fully deductible against current income, and may be carried forward to be deducted against future income. Also, as capital gains on domestic bonds are taxed as part of the personal income, ordinary (business) losses are deductible against capital gains on domestic corporate bonds. Moreover, as ordinary losses may be carried forward, taxable capital gains may be offset by prior year ordinary losses.

Relatively complicated loss-claim rules in Luxembourg disallow net losses on disposals of non-speculative substantial shareholdings (those of at least 10% and held over 6 months) and non-speculative holdings of real property (over 2 years) from offsetting ordinary income (such net losses may however offset net speculative gains on real and financial assets). Also, taxable non-speculative gains may be offset by net losses on speculative holdings of financial assets and real property.[11]

3.4. Rollover provisions

A number of responding countries flagged, as a key design consideration, so-called 'rollover' provisions that enable taxpayers to defer payment of capital gains tax that might otherwise be triggered. Main rollover provisions reported by countries responding to the questionnaire are summarized in Table 3.1.

As noted, the principal reasons for taxing capital gains on a realization basis are to avoid valuation as well as cash-flow or liquidity problems associated with accrual taxation. Such concerns may continue to apply for certain dispositions where rollover relief is provided (*e.g.* where two intangible assets are exchanged and both are difficult to value, calling for an asset-for-asset rollover). In other cases where valuation and/or cash-flow problems may not apply, other considerations may be raised calling for rollover relief. Such factors may include consideration of the appropriate tax unit (for rollover transfers of same assets between spouses), competitiveness concerns, and efficiency arguments. Also, as noted in section 2e), it may be argued that efficiency may be improved by rollover relief where imposition of capital gains taxation would discourage incorporation or a corporate reorganization that would lead to a more efficient use of the underlying assets.

A useful way to broadly categorise rollovers, as pointed out by Australia, is to differentiate 'same asset rollovers' and 'replacement asset rollovers'. Same asset rollovers, as the name suggests, involve the transfer of a given asset amongst taxpayer

entities. The rollover has the effect of disregarding for current capital gains tax purposes the asset disposed of, and passing on the capital gains tax attribute of the asset being rolled over from one entity to another. As a result, the transferor is exempted from capital gains tax on the disposal, while the transferee assumes the capital gains tax burden on the eventual disposition.

In contrast, replacement asset rollovers apply when a taxpayer disposes of an asset and replaces it with, in most cases, a similar asset. As a consequence of the rollover, the taxpayer disposing of the original asset is exempted from capital gains tax on that asset, with the capital gain passed onto the replacement asset, typically through a mark-down in its acquisition cost recorded for capital gains tax purposes.

Same asset rollovers

Three types of same-asset rollovers applying to individuals are distinguished in the questionnaire. A common type involves transfers of assets within a family. In Australia, rollover relief is automatically available where a capital gains tax asset – that is, any asset that may give rise to taxable capital gains – is transferred to a spouse or former spouse because of a marriage breakdown. An asset transfer in the U.K. between a husband and wife who live together at some time in the tax year of the transfer is granted rollover relief, in recognition of the family unit. While in Denmark, rollover relief is provided for transfers of equity shares (but not bonds) to family members, provided that the share transfer constitutes at least 15% of the voting power of issued shares (*i.e.*, the transferor must be a 'principal stockholder').

Another form of 'same asset rollover' provided by the Netherlands defers capital gains tax where business assets are sold to an employee or to a member of the same partnership. In Denmark, where a stockholder transfers equity shares to an employee, rollover relief is granted if the share transfer constitutes at least 15% of the voting power of issued shares.

A third type of 'same asset rollover' involves transfers of assets from a sole trader or partnership business to a wholly owned company. In Australia, rollover relief is available where a capital gains tax asset or all the assets of a business are transferred from a sole trader or partnership business to a company in which the sole trader owns all the shares.

Replacement asset rollovers

Different forms of replacement asset rollover are reported including asset-for-shares transactions, asset-for-asset transactions, and share-for-share transactions. The first type involves investment of business assets in a corporation in exchange for an equity interest in the corporation. In the Netherlands, where business assets from a privately-owned business are invested in a corporation, in exchange for newly-issued shares of that corporation, the accrued gains on the business assets can, upon request, be passed onto the corporation. Similarly, in the U.K., gains on incorporation of a business may be rolled over, to the extent that consideration for the incorporation comprises shares in the receiving company. The U.K. explains that the policy rationale for rollover relief in this case is to eliminate a taxation obstacle to continued growth of successful businesses, while recognising the continued ownership of the business and effective non-realisation of gains on the business assets.

Another form of replacement asset rollover involves the investment of proceeds from the disposition of business assets in replacement business assets. The U.K. provides rollover relief for gains on disposals of certain assets used in a trade, profession or vocation (primarily business premises and business goodwill) where the proceeds are reinvested in replacement qualifying business assets. Full relief is available only if the whole of the proceeds are reinvested and the old asset has been wholly in business use throughout the period of ownership. The policy rationale is to avoid depletion of business capital through a tax charge on disposal of the old asset, which could inhibit modernisation and expansion.

In Luxembourg, where capital gains are earned on the disposition of an asset included in net invested assets, the operator may under certain conditions transfer the capital gain to a replacement asset acquired in the same year. If the replacement takes place in a subsequent year, rollover is still possible under certain conditions. Where a building or non-depreciable fixed asset (*e.g.* land) is disposed of, the resultant capital gain may be transferred to fixed assets purchased using the proceeds from the disposal. Similarly, rollover relief is provided in Denmark in respect of reinvestment in certain business assets (*i.e.*, buildings).

When a business asset is sold in the Netherlands and the proceeds are invested in a qualifying replacement business asset, rollover relief is granted provided that the proceeds are reinvested within 3 years. The mechanics of this deferral involve the transfer of the capital gain on the old business asset to a special reserve; when a new business asset is bought, this reserve lowers the book value of the new asset. This rollover relief is aimed at stimulating investment, and in particular, to prevent investment from being hampered by drains on cash-flow due to taxation.

A number of countries provide rollover treatment for company reorganisations (*i.e.*, mergers and acquisitions) involving share-for-share transactions. Sweden, like other EU countries, applies rollover rules in the case of share-for-share transactions in compliance with EEC directive 90/434/EEC of 23 July 1990 on the common system of taxation applicable to mergers, divisions, transfers of assets and exchanges of shares concerning companies of different Member States. Share-for-share trades do not trigger taxation in Sweden until the new shares (from the share purchasing company) are sold and the gains are realized. As another example, capital gains are not immediately recognised for tax purposes in the Netherlands where a shareholder receives new shares in exchange for old shares as part of a business reorganization.

In the U.K., gains on exchanges of shares or debentures in certain company reorganisations, company take-overs and other forms of company reconstruction may be rolled over, to the extent that shares in, or debentures of, the relevant company are received in the exchange. This treatment recognises the 'paper-for paper' nature of the transaction: that is, the continuity of the underlying investment and absence of true realisation of a capital gain/loss on the occasion of the reconstruction.

The preceding replacement asset rollovers involving company reorganizations and the reinvestment of proceeds from the disposition of capital gains assets into the same or a successor corporation, imply some continuity in the underlying investment. Another class of replacement asset rollovers does not require such continuity. As an example, in the U.K., gains which are reinvested in certain new shares in qualifying unlisted trading companies may be 'held over' (rather than 'rolled over') until the shares are disposed of (or certain other events occur). The policy rationale is to encourage investment in higher risk new or growing corporate businesses.[12]

In addition to providing rollover-relief for share-for-share transactions, Sweden provides rollover relief in respect of a taxpayer's primary residence. Where a taxpayer sells his/her personal residence in Sweden and buys and moves into a new one in Sweden, recognition of a capital gain on the sale is deferred. Spain also provides rollover relief in respect of gains realized on a taxpayer's primary residence where the proceeds are reinvested in a new primary residence. Partial relief is granted where only part of the proceeds are reinvested (under certain restrictions). It should also be noted that Spain provides rollover relief for capital gains on the sale of participation in qualifying collective investment institutions if the total proceeds are reinvested in similar participation. Again, partial reinvestments receive partial relief.

Lastly, as considered in B.2.d, it should be noted that a number of countries provide for rollover relief at the time of death of a taxpayer. To take an example, rollover is granted in Australia at the death of a taxpayer: an asset owned by a taxpayer is deemed not to be disposed of as the result of the taxpayer's death, a capital gain or loss from a capital gains tax asset of the taxpayer is ignored (rolled over) and the accrued capital gain is taxed when a beneficiary subsequently disposes of the inherited asset. Australian provisions also allow for rollover relief for other 'involuntary' disposals, such as theft or destruction of an asset or a compulsory acquisition by a government agency occurs.

3.5. Treatment of personal residence

Another important design consideration identified in the country responses is the treatment of a taxpayer's personal residence. While capital gains on homes would be taxed under a comprehensive income basis, a number of countries provide for a full exemption (provided the home is not a business asset, or used for business purposes). As noted above in the case of Sweden and Spain, and below in the case of Iceland, certain countries provide tax deferral relief instead through rollover treatment. Additionally, capital gains on the sale of a personal residence in Spain are exempt if the taxpayer is 65 years of age or older at the time of sale.

In Australia, personal residences are generally exempt from capital gains tax, apart from income-producing use during temporary absences of up to six years at any one time. A partial capital gains tax liability arises to the extent that the taxpayer uses the home for business or other income-producing purposes. In the Netherlands, a tax exemption is provided for capital gains on one's personal residence, but is lost if the property is used for business purposes. Similarly, capital gains tax would not apply in the case of New Zealand, nor in Germany where the residence is not used for business purposes.

Capital gains realized on the sale of a taxpayer's principal residence are exempt in Luxembourg. Such gains are also exempt in Norway if the seller has owned the residence for at least one year, and has resided there for at least one of the previous two years. Similarly, capital gains tax is waived in the Czech Republic on gains on the sale of a principal residence provided that the seller owned the residence and resided there for at least two years prior to the sale. In Denmark an exemption applies if the property is occupied by the owner at the time of the disposition. Individuals in Iceland are exempt from tax on gains on the sale of a principal residence provided that they have owned it for at least two years before selling it. Should they decide to sell within two years, they can carry the profit (capital gain) over two year-ends before it becomes taxable. If the homeowner invests the proceeds in a new and more expensive house over that two-year period following the sale, the profit is exempt.

Table 3.4. Rollover Provisions
(as of 1 July 2004)

Country	Same Asset Rollover		Replacement Asset Rollover			
	Asset transfer between spouses	Business asset sale to employee	Share for share exchanges	Share for business asset exchanges	Business asset for business asset transactions	Business/business asset for share exchanges
Australia	Yes, but only for transfers of assets to a spouse because of a marriage breakdown.	No	Yes, but only for exchange of shares in original company for shares in new company in a takeover or merger.	No	Yes, for: small business replacement asset rollovers; assets compulsorily acquired, lost or destroyed; strata title conversions; scrip for scrip exchanges; renewal/surrender of statutory licenses.	Yes Rollover relief is provided where assets of a sole trader (or partnership) business are transferred to a company wholly-owned by the sole trader (a form of 'same asset' rollover).
Austria	No	No	Exemption for CG on non-substantial, non-speculative shareholdings. Rollover relief for corporate reorganizations (including mergers, divisions, transfers)	No	Yes, rollover relief for movable assets held ≥7 years, immovable assets held ≥ 15 years, if assets replaced within 1 year by new similar assets.	Yes, rollover relief for transfers of a business to a corporation in return for shares.
Belgium	na (joint taxation)	No	Exemption for CG on non-substantial, non-speculative shareholdings. Rollover relief for corporate reorganizations (including mergers, divisions, transfers)	No	Yes, rollover relief for fixed assets held > 5 years if the proceeds are reinvested in depreciable non-financial fixed assets within 3 years (5 years for building, ships and aircraft)	No
Canada	Yes	No	Yes, for many forms of business reorganization. Deferral also under certain conditions where proceeds from sale of a small business corporation are invested in another eligible small business corporation.	No	Yes, for dispositions of capital property (other than shares) (*e.g.* land or building) held for business purposes, if proceeds are reinvested in replacement property within specified time frame.	Yes, rollover relief if the taxpayer receives shares, cash or other property, in exchange for business assets.

Table 3.4. Rollover Provisions
(as of 1 July 2004)

Country	Same Asset Rollover		Replacement Asset Rollover			
	Asset transfer between spouses	Business asset sale to employee	Share for share exchanges	Share for business asset exchanges	Business asset for business asset transactions	Business/business asset for share exchanges
Czech Republic	No	No	Yes. In a share-for-share exchange, the holding period test of 6 months does not start anew, rather it carries over.	No	No	No
Denmark	Yes (for share transfers ≥ 15% of voting power of the shares)	Yes (for share transfers ≥15% of voting power of the shares)	Yes	No	Yes, for dispositions of buildings, if proceeds are reinvested in new building.	No
Finland	No	No	Yes, in accordance with EEC directive (90/434/EEC) on common system of taxation for mergers, divisions, asset transfers, share exchanges.	No	No	No
France	Yes (for certain share transfers)	No	Yes	No	No	No
Germany	No	No	Exempt treatment of corporate reorganizations, including mergers, divisions and transfers.	Yes (€500,000 rollover for gains on shares in joint stock companies invested in shares, depreciable assets or buildings.)	Yes (for buildings and land, if reinvested in buildings or land within prescribed time periods)	No

Table 3.4. Rollover Provisions
(as of 1 July 2004)

Country	Same Asset Rollover		Replacement Asset Rollover			
	Asset transfer between spouses	Business asset sale to employee	Share for share exchanges	Share for business asset exchanges	Business asset for business asset transactions	Business/business asset for share exchanges
Greece	Yes (for certain share transfers)	No	No	No	No	Yes. A sole proprietorship may transform/change to a S.A. or to a Ltd. without tax-payment as long as the transformation is subject to the laws that provide motives/ incentives for enterprises transformations. The sole proprietor has to provide accounting results.
Hungary	No	No	No	No	No	No
Iceland	No	No	Yes, provided the shares are replaced with other shares of equal or greater value.	Yes, provided yjr shares are replaced with business asset of equal/greater value.	Yes, provided replacement asset is at least as expensive as disposed asset.	No
Ireland	Yes	No	Yes, for share for share exchanges in a business reorganization (no rollover relief for debentures).	No	No (this form of rollover relief was abolished, from 2003, as a base broadening measure, given reduced capital gains tax rate)	Yes, rollover relief is available on transfer of a business to company, in exchange for shares
Italy	Yes	No	Yes, for corporate acquisitions giving control, if shares of the acquiring company received by shareholder of acquired company are assigned the same value for tax purposes as shares of acquired company given in exchange.	No	Yes, for exchanges if asset received is assigned a value for tax purposes equal to the asset given. No rollover for business assets sold and replaced.	No

Table 3.4. Rollover Provisions
(as of 1 July 2004)

Country	Same Asset Rollover		Replacement Asset Rollover			
	Asset transfer between spouses	Business asset sale to employee	Share for share exchanges	Share for business asset exchanges	Business asset for business asset transactions	Business/business asset for share exchanges
Japan	No	No	Yes, for corporate acquisitions, if shares of acquiring company are recorded at the same book value as shares of acquired company given in exchange.	No	Yes, for exchange of land, buildings, machinery and equipment, ship, owned ≥ 1 year, in return form similar asset held by other person ≥ 1 year.	No
Korea	No	No	Yes, rollover relief is available on transfer to qualified venture company in exchange for shares, and on transfer to holding company in exchange for shares.	Yes	No	Yes, rollover relief is available on transfer of a business ≥ 5 years to a new company, in exchange for shares.
Luxembourg	No	No	Yes (applicable to gains on share exchanges involving substantial participation).	No	Yes, gain on disposal of a fixed asset (building, land) may be transferred to fixed asset acquired or constituted using proceeds of disposal.	Yes, gain on disposal of a net invested (business) asset may be transferred to a replacement asset acquired or constituted in same or subsequent year.
Mexico	No	No	Yes, for certain corporate reorganizations.	No	No	No
Netherlands	No	Yes, where business asset sold to employee or to member of same partnership.	Yes, under certain conditions, for gains on substantial shareholdings.	Yes (rollover relief on transfer of shares of a corporation to an unincorporated business).	Yes, rollover relief if proceeds from sale of a business asset are invested within 3 years in another business asset. Some conditions apply.	Yes, rollover relief on transfer of business assets to a corporation in exchange for newly issued shares.
New Zealand	No	No taxation	No taxation	No taxation	No taxation	No taxation

Table 3.4. Rollover Provisions
(as of 1 July 2004)

Country	Same Asset Rollover		Replacement Asset Rollover			
	Asset transfer between spouses	Business asset sale to employee	Share for share exchanges	Share for business asset exchanges	Business asset for business asset transactions	Business/business asset for share exchanges
Norway	Yes	No	No (Possible rollover relief by discretionary authority. Rollover relief is provided by the Ministry of Finance under certain conditions, to facilitate corporate reorganizations. Up to 20% of compensation for shares may be in the form of cash. Value for tax purposes of business assets transferred determines new book value and share compensation.	No (Possible rollover by discretionary authority)	No (Possible rollover by discretionary authority)	No (Possible rollover relief by discretionary authority, for transfers of a personally-owned business activity or partnership to a firm, provided former owner(s) hold ≥ 80% shares in receiving company; value for tax purposes of transferred assets is assumed by the receiving company; and value of shares received equals the value for tax purposes of the transferred assets.
Poland	No	No	Yes, for share for share exchanges part of a business reorganization.	No	No	No
Portugal	No	No	Yes, for share for share exchanges part of a business reorganization.	No	Yes, rollover relief for 50% of gains on tangible fixed business assets held ≥ 1 year, if proceeds invested within 4 years in similar assets (excluding second-hand assets acquired from related parties).	Yes, for transfers of personal immovable property to a business activity exercised by the owner in his own name or to a society in which the owner holds at least 50% of the capital.
Slovak Republic.	No	No	Yes, for share for share exchanges part of a business reorganization.	No	No	No
Spain	No	No	Yes, for gains on shares in collective investment institution if reinvested in similar participation.	No	No	No

Table 3.4. Rollover Provisions
(as of 1 July 2004)

Country	Same Asset Rollover		Replacement Asset Rollover			
	Asset transfer between spouses	Business asset sale to employee	Share for share exchanges	Share for business asset exchanges	Business asset for business asset transactions	Business/business asset for share exchanges
Sweden	No	No	Yes, in accordance with EEC directive (90/434/EEC) on common system of taxation for mergers, divisions, asset transfers, share exchanges.	No	No	No
Switzerland	NA (joint taxation)	No	No taxation	No taxation	Yes	Yes
Turkey	No	No	No	No	No	Yes, for transfers of a business as a whole.
United Kingdom	Yes	No	Yes, for gains on shares and debentures exchanged under certain reorganizations (incl. takeovers) to the extent that shares in, or debentures of, the relevant company are received in exchange. Special deferral rule to "hold-over" gains invested in new shares of qualifying unlisted trading companies.	No	Yes, for gains on certain business assets (primarily business premises and goodwill) if proceeds reinvested in replacement qualifying business assets	Yes, for gains on incorporation of a business to the extent that consideration comprises shares in the receiving company.

Table 3.4. Rollover Provisions
(as of 1 July 2004)

Country	Same Asset Rollover		Replacement Asset Rollover			
	Asset transfer between spouses	Business asset sale to employee	Share for share exchanges	Share for business asset exchanges	Business asset for business asset transactions	Business/business asset for share exchanges
United States	Yes, between spouses or to a former spouse incident to a divorce (if done within one year or be related to the cessation of the marriage). The transferor's basis carries over to the transferee, *i.e.*, any gain or loss is rolled over.	No	Yes, for gains on certain small business stock rolled over into purchases of other eligible small business stock. An exchange of stock for the shares of the same class of stock in the same corporation is not taxable. Provided that various conditions are met, stock exchanges as a result of corporate reorganizations or stock issued as a result of certain spin-offs or split-offs or split-ups are not taxable. Taxpayers can elect to sell qualified securities to an ESOP or worker owned cooperative and replace the securities with other securities without recognizing gain.	Yes, under certain conditions: Rollover is allowed if the transferors immediately transferring assets to the corporation in exchange for stock own at least 80% of the voting stock and 80% of other stock of the corporation. Gain is taxable to the extent that the transferor receives any other property, including securities. Rollover is allowed if a corporation acquires assets of a subsidiary which is subsequently liquidated.	Yes, for gains on business assets exchanged for like-kind assets. Cf. This rollover relief (section 1031 transaction) also applies to gains on real property (land) held for investment purposes, but not to gains on corporate shares/securities.	Yes, in certain situations. Rollover applies if a target corporation transfers its assets to an acquiring corporation in exchange for stock that is then distributed to its shareholders in a liquidating distribution.

Source: 1) Questionnaire responses provided by Australia, Canada, Czech Republic, Denmark, Finland, Germany, Iceland, Ireland, Italy, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Portugal, Slovak Republic, Spain, Sweden, United Kingdom, United States; 2) European Taxation Database and European Tax Handbook (2004), International Bureau of Fiscal Documentation.

Notes: NA = not applicable. Business assets considered in Table 3.1 (and Tables 1.1 and 2.1) are business assets not held as part of trading stock.

3.6. Treatment of the inflation component of (nominal) capital gains

A benchmark tax system that taxes comprehensive income would include real capital gains in the tax base – that is, nominal capital gains adjusted to net out the inflation component. In the U.K., the approach taken to address inflationary gains has been a key design consideration. For assets acquired prior to April 1998, an indexation allowance is provided for most assets, with reference to the U.K. retail prices index.[13] In 1998, the U.K. replaced indexation relief (while retaining it for corporate taxpayers) with taper relief which exempts an increasing proportion of the gain the longer the asset is held.

An inflation adjustment applied in Australia, until September 1999, for capital gains on assets owned for at least 12 months. Inflation indexation of gains was provided for all asset types (indexation did not apply to capital losses – capital losses were determined on the basis of a non-indexed cost base). Indexation of gains was replaced, with effect from 21 September 1999, by a discount method under which individuals include in taxable income only one-half the nominal capital gain on assets owned for at least 12 months. An inflation adjustment calculated to September 1999 may continue to be used (as an alternative to the discount method) for assets acquired before 21 September 1999. Companies remain eligible for indexation adjustments for assets acquired before 21 September 1999 but calculated only to September 1999. The discount method is not available to companies even though until September 1999 they had been eligible for indexation. Companies are now required to include the whole nominal capital gain in their taxable income for assets acquired from 21 September 1999.

In Denmark, an adjustment for inflation is provided only for capital gains on agricultural farm property. Spain provides inflation relief in respect of immovable property, and similarly in Luxembourg, disposals of building are adjusted for inflation. Indexation relief is not provided in Iceland, Norway or the Netherlands, nor does it apply in the Czech Republic, Germany or New Zealand.

3.7. Treatment of non-residents

Another important consideration is the treatment of non-residents, identified by the U.K. as a key design consideration. Individuals who are neither resident nor ordinarily resident in the U.K. in any tax year are not liable to capital gains tax for that year, except in relation to gains on domestic assets of a trade, profession or vocation carried on in the U.K. through a branch or agency.[14] Furthermore, where a resident individual taxpayer becomes non-resident, capital gains taxation is not automatically triggered.

Australia also taxes non-residents on capital gains on dispositions of assets used to carry on business through a permanent establishment in that country. Capital gains tax also applies to gains on the sale of land and buildings in Australia; shares in Australian-resident private companies and interests in resident trusts; non-portfolio (*i.e.* 10% or greater) shareholdings in Australian-resident public companies; and non-portfolio unit holdings in Australian-resident unit trusts.[15] Moreover, deemed realization rules apply (tax is triggered on accrued gains on worldwide assets, wherever located) when a resident becomes non-resident. Limited exceptions apply to short-term residents.[16]

In contrast, Denmark does not impose any tax on non-resident individuals on capital gains connected with business or portfolio interests in Denmark. In Sweden, non-resident individuals are subject to capital gains tax on real properties and owner occupied flats

situated in Sweden. Where a resident becomes non-resident, deemed realization rules apply to accrued gains on certain assets (*e.g.* bonds, mutual funds). In the case of Spain, non-resident individuals are subject to tax on capital gains on the sale of immovable property situated in Spain (or the sale of registered rights to such property), and on the sale of shares in a resident company.

Non-resident individuals are subject to Norwegian tax on capital gains realized on movable and immovable property situated in Norway, subject to the general (and comprehensive) tax exemptions prevailing to realization of such property; and movable property forming part of a business enterprise in Norway (business assets). A non-resident individual, who has been a Norwegian resident at any point of time during the five years immediately preceding the realization, is liable to Norwegian tax on capital gains realized on shares or other ownership interests in a Norwegian company, as well as rights, options or any other financial instrument related to such shares or interests, at the time of realization. Deemed realization rules do not apply where a resident becomes non-resident.

In the case of Luxembourg, non-resident individuals are not liable to tax on capital gains on assets held for less than 6 months (speculative profits), but are liable if they own a substantial interest (more than 10%) in a company. Similarly, in the Netherlands, non-resident individuals are subject to domestic capital gains tax where they have a substantial interest (5% or more) in a company established in the Netherlands. Whether or not tax is actually levied depends on the provisions of the applicable tax treaty.

In the Czech Republic and Iceland, statutory provisions subject non-resident individuals to (domestic) capital gains tax on certain domestic assets. However, double taxation relief may be available under an applicable tax treaty agreement. Iceland, for example, does not impose capital gains tax where a resident moves to a country with which it has a tax treaty (if a tax treaty does not apply, capital gains are treated as having been realised).

Germany taxes non-resident individuals on capital gains on dispositions of assets connected with a permanent establishment in Germany. Gains on the sale of domestic real property, domestic conglomerations of property and rights located in Germany or exploited in a permanent establishment in Germany are also taxed when they belong to a foreign business establishment. Moreover, non-residents are subject to capital gains taxation on the sale of domestic real property held no longer than ten years and on the sale of shares in an incorporated company with a seat or place of management in Germany, if the shares amount to at least 1% of the company over the prior five years.

In the case of New Zealand, which taxes only certain capital gains (on an accrual basis), non-resident individuals are subject to (accrual) taxation only if they have a permanent establishment in New Zealand, and the gains related to that permanent establishment. New Zealand points out that while this may occur frequently for companies, an individual is unlikely to be non-resident and have a permanent establishment in New Zealand. When a resident taxpayer becomes non-resident, both anticipated and unanticipated gains/losses on domestic corporate bonds are deemed to have been realized, and are taxed.

3.8. Transitional considerations

Transitional arrangements were flagged by Australia as an important design consideration when introducing a capital gains tax system. In Australia, capital gains tax

was introduced on an entirely prospective basis – that is, the tax applied only to gains on assets acquired after the commencement of the tax. While it was recognised by policy-makers that this would give up tax revenues and could contribute to lock-in effects, less generous forms of prospective taxation (*e.g.* that would tax prospective gains on assets held at the time of commencement) were rejected on the grounds that they would require valuations of assets already owned, and negatively influence public acceptance of the tax. Prospective taxation of gains on assets acquired after commencement of the tax would address these concerns, while also providing the public and the revenue authorities with time to adjust to application of the new tax.

Notes

1 More specifically, expected gains are taxed on an accrual basis, while unanticipated gains or losses are taxed (or deductible) on realisation. Any premium or discount on a debt instrument is spread on a yield-to-maturity basis over the term of the instrument, while any gain or loss resulting from a change in market interest rates is recognised when and if that gains or loss is realized.

2 One exception to this main neutrality principle (apart from the possibility to postpone through rollover relief tax payments on realized gains on personal residences) is that shares traded for shares do not cause any taxation until the new shares (from the share purchasing company) are sold and the gains are eventually realized (rollover relief for share-for-share transfers).

3 The 10 per cent tax rate on capital gains is fixed, independent of the holding period. One exception is provided to the general approach of taxing realized capital gains at 10 per cent: individuals are exempt from capital gains tax on gains from the sale of their principal residence, provided that they have owned it for at least two years before selling it.

4 The combined tax rate is calculated as (0.18)+(0.10)*(0.82)). On 100 units of pre-tax income, 18 is paid in corporate tax, leaving 82 distributed as capital income or retained and giving rise to a capital gain. Taxation of the 82 at 10 per cent yields an additional personal level tax of 8.2, for a combined tax of 26.2.

5 For more detail on the Norwegian shareholder model, see the discussion in section 1.2.d.ii) and Annex A.

6 An individual's total net taxable capital gain (*i.e.*, total taxable capital gains, less total allowable capital losses, and reduced by taper relief) is liable to capital gains tax at his/her top marginal rate of income tax on savings income. For the tax year 2004-05, the income levels and tax rates (above an individual's Personal Allowance) are: £0-£2020: 10%; £2020-£31400: 20%; over £31400: 40%. The provision of taper relief means that the effective tax rates are lower. (Note that taper relief is based on the length of time for which an asset in question has been held and whether it is a

business or non-business asset. For an individual liable in 2004-05 to tax on savings income at 40 per cent, and entitled to maximum taper relief available for that year, the effective tax rate is 30 per cent for gains on non-business assets, and 10 per cent for gains on business assets. By the tax year 2007-08, the first tax year when maximum taper relief for non-business assets becomes available, this effective tax rate reduces to 24 per cent.)

7 A deduction for losses on personal use items is not allowed, except for certain specified items, with the proviso that capital losses on specified personal use items are deductible only against capital gains on specified personal use items.

8 A restriction is imposed where a capital loss arises on a disposal to certain relatives (*e.g.*, a spouse or child) or another 'connected person'. Such losses may be set off only against gains arising on disposals to the same person.

9 The term 'deficit amount' is used here to refer to the aggregate amount by which residual capital losses (scaled by the allowable percentages) exceed capital income.

10 Losses on the disposition of one's personal residence are also ring-fenced. Capital losses in this case may only be netted against capital gains from sales of other real property. An unlimited loss carry-forward applies within the real property category).

11 Under Luxembourg's loss-offset rules, losses are offset in stages. Separate net capital gain/loss calculations are first required for three categories of dispositions: (1) speculative profit on financial or real assets, (2) gains/losses on the disposal of real assets; and (3) income from the disposal of a substantial shareholding held for more than six months. Net losses and net gains from categories (2) and (3) are then pooled.[11] A net loss from pooled categories (2) and (3) may be set off against net gains from category (1). A net loss from category (1) may be set off against a net gain from pooled categories (2) and (3). A residual net loss may not be pooled with other gains or profit. Note that non-substantial private shareholdings in excess of 6 months are exempt from tax.

12 The U.K. also explains that it provides a "same asset rollover" for gains on the disposal of business assets (including shares in unlisted trading companies) where the disposal is not a bargain at arm's length. (for instance, an outright gift). Where this relief applies, any accumulated gain which is "rolled over" is transferred from the disposer to the acquirer of the asset.

13 Since 1993 it has not been possible to use the indexation allowance to create or increase an allowable capital loss on any type of asset. This adjustment to the rules represented a reversion to the position when indexation was first introduced in 1982: the indexation allowance was brought in originally as a relief from liability to tax in respect of gains insofar as they were attributable to inflation.

14 Individuals who are temporarily non-resident may be liable in certain circumstances to capital gains tax in the tax year when they return to the U.K. on gains made whilst they were temporarily abroad.

15 Legislation was introduced on 22 June 2005 (yet to be implemented) that will reform the capital gains tax treatment of non-residents. The reforms will narrow the range of assets on which a non-resident is subject to Australian CGT to real property, and the business assets of Australian branches of a non-resident, and apply CGT to non-portfolio interests in interposed entities (including foreign interposed entities), where the value of such an interest is wholly or principally attributable to Australian real property.

[16] These exceptions will soon be changed to apply to most temporary visa holders, rather than all short-term residents.

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ANNEX A
REVIEW OF POSSIBLE 'LOCK-IN' EFFECTS OF CGT

Under a realization-based capital gains tax system, the ability to defer tax on accumulated gains on shares (or another asset generating gains) by postponing the sale of those shares, may discourage sales, at least in certain cases. This so-called "lock-in" effect raises efficiency concerns where savings decisions are distorted towards portfolios with lower pre-tax rates of return for a given level of risk, or higher risk relative to expected return, compared to allocations that would be observed under an accrual-based system. Similarly, concerns are raised where shareholders are discouraged from disposing assets and investing the funds in more productive investments, for example a new business enterprise capable of generating a higher pre- tax rate of return than the invested shares.1

This annex presents a simple two-period model along the lines of the one used by Green and Sheshinski (1978) to illustrate the lock-in effect and resulting inefficient allocation of investment capital. Capital gains tax policy designs implied by the model to neutralize the lock-in effect are discussed. Practical implementation problems associated with these are noted.

1. Illustration of lock-in effect

Consider a simple two-period model in which a representative taxpayer invests initial wealth, taken to be one currency unit (W0=1), in shares paying a variable rate of return in the form of capital gains. Let e1 denote the rate of return on shares in the first period. The shares offer a rate of return of e2 in period 2, also in the form of capital gains, which we assume is known to the investor at the end of the first period.2

At the end of the first period, the investor considers whether to hold the shares in the second period, or instead sell them and invest the after-tax proceeds in an alternative asset, assumed to be bonds. In particular, the investor is assumed to select over the following second-period investment options:

a. sell the shares immediately, pay tax on current (first-period) gains, and invest the after-tax amount in bonds paying a fixed rate of return r, subject to tax at rate t_i, yielding terminal wealth W_S, or

b. hold onto the shares for the second (final) period, and pay capital gains tax at the end of the second period on first and second-period gains, yielding terminal wealth W_H.

Assume that the objective of the investor is to maximize his/her end-of-second period (terminal) wealth.3 For the investor to be indifferent between options a) and b), it must be that they offer the same end of second-period wealth (WS=WH). This condition can be written as follows:

$$(1+e_1(1-t_{c1}))(1+r(1-t_i)) = (1+e_1)(1+e_2)-t_{c2}[(1+e_1)(1+e_2)-1] \quad (A.1)$$

where t_{c1} measures the effective tax rate on first period gains, and t_{c2} measures the effective tax rate on gains accruing over both (two) periods.[4]

For illustrating the lock-in effect, it is useful to derive the second-period return on shares (e_2) as a function of the first-period return on shares, the interest rate on bonds, and applicable tax rates, consistent with "holding-period neutrality" (*i.e.*, consistent with investor indifference between selling versus holding shares, options a) and b)). To solve for e_2, first rewrite equation (A.1) as follows:

$$(1+e_1)(1+e_2)(1-t_{c2}) = (1+e_1(1-t_{c1}))(1+r(1-t_i))-t_{c2} \quad \text{(A.2a)}$$

Dividing both sides of the equation by $(1+e_1)(1-t_{c2})$ and expanding right-hand-side terms gives:

$$(1+e_2) = (1+r(1-t_i)+e_1(1-t_{c1})+r(1-t_i)e_1(1-t_{c1})-t_{c2})/(1+e_1)(1-t_{c2}) \quad \text{(A.2b)}$$

or alternatively,

$$e_2 = (1+r(1-t_i)+e_1(1-t_{c1})+r(1-t_i)e_1(1-t_{c1})-t_{c2}-(1+e_1)(1-t_{c2}))/(1+e_1)(1-t_{c2}). \quad \text{(A.2c)}$$

Expanding the last term in the numerator and simplifying terms gives:

$$e_2 = [r(1-t_i)(1+e_1(1-t_{c1}))-e_1t_{c1}+t_{c2}e_1)]/(1+e_1)(1-t_{c2}) \quad \text{(A.2d)}$$

or alternatively,

$$e_2 = [r(1-t_i)(1+e_1(1-t_{c1}))+e_1(t_{c2}-t_{c1})]/(1+e_1)(1-t_{c2}). \quad \text{(A.2e)}$$

Dividing through by $(1-t_{c2})$ gives:

$$e_2 = [(r(1-t_i)/(1-t_{c2}))(1+e_1(1-t_{c1}))+e_1(t_{c2}-t_{c1})/(1-t_{c2})]/(1+e_1) \quad \text{(A.3)}$$

Lock-in effect in systems with flat (proportional) capital gains tax rates

Consider the case where first period gains are taxed under option a) at the end of period 1 at statutory rate t_{cs}, that is $t_{c1}=t_{cs}$, while under option b) accrued first and second period gains are taxed upon realization at the end of period 2 at the same rate, so that $t_{c1}=t_{c2}=t_{cs}$. This would be the case, for example, where capital gains are taxed at the same flat statutory rate, upon realization, regardless of the holding period and without an interest adjustment to address tax deferral.

The lock-in effect is demonstrated by deriving the pre-tax rate of return that the shares would have to offer in the second period (e_2) in order to satisfy the neutrality condition, given by (A.3). In this case, the second-period return providing for a neutral result is as follows:

$$e_2 = [(r(1-t_i)/(1-t_{cs}))(1+e_1(1-t_{cs}))]/(1+e_1) \quad \text{(A.4)}$$

If the tax rate on capital gains equals that on bonds, that is, $t_{cs}=t_i=t$ (as could occur in a system that taxes capital gains in full as ordinary income), the neutral second-period return is: [5]

$$e_2 = r(1+e_1(1-t))/(1+e_1) \quad \text{(A.5)}$$

With $((1+e_1(1-t))/(1+e_1))<1$ for positive values of t, this result shows that where gains are taxed as ordinary income on a realization basis, the investor is indifferent between holding versus selling shares where the rate of return on shares is less than that on bonds (with both options yielding the same terminal wealth), demonstrating the "lock-in" effect. The investor is willing to accept a lower return on shares as a result of the deferral advantage (deferring capital gains tax on first period earnings) obtained where shares are held.

Where the second-period rate of return on shares e_2 is higher than the indifference value given by (A.5) but less than the market rate of interest, the investor would choose to hold onto the shares, rather than sell and invest in bonds. This distortion raises efficiency concerns, given that over the range $(r(1+e_1(1-t))/(1+e_1)<e_2<r)$, the pre-tax rate of return on shares is less than the market interest rate, and yet the lock-in effect discourages portfolio adjustment to assets generating a higher pre-tax rate of return.

The distortion is more pronounced the larger are first-period gains, as this tends to enhance the tax deferral advantages associated with lock-in. This can be demonstrated by differentiating e_2, given by (A.5), with respect to e_1, as follows:[6]

$$(\partial e_2/\partial e_1) = -t(r/(1+e_1)^2)<0 \qquad \text{(A.6)}$$

In other words, the higher is the first-period return and thus the greater are the tax savings tied to deferral, the lower is the pre-tax rate of return on shares that swings the investment decision in favor of holding onto shares, and thus the larger are the potential efficiency losses linked to a realization-based capital gains tax system.

More generally, the greater the stock of accumulated tax-deferred returns, and thus the greater the tax savings tied to deferral, the lower is the pre-tax rate of return on the "locked-in" asset that would maintain investor indifference or preference for not adjusting his/her portfolio, and thus the larger are the potential efficiency losses linked to a realization-based capital gains tax system. The general observation of more pronounced efficiency losses the greater the stock of accumulated unrecognized (untaxed) capital gains applies to both distortions to the allocation of productive capital, and distortions to portfolio allocation.

2. Policy approaches to neutralizing the lock-in effect

Given the lock-in effect tied to deferral advantages of holding shares with significant accumulated gains, and the corresponding portfolio inefficiencies and potential productivity losses, it is useful to consider whether the deferral advantage and the lock-in effects created can be curtailed. This section considers various options suggested by the two-period model.

a) Capital gains tax rates dependent on the holding period

Using (A.1), one can solve for the (realizations-based) capital gains tax rates on first period gains t_{c1} and on accrued first- and second-period gains t_{c2} such that the investor would be neutral between holding shares and bonds where both have the same pre-tax rate of return ($e_2=r$), as follows.

The right-hand-side of equation (A.1) may be written as follows:

$$W_H= (1+e_1)(1+e_2)(1-t_{c2})+t_{c2} = (1+e_1+e_2+e_1e_2)(1-t_{c2})+t_{c2} \qquad \text{(A.7a)}$$

or alternatively,

$$W_H= 1-t_{c2}+e_1(1-t_{c2})+e_2(1-t_{c2})+e_1e_2)(1-t_{c2})+t_{c2} \qquad \text{(A.7b)}$$

which simplifies to the following:

$$W_H= 1+e_1(1-t_{c2})+e_2(1-t_{c2})(1+e_1) \qquad \text{(A.7c)}$$

The left-hand-side of the equation may be written as follows:

$$W_S = (1+e_1)(1+r(1-t_i))-e_1t_{c1}(1+r(1-t_i)) = 1+e_1+(1+e_1)r(1-t_i)-e_1t_{c1}(1+r(1-t_i)) \quad \text{(A.8a)}$$

or alternatively,

$$W_S = 1+e_1(1-t_{c1}(1+r(1-t_i))+r(1-t_i)(1+e_1) \quad \text{(A.8b)}$$

Comparing (A.7c) and (A.8b), we see that if both instruments yield the same second-period return (e_2=r), terminal wealth is the same (W_H=W_S) if the following tax structure applies:

$$t_{c2} = t_{c1}(1+r(1-t_i)) \quad \text{(A.9a)}$$

$$t_{c2}=t_i \quad \text{(A.9b)}$$

The neutral tax structure differentiates between shares held for one or two periods. With accumulated gains on shares held for two periods taxed at t_i and gains on shares held for one period taxed at the lower rate $t_i/(1+r(1-t_i))$ that adjusts for the time-value of money, the deferral advantage with holding onto shares, and thus the lock-in effect, is eliminated.

However, the tax structure given by (A.9) raises several difficulties. First, a system that taxes gains on shares held for one period at a rate below that applied to interest ($t_{c1}<t_i$) would motivate investors to invest (new) funds in shares rather than bonds where both have the same pre-tax rate of return, with:

$$(1+e_1(1-t_{c1}))>(1+r(1-t_i)) \quad \text{where } e_1=r \text{ and } t_{c1}=t_i/(1+r(1-t_i)) \quad \text{(A.10)}$$

Secondly, extending the preceding analysis to the multi-period context suggests that, if for example, the tax rate on gains realized on shares held for a long period (*e.g.* 25 years) is set at the statutory tax rate t_i, then the corresponding tax rate on gains realized on shares held for a year would be very low, if not close to zero, raising revenue and other concerns. In other words, in the actual multi-period policy context, it is not clear how to benchmark the tax structure under this approach – that is, how to choose the reference holding period for which accumulated gains would be taxed at the basic tax rate.

b) Interest penalties for deferred capital gains tax

Alternatively, one might consider applying the same statutory tax rate on interest and realized gains ($t=t_{c1}=t_{c2}=t_i$), but impose and interest charge where taxation of gains is deferred (*e.g.* charge interest at rate r(1-t) on deferred tax on first-period gains), as originally proposed by Vickery (1947). To consider this approach, note that terminal wealth under option b) to hold onto shares can be expressed as follows (using (A.1) with $t=t_{c2}=t_i$)):

$$W_H = (1+e_1)(1+e_2)-t[(1+e_1)(1+e_2)-1] = (1+e_1)(1+e_2)-t[e_1+(1+e_1)e_2] \quad \text{(A.11)}$$

Under option a) to sell the stock and invest in bonds, terminal wealth with ($t=t_{c1}=t_i$) equals:

$$W_S = (1+e_1(1-t))(1+r(1-t)) = (1+e_1)(1+r)-t[e_1(1+r(1-t_i))+(1+e_1)r] \quad \text{(A.12)}$$

Comparing (A.12) and (A.13), we see that if both investments yield the same second-period return (e_2=r), then terminal wealth is equivalent under both options if the government were to charge a taxpayer interest at rate r(1-t) on deferred tax on first-period gains. This approach would address the liquidity problem associated with accrual taxation, with taxation applied upon realization, and would restore neutrality. A problem, however, is that taxpayers and the tax administration would not be able to determine the

actual pattern of gains over the holding period for assets that are hard to value (*e.g.* where active markets do not exist). For example, in the two period model, the total capital gain (accrued over both periods) is known at the time of sale, but the distribution of the gains across the first and second period is not. Thus in general it would be impossible to compute the 'correct' interest charge on accumulated gains that would lead to tax-neutral holding decisions.

c) Interest penalties for deferred capital gains taxed based on notional pattern of gains

An alternative might be to assume that gains accrue uniformly over the holding period, and charge interest on the notional gain that accrued in each period. In the two-period example, with the overall capital gain $[(1+e_1)(1+e_2)-1]$ observable but separate values for e_1 and e_2 being unknown, the notional uniform rate of return could be measured using the following identity relating the unobservable period-specific returns to a notional cumulative average:

$$(1+e_1)(1+e_2)-1 = (1+e_n)^2-1 \qquad \text{(A.13a)}$$

and solving for the notional per-period return as follows:

$$e_n=[(1+e_1)(1+e_2)]^{1/2}-1 \qquad \text{(A.13b)}$$

An interest penalty could then be assessed on the notional first-period gain at rate r(1-t). However, as shown by Green and Sheshinski, the lock-in effect would continue to present itself with investors earning first-period rates of return well in excess of e_n (and second period returns below e_n, and possibly below the market interest rate) encouraged to hold onto their shares to benefit from the (more limited) tax deferral opportunities. Lock-in incentives would, however, generally be less compared to the no-interest-charge case. At the same time it should be recognized that imposition of such a charge would generate calls by taxpayers to allow capital losses to be carried forward with interest.

d) Retrospective taxation

Another mechanism is that proposed by Auerbach (1991). His 'restrospective' capital gains tax approach, like that of Vickery, would tax capital gains upon realization and thereby avoid the liquidity problems met under a true accruals-based (mark-to-market) system. Moreover, it avoids inducing a lock-in effect while also eliminating opportunities for tax arbitrage (*i.e.* tax savings from immediately selling loss-making assets, while holding assets with gains).

While not requiring information on the actual time profile of asset prices, the scheme relies on information on *ex ante expectations of the future asset values* of the capital gains asset (as well as market interest rates), derived based on the assumption of optimal portfolio choice by investors. While this in principle avoids the need for recourse to second-hand markets, it is not clear how in practice expectations of future sales prices based on the shareholder's required rate of return would be determined, and agreed by taxpayers and tax authorities. Perhaps the most difficult feature is that it is possible under the scheme for an investor to be liable for capital gains tax liability on an asset that has generated a capital loss.

e) Holding period neutrality under the Norwegian 'Shareholder Model'

This section uses the two-period framework (considered above) to illustrate the neutrality implications of the 'shareholder model', as elaborated by Norwegian authorities. As noted in the main text, the 'shareholder model', to be implemented in Norway in 2006, restricts personal taxation of capital income to above-normal returns realized as capital gains and/or dividends. That is, a personal allowance is provided for normal returns (received tax free, and thus taxed at the corporate level alone, at 28%), while above-normal returns are taxed at an effective combined corporate and personal tax rate of 48.16% – first at the corporate level at 28%, with the after-corporate tax amount (72%) of the return realized as dividends and/or capital gains taxed at the shareholder level, again at 28%.[7] The combined rate of 48.16% on above-normal returns is significantly higher than the 28% rate applicable under the pre-2006 (RISK) system.[8]

Normal returns are exempt from personal tax by providing a 'tax-sheltered return' on equity shares, equal to acquisition cost times an after-tax normal rate of return, to be allocated between distributed and retained profits. In calculating taxable capital gains, the taxable gain is derived as the selling price, minus the acquisition cost, minus any residual 'tax sheltered returns' not assigned to distributed profit. Excess tax-sheltered returns may be carried forward at an after-tax interest rate equal to the rate used to determine the tax-sheltered return.

In the context of the simple two-period framework, with taxation under the 'shareholder model', the investor considers at the end of the first period, whether to *i)* sell shares with accumulated gains equal to e_1, pay tax at rate t_p on the above-normal return on those gains, and invest the principal and after-tax return in government bonds paying a risk-free rate of return r, subject to tax at rate t_p at the end of the second period, yielding terminal wealth W_L^*, or *ii)* hold the shares in the second (final) period, and pay capital gains tax at the end of the second period on first and second-period gains ($e_1+e_2(1+e_1)$), with an allowance for first and second period gains, yielding terminal wealth W_H^*. For the investor to be indifferent between options, they must offer the same end of second-period wealth. This condition can be written as follows ($W_L^*=W_H^*$):

$$(1+e_1-t_p\{e_1-s\})(1+r(1-t_p)) = (1+e_1)(1+e_2)-t_p\{((1+e_1)(1+e_2)-1)-s(1+r^{cf})-s\} \qquad (A.14)$$

where t_p denotes the (flat) personal tax rate on capital income (28%) applicable to realized capital gains and interest income, and s is the personal allowance rate. The personal allowance (tax-sheltered return) in the first period is s units, where s is the tax-sheltered rate of return, and the principal amount invested is 1 currency unit. Under the first option to invest in bonds in the second period, there is no second period allowance. Under the second scenario, the second period personal allowance equals the first period (unused) allowance of s units, carried forward at rate r^{cf}, plus an additional allowance equal to s units in respect of the (original) principal amount remaining invested in the second period.

Under the shareholder model, the tax-sheltered rate of return is set equal to the normal (risk-free) market rate of return, after corporate tax: that is, $s=r(1-t_c)$, where t_c is the (flat) corporate income tax rate (28%, identical to the flat personal tax rate on capital income). The carry-forward rate r^{cf} is set equal to s. In other words, we have:

$$(1-t_p)=(1-t_c) \qquad (A.15a)$$

$$s=r^{cf}=r(1-t_c) \qquad (A.15b)$$

In the special case where the capital gains asset generates a normal rate of return ($r(1-t_c)$), it is easy to show from (A.14) that the equivalence condition ($W_S^*=W_H^*$) is satisfied. If the asset earns above-normal returns, then a lock-in incentive results with the personal allowance restricted to a normal rate of return. Furthermore, Norwegian authorities point out that the shareholder model is not completely neutral even in the case where assets earn normal rates of return, as the tax sheltered allowance may only be set off against capital gains from the same share. Thus, any excess allowance is lost when the corresponding asset is sold and the sale price is insufficient to absorb the allowance (*i.e.* the treatment of gains and losses is not completely symmetrical).

Notes

1 Distortions to the allocation of household savings (*e.g.* between government bonds and corporate shares) need not necessarily imply distortions to the allocation of productive capital, as the latter may be unrelated to the level of domestic savings allocated to corporate equity (*e.g.* where non-residents investors are the marginal providers of equity capital).

2 The illustration of the lock-in effect assumes (following Green and Sheshinksi (1978)) that shares provide a variable – but not uncertain/risky – rate of return. In particular, the analysis assumes that the second-period rate of return, while unknown at the beginning of the first period, is known by the investor at the end of the first period.

3 This assumption allows the exercise to focus on tax distortions related to lock-in, as opposed to inter-temporal distortions to the consumption versus savings decision common across taxes on investment income.

4 In equation (A.1), the effective tax rate on first period gains t_{c1} is valued at the end of the first period. Thus, if first period gains were taxed hypothetically at the end of the second period at rate τ, then t_{c1} would equal $\tau/(1+r(1-t_i))$ where r is the borrowing rate and t_i is the tax rate at which interest is deducted. In this case, the left-hand side of (A.1), which we can be written as follows $(1+e_1)(1+r(1-t_i))-t_{c1}e_1(1+r(1-t_i))$ would equal $(1+e_1)(1+r(1-t_i))-(\tau/(1+r(1-t_i)))e_1(1+r(1-t_i))$ which reduces to the following end-of-second period amount: $(1+e_1)(1+r(1-t_i))-\tau e_1$. The effective tax rate on accrued first and second period gains tc_2 is measured at the end of the second period.

5 From equation (A.4), the second period return on shares required for neutrality is lower the lower is the statutory tax rate on capital gains t_{cs} relative to the tax rate on interest t_i. This case could arise, for example, where gains and interest are taxed as ordinary income ($t_{cs}=t_i$) but gains are taxed in part (*i.e.* a partial inclusion system). The tax disincentive to sell shares and purchase bonds results from the lock-in effect and the differential tax rate (*i.e.* even with accrual taxation, the second-period return on shares that achieves neutrality would be lower than the interest rate on bonds). To focus on the distortion created by deferral, we consider the case where the statutory tax rate on gains equals the tax rate on interest.

6 The derivative is calculated as $(\partial e_2/\partial e_1) = (1+e_1)r(1-t)-r(1+e_1(1-t))/(1+e_1)^2$ which simplifies as shown in the text.

7 The effective combined rate is calculated as 0.28+0.28(1-0.28)=0.4816.

8 Note that at the same time, top marginal personal tax rates on earned income are being reduced in Norway in 2006 – together, the rate reduction on earned income and the rate increase on above-normal rates of return (realized as dividends and/or capital gains) will reduce incentives to convert earned income to capital income.

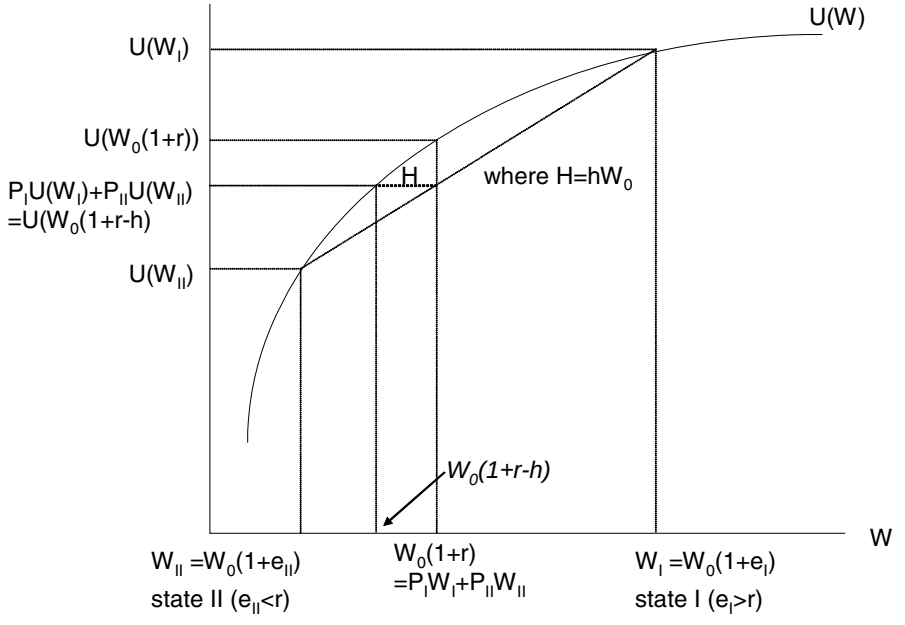
ANNEX B
MEASURES OF RISK AVERSION

This annex reviews what is meant by a 'risk-averse' investor, considers various measures of risk aversion relevant to the analysis of possible effects of taxation on risk-taking, and examines how the degree of (absolute) risk aversion bears on the risk-premium demanded by risk-averse investors.[1]

1. Depiction of risk-averse investor

The standard analysis of possible effects of taxation on risk taking assumes utility (individual welfare) is increasing in wealth, but increasing at a decreasing rate (*i.e.* the utility function of wealth is concave {U'(W)>0, U''(W)<0}, as in Figure A.B.1.) Diminishing marginal utility of wealth implies risk aversion. The more risk averse the investor, the greater is the concavity of the utility function (and the greater the degree of absolute risk aversion R_A, as elaborated below).

Figure A.B.1
Illustration of Risk-Averse Preferences and Risk Premium



A defining feature of a risk-averse investor is as follows:

$$U(W_0(1+r)) > P_I\, U(W_0(1+e_I)) + P_{II}U(W_0(1+e_{II})) \quad \text{(B.1)}$$

with:[2]

$$W_0(1+r) = P_I W_0(1+e_I) + P_{II} W_0(1+e_{II}) \quad \text{(B.2)}$$

where W_0 measures beginning of period wealth, r is a certain return on a notional 'safe' investment in bonds, e_I and e_{II} are uncertain returns on a 'risky' investment in shares with probabilities P_I and $P_{II}=1-P_I$. In other words, a risk-averse investor prefers (his/her utility is higher with) a certain end-of-period wealth $W_0(1+r)$ to a 'risky' or uncertain end-of-period wealth, where the expected (probability-weighted) end-of-period wealth exactly equals end-of-period wealth in the certainty case. This result is consistent with a concave utility function.

2. Measurement of risk premium

As illustrated in Figure A.B.1, a risk-averse investor is indifferent between *i)* an uncertain investment with end-of-period wealth $W_I = W_0(1+e_I)=W_0(1+r+g_I)$ with probability P_I, and $W_{II} = W_0(1+e_{II})=W_0(1+r+g_{II})$ with probability $(1-P_I)$, where $E[g_s]=0$ and $var(g)=E[(g_s-E[g_s])^2]=E[g_s^2]=\sigma_g^2$, and *ii)* a certain investment with end-of-period wealth $W_0(1+r-h)=W_0(1+r)-H$ where $H=hW_0$.

The amount H can be interpreted as the *risk premium* that the investor would have to be paid to give up a risk-free investment with end of period wealth $W_0(1+r-h)$ and accept a risky investment with end-of-period expected wealth $E[W_0(1+e_s)]=E[W_0(1+r+g_s)]=E[W_0(1+r)+G_s)]$ where $G_s=g_sW_0$.[3] Alternatively, H can be interpreted as the risk premium the investor is willing to pay to hold the safe asset generating the same end-of-period wealth as the risk asset and avoid the uncertain prospect (*i.e.* the difference between the expected return on the risky asset and the certainty-equivalent return on the risk-free asset). Under either interpretation, H is such that:

$$U(W_0(1+r)-H)=E[U(W_0(1+r)+G_s)] \quad \text{(B.3)}$$

where G has the following properties:

- expected value: $E[G_s]=E[g_sW_0]=W_0E[g_s]=0$ (B.4a)
- variance: $var(G_s)=E[(G_s-E[G_s])^2]=E[(g_sW_0)^2]=(W_0)^2E[g_s^2]=(W_0)^2\sigma_g^2=\sigma_G^2$ (B.4b)

As derived below, and as seen from Figure A.B.1, the risk premium is increasing with the variance of the risky return and the concavity of the utility function.

The approximate values of the functions appearing in equation (B.3) may be found taking a Taylor-series approximation around the point $W_0(1+r)$.[4] Taking a first-order Taylor series expansion of the left-hand-side, we have:[5]

$$U(W_0(1+r)-H)\approx U(W_0(1+r))+U'(W_0(1+r))\cdot(W_0(1+r)-H-W_0(1+r))$$
$$+U''(W_0(1+r))\cdot(W_0(1+r)-H-W_0(1+r))^2/2 + \ldots \quad \text{(B.5a)}$$

which simplifies to:

$$U(W_0(1+r)-H)\approx U(W_0(1+r))-U'(W_0(1+r))\cdot H+U''(W_0(1+r))\cdot H^2/2 + \text{higher order terms} \quad \text{(B.5b)}$$

Taking a second-order Taylor series expansion of the right-hand-side of (B.3), we have:

$$E[U(W_0(1+r)+G_s)] \approx E[U(W_0(1+r))]+E[U'(W_0(1+r))\cdot(W_0(1+r)+G_s-W_0(1+r))] + E[U''(W_0(1+r))\cdot(W_0(1+r)+G_s-W_0(1+r))^2/2] \quad \text{(B.6a)}$$

which simplifies to:

$$E[U(W_0(1+r)+G_s)] \approx U(W_0(1+r))+U'(W_0(1+r))\cdot E[G_s]+U''(W_0(1+r))\cdot E[G_s^2]/2 \quad \text{(B.6b)}$$

where as previously noted $E[G_s]=0$ and $var(G)=(W_0)^2\sigma_g^2=\sigma_G^2$. Thus (B.6b) can be written as follows:

$$E[U(W_0(1+r)+G_s)] \approx U(W_0(1+r))+U''(W_0(1+r))\cdot\sigma_G^2/2 \quad \text{(B.6c)}$$

Substituting (B.4b) and (B.5c) into the equivalence (B.3) defining the risk premium H, we have:

$$U(W_0(1+r))-H\cdot U'(W_0(1+r)) = U(W_0(1+r))+U''(W_0(1+r))\cdot\sigma_G^2/2 \quad \text{(B.7a)}$$

which reduces to the following (ignoring the term h^2 which would be relatively insignificant):

$$H = -(U''(W_0(1+r))/U'(W_0(1+r))\cdot\sigma_G^2/2 \quad \text{(B.7b)}$$

Using the following definition of absolute risk aversion (R_A) as a function of certain wealth $W_0(1+r)$:

$$R_A = -U''(W_0(1+r))/U'(W_0(1+r)) \quad \text{(B.8)}$$

the risk premium may be expressed simply as follows:

$$H = R_A\cdot\sigma_G^2/2 \quad \text{(B.9)}$$

Thus the risk premium is shown to be increasing in the degree of absolute risk aversion (*i.e.* in the degree of concavity of the utility function), and in the variance of uncertain returns (as is clear from Figure A.B.1, the greater is the concavity of the utility function and the greater is the variance in returns, the larger is the line segment H). With risk premium H, the investor is indifferent between a risk-less (certain) end-of-period wealth $(W_0(1+r)-H)=(W_0(1+r)-R_A\cdot\sigma_G^2/2)$ and an uncertain end-of-period wealth with mean $W_0(1+r)$ and arbitrarily small variance σ_G^2.

R_A and thus the risk premium h may vary with wealth, depending on whether the investor exhibits constant, or increasing or decreasing absolute risk aversion (σ_g^2 would not vary with investor wealth). In the "normal" case of decreasing absolute risk aversion, h would fall as wealth increases, ceteris paribus.

Absolute and relative risk aversion

The two main measures of risk aversion (concerning the shape of the utility function defined over uncertain wealth) found in the literature are as follows:[6]

1. R_A =absolute risk aversion: -U''(W)/U'(W) (logarithmic derivative of marginal utility)
2. R_R =relative risk aversion: -U''(W)W/U'(W) (wealth elasticity of marginal utility)

R_A=-U"(W)/U'(W)) is termed a measure of *absolute* risk aversion as it is used to measure the absolute (*i.e.* level) amount of wealth H that a risk-averse investor would have to be paid to give up a certainty-equivalent end-of-period wealth (W_0(1+r)-H) to accept an uncertain end-of-period wealth W_0(1+r)+G_s) where E[G_s]=0 and where var(G)=σ_G^2.

In the literature, the 'normal' or representative case is typically taken to be one where an investor exhibits decreasing absolute risk aversion – R_A declines as initial wealth increases ($\partial R_A/\partial W_0<0$). In this case, the investor is predicted to hold a larger (level) amount of risky assets in his/her portfolio at higher levels of initial wealth (the wealth elasticity of demand for risky assets is positive ($\eta>0$)). In other words, the risky asset is not an inferior good.

R_R=-U"(W)W/U'(W)) is termed a measure of *relative* risk aversion as it is used to measure the fraction of wealth that a risk-investor would have to be paid to give up a certainty-equivalent end-of-period wealth to accept uncertain end-of-period wealth. Depending on risk preferences (*i.e.*, depending on the marginal utility of wealth at different levels of wealth), the investor may exhibit increasing, constant or decreasing relative risk aversion. With increasing (decreasing) relative risk aversion, the *percentage or fraction* of initial wealth invested in a risky asset decreases (increases) as wealth increases.

Notes

1 See Pratt (1964) and Atkinson and Stiglitz (1980).

2 Figure B.1 considers a hypothetical case where the safe and risky rates of return satisfy B.2 (for a given probability set P_I, P_{II}).

3 Alternatively, the risk premium H=hW_0 may be interpreted as the amount that the risk-averse shareholder would be willing to pay to avoid the risk associated with the risky investment.

4 The general formula for a Taylor series approximation of a function f(x) around the point f(a) is as follows: $f(x)\approx f(a)+f'(a)\cdot(x-a)+f''(a)\cdot(x-a)^2/2!+f'''(a)\cdot(x-a)^3/3!+$higher-order terms.

5 A first-order expansion ignores second-derivative and higher-order terms.

6 Absolute risk aversion is the derivative of marginal utility measured in logs, while relative risk aversion is the wealth elasticity of marginal utility. Both are measured at *end-of-period wealth*, and both are positive for a risk averse investor (with U"(W)<0).

ANNEX C
REVIEW OF POSSIBLE CGT EFFECTS ON PORTFOLIO ALLOCATION (RISK-TAKING)

This annex provides additional detail on the analysis of possible effects of capital gains taxation on risk-taking by individuals, based on the seminal work in this area by Domar and Musgrave (1944), Stiglitz (1969) and Atkinson and Stiglitz (1980). Portfolio allocation is considered first in the no-tax case. The analysis in this part introduces the basic framework, considers the approach used to determine the wealth maximizing demand for risk, and depicts the dependence of the demand for risk on the specification of the investor's risk preferences. The effects of introducing capital gains taxation are then considered, beginning with the case where capital gains and losses are treated symmetrically (full loss offset), and are taxed at the same rate as interest income. These assumptions are then relaxed to consider the (more common) taxation of capital gains/losses with limited loss offset, and to analyze the effects of taxation of capital gains/losses at a preferential effective rate (*e.g.* with partial rather than full inclusion of capital gains/losses).

1. Portfolio allocation in the no-tax case (basic framework)

Consider a risk-averse investor with initial wealth W_0 and two investment possibilities: a risk-free asset paying a certain rate of return r, and a risky asset paying an uncertain return of e_I with probability P_I, and e_{II} with probability P_{II} (with $P_{II}=(1-P_I)$)[1] and where:

$e_I=r+g_I$ where $g_I>0$ (state I with probability P_I) (C.1a)

$e_{II}=r+g_{II}$ where $g_{II}<0$ (state II with probability P_{II}) (C.1b)

All rates of return are assumed to be independent of the amount of capital invested, and r is non-negative.

While the risky return could be in the form of dividends, the analysis focuses on the case of shares generating capital gains or capital losses. The uncertain rate of return exceeds the safe return in the 'good' state I where capital gains are realized, but is less than the safe rate in the 'bad' state II, and may be negative overall, implying capital losses, where the absolute value of g_{II} exceeds r ($|g_{II}|>r$).

Let the letter "a" denote the *fraction* of wealth W_0 invested in the risky asset (implying fraction (1-a) invested in the safe asset). ***The relevant portfolio decision is the choice of the fraction of initial wealth (a) to hold in the risky asset (i.e. the optimal demand for risk).***

Investor wealth at the end of the period is measured by:

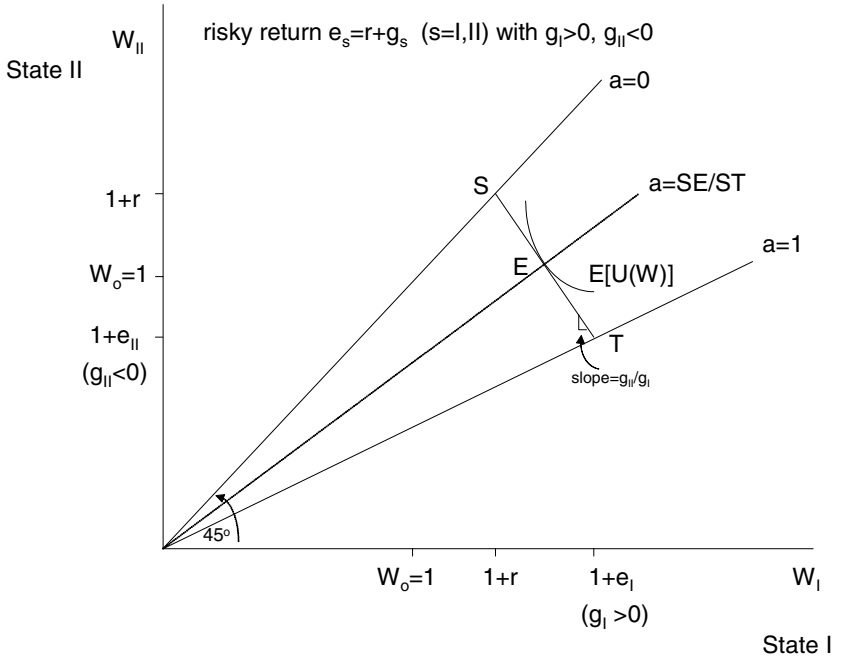
$W_s=W_0(1+ae_s+(1-a)r)$ (s=I, II) (C.2a)

where the letter "s" is used as an index for the two states (s=I, II). The equation for terminal wealth given by (C.2a) may be written alternatively as follows, rearranging terms:

$$W_s=W_0(1+r+a(e_s-r))=W_0(1+r+ag_s) \qquad (s=I, II) \qquad (C.2b)$$

With this information, the investor's *portfolio allocation line* (budget line) may be derived. The portfolio allocation line is shown as line segment S-T in Figure A.C.1 below, which depicts the case where the rate of return on the risky asset is negative in state II (losses are realized, so that terminal wealth is less than initial wealth).[2]

Figure A.C.1
Illustration of Optimal Portfolio Allocation without Shareholder Taxes



At point S in Figure A.C.1, initial wealth W_0 is invested in the safe asset alone (a=0), giving terminal wealth of (1+r) in both states, assuming initial wealth equal to one currency unit (W_0 =1). At point T, all initial wealth is invested in the risky asset (a=1) yielding ($1+e_I$) in state I and ($1+e_{II}$) in state II. A mix of safe and risky assets is held at points along the portfolio allocation line between S and T, with a higher percentage of risky assets held in the portfolio the closer is the equilibrium point to T.

The fraction of initial wealth held in risky assets at the equilibrium point E – that is, the **demand for risk** – is measured by SE/ST (*i.e.*, the length of line segment SE, divided by the length of line ST). The slope of the portfolio allocation line in the no-tax case is given by:

$$\text{slope ST} = (e_{II}-r)/(e_I-r) = g_{II}/g_I \qquad (C.3)$$

The slope shows the constant negative rate at which end-of-period wealth in the bad state II is substituted for end-of-period wealth in the good state I, by varying the fraction of initial period wealth invested in the risky asset.[3] As noted, at point S, all wealth is

invested in the risk-free asset paying r. For a given increase in wealth invested in the risky asset, the larger is the decline in end-of period wealth in the bad state, relative to the increase in wealth in the good state, the more negatively sloped is the portfolio allocation line. In other words, the less (more) favourable is the return from the risky investment in state I relative to the return in state II, the steeper (flatter) is the portfolio allocation line (implying less social risk-taking, as reviewed below).

The next part examines the optimal portfolio allocation decision, where it is assumed that the investor allocates his/her portfolio between the risk-free and risky-assets to maximize the expected utility of end-of-period or terminal wealth.[4]

Wealth Maximizing Demand for Risk

From equation (C.2b), expected utility of end-of-period wealth is given by the following:

$$E[U(W)] = E[U(W_0(1+r+a(e_s-r)))] \tag{C.4}$$

where $E[\cdot]$ denotes an expectations operator.[5] Maximizing $E[U(W)]$ with respect to the risk fraction (a) (by solving $(\partial E[U(W)]/\partial a = 0)$ yields the following ***first-order condition for optimal portfolio allocation***:

$$E[(\partial U(W)/\partial W)\cdot\partial W/\partial a] = E[U'(W)\cdot W_0(e_s-r)] = W_0E[U'(W)\cdot(e_s-r)]$$
$$= E[U'(W)\cdot(e_s-r)] = 0 \tag{C.5a}$$

where W denotes end-of-period (terminal) wealth. At the optimal level of risk, the marginal utility of allocating additional wealth to the risky asset is zero. With initial wealth known, the term W_0 moves outside the expectations operator and cancels out. In the two-state case, the first-order condition can be written as:

$$E[U'(W)\cdot(e_s-r)] = P_I\cdot U'(W_I)\cdot(e_I-r)+P_{II}\cdot U'(W_{II})\cdot(e_{II}-r) = 0 \tag{C.5b}$$

or alternatively:

$$P_I\cdot U'(W_I)/P_{II}\cdot U'(W_{II}) = -(e_{II}-r)/(e_I-r) = -g_{II}/g_I > 0 \tag{C.5c}$$

In other words, the investor maximizes expected utility from end-of-period wealth at the point where the expected utility function is tangent with the portfolio allocation line – that is, where the marginal rate of substitution between (probability-weighted) state I wealth and state II wealth just equals the (negative of the) slope of the portfolio allocation line.[6] The equilibrium is shown as point E in Figure A.C.1.

Let $R=aW_0$ measure the level (as opposed to percentage) demand for the risky asset, with the optimal fraction (a) of initial wealth held in the risk asset determined by first-order condition (C.5a) in the general case. In the two-state case, the optimal fraction (a), assessed as SE/ST in Figure A.C.1, is determined from first-order condition (C.5c). The solution to the optimal demand for risk requires specification of the investor's utility function, which in turn depends on assumptions over the risk preferences of the representative individual investor.

Comparative static analysis of the equilibrium condition (C.5a) may be used to derive the expression for the *wealth elasticity of demand for the risky asset* – that is, the percentage change in demand for the risky asset resulting from a 1% increase in initial wealth.

Wealth elasticity of demand for risky assets (η) in the no-tax case

Comparative static analysis of the no-tax equilibrium condition given by equation (C.5a) may be used to consider the influence of the level of wealth on risk-taking, and in particular to derive the formula for the wealth elasticity of the (level) demand for risky assets. Differentiating the equilibrium condition (C.5a) with respect to initial period wealth gives:

$$\partial E[U'(W)\cdot(e_s-r)]/\partial W_0 = E[(e-r)U''(W)\cdot\partial W/\partial W_0] = 0 \quad \text{(C.6)}$$

From equation (C.2b), end-of-period wealth can be expressed as follows:

$$W=W_0(1+r)+aW_0(e_s-r)=W_0(1+r)+R(e_s-r) \quad \text{(C.7)}$$

where R denotes the equilibrium level demand for the risky asset ($R=aW_0$). Using (C.7), the change in end-of-period wealth from a unit increase in initial wealth can be derived as follows:

$$\partial W/\partial W_0=(1+r)+(e_s-r)\partial R/\partial W_0 \quad \text{(C.8)}$$

which incorporates the assumption that the risky return e is invariant to the amount of initial wealth invested in the risky asset. Substituting result (C.8) into (C.6) gives the following:

$$E[(e_s-r)U''(W)\cdot((1+r)+(e_s-r)\partial R/\partial W_0)] = 0 \quad \text{(C.9a)}$$

which can be written as follows (with the value of the safe return r being known):

$$(1+r)E[U''(W)(e_s-r)] + (\partial R/\partial W_0)E[U''(W)(e_s-r)^2] = 0 \quad \text{(C.9b)}$$

Rearranging terms (and using $W_0/R=1/a$), gives the following solution for the *wealth elasticity of demand for the risky asset*:

$$\eta=(\partial R/\partial W_0)/(W_0/R) = ((1+r)/a)E[U''(W)(e_s-r)]/E[-U''(W)(e_s-r)^2] \quad \text{(C.10)}$$

For a risk-averse investor, the utility function is concave ($U''(W)<0$), and therefore the denominator $E[-U''(W)(e_s-r)^2]$ is unambiguously positive. The sign of the wealth elasticity of demand for risk thus depends on the sign of the second numerator term $E[U''(W)(e_s-r)]$. In particular, the wealth elasticity of demand for the risky asset η is positive or negative as $E[U''(W)(e_s-r)]$ is positive or negative.

In the "normal" case where the investor exhibits everywhere decreasing *absolute* risk aversion – that is, the level demand for risk increases as wealth increases – the numerator term $E[U''(W)(e_s-r)]$ is positive, and therefore the wealth elasticity of demand for the risky asset is positive ($\eta>0$). That is, the level demand for the risky asset ($R=aW_0$) increases as initial wealth increases.[7] Furthermore, if the investor exhibits everywhere decreasing (increasing) *relative* risk aversion, then the wealth elasticity exceeds (is less than) one.

Figure A.C.2 shows wealth portfolio loci corresponding to three possible cases summarized in Table A.C.1 – increasing, constant or decreasing *relative* risk aversion. The examples all consider increases in the level of wealth which shift the portfolio allocation line (budget line) out in a parallel manner. The wealth portfolio locus for a given utility function is mapped out by passing a line through the equilibrium positions as wealth is changed.[8]

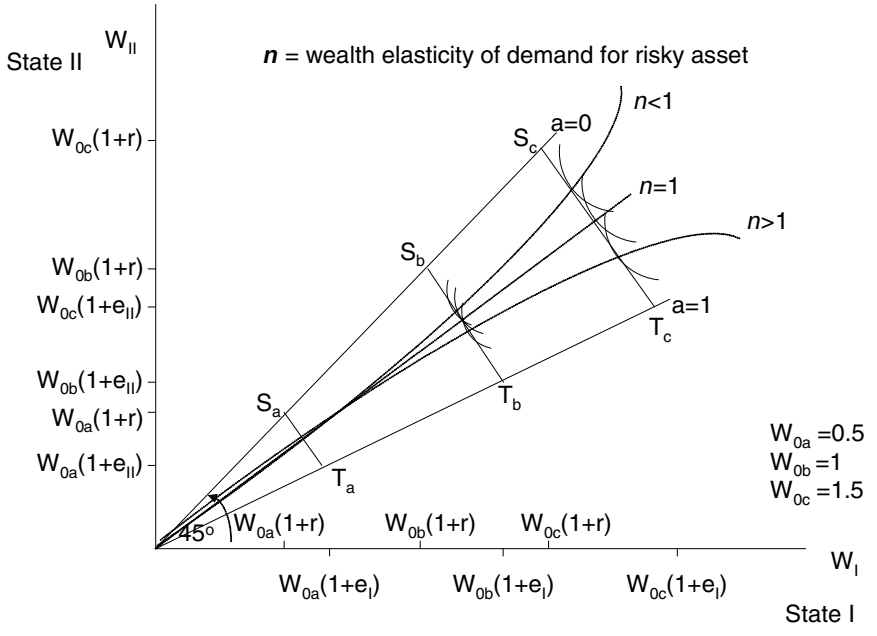
In one case, the *percentage or fraction* of wealth invested in the risky asset falls as wealth increases – in other words, the wealth elasticity of demand for the risky asset is

less than one ($\eta<1$). This case is referred to as one of increasing relative risk aversion. In the second case ($\eta=1$), a constant fraction of wealth is invested in the risky asset at all levels of wealth, consistent with constant relative risk aversion. In the third case, an increasing percentage of wealth is invested in the risky asset as wealth increases (the wealth elasticity exceeds one ($\eta>1$)), implying decreasing relative risk aversion.

Table A.C.1: Summary of cases illustrated in Figure A.C.2

wealth elasticity of demand for risky asset (η)	percentage of wealth invested in risky asset (SE/ST)	relative risk aversion	absolute risk aversion
$\eta<1$	decreases as wealth increases	increasing	decreasing
$\eta=1$	constant as wealth increases	constant	decreasing
$\eta>1$	increases as wealth increases	decreasing	decreasing

Figure A.C.2
Wealth Portfolio Loci and Wealth Elasticity of Demand for Risky Assets
Under alternative Relative Risk Aversion Assumptions



As noted, the "normal" case is taken to be one of decreasing absolute risk aversion, with increasing, constant, or decreasing relative risk aversion dependent on the investors' specific risk preferences. These preferences influence predictions over the affect of tax policy, as reviewed below.

2. Portfolio allocation with taxation

The section introduces personal taxation of investor returns, with the aim of assessing the implications for risk-taking of alternative tax regimes. Three taxes are distinguished:

- wealth tax at rate tw,
- tax on interest income (proportional tax on the risk-free return) at rate t,
- tax on capital gains (proportional tax on the risky return) at an effective rate of tcs, where the effective rate can vary across states s=I, II (e.g. where losses are realized in the 'bad' state).

The following analysis of capital gains tax effects assumes initially that capital gains and losses are subject to the same effective tax rate (symmetric tax treatment of gains and losses). In general, the effective tax rate depends on three factors: timing (accrual versus realization-based taxation); inclusion rate (full or partial inclusion of gains/losses in the tax base); and the statutory tax rate applied to the relevant tax base to which capital gains/losses are assigned. Where capital gains are taxed in full (or partially, *e.g.* half-inclusion) as they accrue, symmetric treatment requires that capital losses be deducted in full (or partially, at the same inclusion rate) as they accrue.[9] Moreover, symmetric treatment requires that capital losses be deducted against a tax base subject to the same statutory tax rate as capital gains. If the taxpayer has insufficient taxable income including taxable capital gains to absorb capital loss deductions, symmetric treatment requires that the taxpayer be able to carry excess capital losses forward, with interest, to be set off against future taxable income.

In general, symmetric treatment of capital gains and losses – termed 'full loss offset' – is not observed in practice.[10] Tax systems typically offer only limited loss offset, by requiring for example that capital losses be deducted only against capital gains, with the result that capital losses in excess of capital gains are not immediately deductible. Moreover, most tax systems do not allow taxpayers to carry forward with interest excess capital losses to be set off against future taxable gains. However, it is instructive to first analyze results from the portfolio allocation model under the assumption of symmetric treatment, which may be used to address implications of partial or limited loss offset.

The risk-free return (*e.g.* interest on government bonds) is taxed at rate t. Capital gains on the risky asset are taxed at rate t_{cI} in the 'good' state I. In state II where $g_{II}<0$, if the investment return e_{II} is less than that on bonds but positive ($|g_{II}|<r$), the relevant tax rate is the same as in the good state ($t_{cII}=t_{cI}$). If instead losses are realized ($|g_{II}|>r$ so that the return is negative $e_{II}<0$), the relevant tax rate is t_{cII} is the same as that in the 'good'state ($t_{cII}=t_{cI}$) if symmetric treatment is provided. If as is common in OECD countries asymmetric treatment is provided (*e.g.* less than full-offset), then the effective tax rate would be less than t_{cI}. (For example, in the section below examining limited loss offset, the relevant tax rate in the loss-position case is modelled as $t_{cII}=\alpha t_{cI}$ with the parameter $0\leq\alpha<1$ used as a measure of the degree of loss-offset provided).

With wealth tax at rate t_w, tax on interest income at rate t, and taxation of capital gains/losses at rate t_{cs} (s=I,II) the investor's end-of-period wealth is measured by the following (based on equation C.2a):

$$W=(1-t_w)W_0(1+ae_s(1-t_{cs})+(1-a)r(1-t))=(1-t_w)W_0(1+r(1-t)+a(e_s(1-t_{cs})-r(1-t))) \qquad (C.11)$$

where as in the no-tax case, 'a' denotes the fraction of initial wealth invested in the risky asset, r denotes the safe return, and e_s denotes the risky return over the two states.

a) Optimality condition for risk-taking in the presence of tax

Consider now the investor's optimal portfolio allocation decision (wealth maximizing demand for risk) in the presence of tax where, as in the no-tax case, it is assumed that the representative individual seeks to maximize expected utility of end-of-period wealth. Based on equation (C.11), expected utility of end-of-period wealth is given by the following:

$$E[U(W)] = E[U((1-t_w)W_0(1+r(1-t)+a(e_s(1-t_{cs})-r(1-t))))] \quad \text{(C.12a)}$$

In the case of two possible states, we have:

$$E[U(W)] = E[U(W_I,W_{II})] = P_I \cdot U(W_I) + P_{II} \cdot U(W_{II})$$

$$= P_I \cdot U((1-t_w)W_0(1+r(1-t)+a(e_I(1-t_{cI})-r(1-t))))$$

$$+P_{II} \cdot U((1-t_w)W_0(1+r(1-t)+a(e_{II}(1-t_{cII})-r(1-t)))) \quad \text{(C.12b)}$$

where E[·] denotes the expectations operator, and allowance is made for the possibility that the effective capital gains tax rate may differ across states (*e.g.* in the treatment of gains versus losses). The slope of the expected utility function is measured by $E[-U'(W_I)/U'(W_{II})]$ or alternatively $(-P_I \cdot U'(W_I)/P_{II} \cdot U'(W_{II}))$.

Maximizing E[U(W)] with respect to the risk fraction (a) (by solving $(\partial E[U(W)]/\partial a=0)$ yields the following ***first-order condition for optimal portfolio allocation***:

$$E[U'(W) \cdot \partial W/\partial a] = (1-t_w)W_0 E[U'(W) \cdot (e_s(1-t_{cs})-r(1-t))] = 0 \quad \text{(C.13a)}$$

The leading term $(1-t_w)W_0$ cancels out, giving the following equilibrium condition for risk:

$$E[U'(W) \cdot (e_s(1-t_{cs})-r(1-t))] = 0 \quad \text{(C.13b)}$$

While the leading term $(1-t_w)W_o$ cancels, the first-order condition is a function of not only the capital gains tax rate t_{cs} and income tax rate t, but also the wealth tax t_w, and initial wealth W_0, as the marginal utility function is assessed at end-of-period wealth, measured by (C.11), which depends on these variables.

b) Analysis of wealth tax effects

In considering the effects of wealth taxation on risk-taking, one may first observe from equation (C.11) that the wealth tax rate t_w influences terminal wealth solely through the leading term $(1-t_w)W_0$. An immediate implication is that the introduction of a wealth tax, or an increase in the wealth tax rate, involves a parallel shift in the portfolio allocation line, analogous to the impact of a reduction in initial wealth. As illustrated above with reference to Figure A.C.2, a 50% reduction in initial wealth from one unit ($W_{0b}=1$) to one-half a currency unit ($W_{0a}=0.5$) causes an inward parallel shift in the portfolio allocation line from S_bT_b to S_aT_a. The same shift would be observed if instead a 50% wealth tax were introduced.

Introducing or altering the rate of wealth taxation does not affect the slope of the portfolio allocation line (as noted, a parallel shift), as a general wealth tax does not alter the rate at which wealth in the bad state is traded off against that in the good state by varying the amount of wealth invested in the risky assets.

With the wealth tax involving solely wealth effects (no substitution effects), the introduction of a wealth tax or an increase in its rate would be expected to reduce the level demand for risky assets in the "normal" case where the investor exhibits decreasing absolute risk aversion implying a positive wealth elasticity of demand for the risky asset. The demand for risk (the *fraction* of wealth invested in risky assets) would be expected to increase, remain constant, or decrease, depending on whether the investor's risk preferences exhibit increasing, constant or decreasing relative risk aversion.

Formally, the influence of a wealth tax on risk can be examined through comparative static analysis of the equilibrium condition given by (C.13b). In focusing on wealth tax effects, the simplest illustrative case is where full loss offset is provided (symmetric treatment of capital gains/losses, so that $t_{cI}=t_{cII}$), and capital gains/losses are taxed at ordinary income along with interest income (non-preferential treatment), so that we have ($t_{cI}=t_{cII}=t$). In this case, the general equilibrium condition for risk given by (C13.b) becomes:

$$[U'(W)\cdot(1-t)(e_s-r)] = (1-t)E[U'(W)\cdot(e_s-r)] = 0 \qquad \text{(C.14a)}$$

which simplifies to:

$$E[U'(W)\cdot(e_s-r)] = 0 \qquad \text{(C.14b)}$$

While the tax term (1-t) cancels, the first-order condition is a function of the tax rate t on investment returns, as well as the wealth tax t_w and initial wealth W_0, as these variables impact terminal wealth, as measured by equation (C.11), and therefore factor into the marginal utility function.

The impact of wealth taxation on risk-taking is determined by comparative static analysis of the optimality condition. Differentiating condition (C.14b) with respect to the wealth tax rate gives:

$$\partial E[U'(W)\cdot(e_s-r)]/\partial t_w = E[(e_s-r)U''(W)\cdot\partial W/\partial t_w] = 0 \qquad \text{(C.15)}$$

Using equation (C.11), and considering the full loss-offset case with gains/losses taxed at the same rate as interest ($t_{cI}=t_{cII}=t$), the derivative of end-of-period wealth with respect to t_w is given by:

$$\partial W/\partial t_w=(1-t_w)W_0(1-t)(e_s-r)\partial a/\partial t_w - W_0(1+(1-t)(r+a(e_s-r))) \qquad \text{(C.16)}$$

Substituting this result into (C.15) gives:

$$E[(e_s-r)U''(W)\cdot(\partial a/\partial t_w\cdot W_0(1-t_w)(1-t)(e_s-r)-W_0(1+(1-t)(r+a(e_s-r))))]=0 \qquad \text{(C.17a)}$$

Moving terms known with certainty (including the control variable a) outside the expectations operator E[·] and rearranging terms, we have:

$$W_0(1-t_w)(1-t)(\partial a/\partial t_w)E[U''(W)(e_s-r)^2]=W_0(1+r(1-t))E[U''(W)(e_s-r)]$$
$$+aW_0(1-t)E[U''(W)(e_s-r)^2]=0 \qquad \text{(C.17b)}$$

Dividing through by $aW_0(1-t)E[U''(W)(e_s-r)^2]$ gives the following:

$$(\partial a/\partial t_w)((1-t_w)/a)=1-((1+r(1-t))/a(1-t))E[U''(W)(e_s-r)]/E[-U''(W)(e_s-r)^2] \qquad \text{(C.17c)}$$

As elaborated below, the ***wealth elasticity of demand for risky assets η in the presence of taxation***, with gains taxed as ordinary income ($t_{cI}=t_{cII}=t$), is given by:

$$\eta=((1+r(1-t))/a(1-t))E[U''(W)(e_s-r)]/E[-U''(W)(e_s-r)^2] \qquad \text{(C.18)}$$

Using (C.17c) and (C.18), the ***elasticity of demand for risk with respect to the wealth tax*** is given by:

$$\varepsilon=(\partial a/\partial t_w)((1-t_w)/a)=1-\eta \qquad \text{(C.19)}$$

This result shows the symmetrical effects of the wealth tax and initial wealth on the demand for risk. An increase in the wealth tax rate impacts the demand for risky assets in the same way as a reduction in initial wealth – both cause the portfolio allocation line to shift inwards in a parallel fashion (wealth effect alone), with the impact on the demand for risky assets depending on investor risk preferences (increasing, constant or decreasing relative risk aversion – see Table A.C.2).

In the "normal" case of decreasing absolute risk aversion, the amount of risky assets held would fall with an increase in wealth tax. The demand for risk – that is, the fraction of wealth invested in risky assets – would increase, remain constant or decrease as the investor's risk preferences exhibit increasing, constant or decreasing relative risk aversion.

Table A.C.2
Possible Effects on Wealth Tax on Demand for Risk

risk preferences of investor	wealth elasticity of demand for risk	elasticity of demand for risk with respect to the wealth tax rate	impact of increase in wealth tax rate t_w on demand for risk (a)
increasing relative risk aversion (decreasing percentage portfolio allocation to risk as wealth increases)	$0\leq \eta<1$	$0<\varepsilon \leq 1$	increases
constant relative risk aversion (same percentage portfolio allocation to risk at all levels of initial wealth)	$\eta=1$	$\varepsilon=0$	no impact
decreasing relative risk aversion (increasing percentage portfolio allocation to risk as wealth increases)	$\eta>1$	$\varepsilon<0$	decreases

Wealth elasticity of demand for risky assets (η) in the presence of taxation

The preceding result for the elasticity of demand for risk with respect to the wealth tax (C.19) incorporates a measure of the wealth elasticity of demand for risky assets in the presence of taxation. The wealth elasticity measure η shown as (C.18) is derived by totally differentiating the first-order condition (C.14b) with respect to initial wealth W_0:

$$\partial E[U'(W)\cdot(e_s-r)]/\partial W_0 = E[(e_s-r)U''(W)\cdot\partial W/\partial W_0] = 0 \qquad \text{(C.20)}$$

Using equation (C.11), the derivative of end-of-period wealth with respect to initial wealth is given by:

$$\partial W/\partial W_0=(1-t_w)(1+r(1-t)+(1-t)(e_s-r)\partial R/\partial W_0) \qquad \text{(C.21)}$$

Substituting this result into (C.20) gives:

$$E[(e_s-r)U''(W)\cdot(1-t_w)(1+r(1-t)+(1-t)(e_s-r)\partial R/\partial W_0)] = 0 \qquad \text{(C.22a)}$$

where as in the no-tax case $R=aW_0$ measures the level demand for the risky asset and where ($t_{cI}=t_{cII}=t$). Simplifying this expression (moving $(1-t_w)$ outside $E[\cdot]$ and canceling out and rearranging terms) gives:

$$(\partial R/\partial W_0)=E[U''(W)(e_s-r)(1+r(1-t))]/E[-U''(W)(e_s-r)^2](1-t) \qquad \text{(C.22b)}$$

Expressing this result in elasticity form (using $W_0/R=1/a$) we have the following measure of the wealth elasticity of demand for the risky asset (reported above as (C.18)):

$$\eta=(\partial R/\partial W_0)(W_0/R) =((1+r(1-t))/a(1-t))E[U"(W)(e_s-r)]/E[-U"(W)(e_s-r)^2] \quad \text{(C.23)}$$

The denominator of (C.23) is unambiguously positive assuming a risk-averse investor ($U"(W)<0$). Thus elasticity η has the same sign as $E[U"(W)(e_s-r)]$. As noted above in the review of determinants of η in the no-tax case (see the discussion of C.10), this term is positive in the "normal" case where the level demand for risky asset increases with wealth. The ratio of expectations terms in (C.23) can be expressed in terms of the elasticity η as follows:

$$E[U"(W)(e_s-r)]/E[-U"(W)(e_s-r)^2]=\eta a(1-t)/(1+r(1-t)) \quad \text{(C.24)}$$

This result is used to interpret the result measuring the effect of capital gains taxation on social risk taking.

c) Analysis of capital gains tax effects (gains/losses taxed as interest income, full loss offset)

As noted above in analyzing wealth tax effects, with capital gains/losses taxed as interest income and full offset provided ($t_{cI}=t_{cII}=t$), the optimality condition for risk-taking is given by the following (see C.14b):

$$E[U'(W)\cdot(e_s-r)]=0 \quad \text{(C.25)}$$

The first-order condition (C.25), which appears identical to the corresponding condition in the no-tax case (C.5a), in fact differs, as end-of-period wealth (W) is a function of the tax parameters (t_w, t_c and t).

The slope of the portfolio allocation line is the same as that in the no-tax case (see result (C.3)):[11]

$$\text{slope } S_2T_2 = (e_{II}-r)/(e_I-r) = g_{II}/g_I \quad \text{(C.26)}$$

Comparing this with result (C.3), the slope of the portfolio allocation line is unchanged from the no-tax case. With capital gains/losses taxed as interest income and full loss offset provided, the tax system reduces terminal wealth, but does so symmetrically across risk-free and risky investments and across states I and II. Introducing a tax on investment returns including capital gains/losses leaves unchanged the rate at which terminal after-tax wealth in state II is substituted for that in the state I, by varying the fraction of wealth invested in the risky asset. This follows where the government is a full partner in the investment, sharing equally in gains and losses through the provision of full loss-offset, and interest and capital gains are taxed at the same rate so that substitution effects are not introduced.[12]

Safe asset earns no return

Assessing the impact of capital gains taxation with full loss-offset is straight forward where the safe asset (*e.g.* cash) earns a zero rate of return (with reference to Figure 2.1 in the main text). Where the safe return is zero (r=0), the formula for terminal wealth, and the optimality condition for risk-taking, are as follows, with reference to equation (C.11)and (C.25):

$$W=(1-t_w)W_0(1+ae_s(1-t)) \quad \text{(C.27a)}$$

$$E[U'(W)\cdot e_s]=0 \quad \text{(C.27b)}$$

With the optimal demand for risk (*i.e.* the optimal fraction of initial wealth invested in the risky asset) in the absence of taxation equal to a^*, it is clear from equation set (C.27) that increasing the fraction of wealth invested in the risky asset from a^* to $a^*/(1-t)$ in the presence of capital gains taxation with full loss offset would leave the investor in the same position, with terminal (net) wealth unchanged in both states and utility maximized.[13]

In the good state I, the after-tax return is the same as in the no-tax case (a higher gross return but same final or net return). Similarly, with the government sharing equally in gains and losses, the after-tax return in the bad state is unchanged. The investor has the same expected end-of-period wealth, and thus the same consumption possibilities and same expected utility as in the no-tax case.[14] However, by increasing the fraction of initial wealth invested in the risky asset from a^* to $a^*/(1-t)$, *social risk* defined as the percentage of wealth placed in an asset with a risky/uncertain return has increased. This result is confirmed below as a special case of the general analysis where the safe return is positive.

Safe assets earns a positive return

Now consider the impact of capital gains tax on risk-taking in the more general case where the safe rate of return r is positive (with reference to Figure 2.2 in the main text). The impact of capital gains taxation on (social) risk-taking, measured by the partial derivative ($\partial a/\partial t$), is solved by totally differentiating first-order condition (C.25) with respect to t:

$$\partial E[U'(W)\cdot(e_s-r)]/\partial t=E[(e_s-r)U''(W)\cdot\partial W/\partial t]=0 \qquad \text{(C.28)}$$

Using equation (C.11), and considering the full loss offset case where ($t_{cI}=t_{cII}=t$), the derivative of terminal wealth with respect to t is given by:

$$\partial W/\partial t=(1-t_w)W_0((1-t)(e-r)\partial a/\partial t-(r+a(e-r))) \qquad \text{(C.29)}$$

Substituting this result into (C.28) gives:

$$E[(e-r)U''(W)\cdot((1-t_w)W_0((1-t)(e-r)\partial a/\partial t-(r+a(e-r))))]=0 \qquad \text{(C.30a)}$$

Rearranging terms (with $(1-t_w)W_0$ canceling out) gives:

$$(1-t)(\partial a/\partial t)E[U''(W)(e-r)^2]=aE[U''(W)(e-r)^2]+rE[U''(W)(e-r)] \qquad \text{(C.30b)}$$

Dividing through by $aE[U''(W)(e-r)^2]$ gives the following measure of the ***impact on (social) risk-taking resulting from capital gains tax with full offset (with $t_{cI}=t_{cII}=t$):***[15]

$$(\partial a/\partial t)((1-t)/a)=1-(r/a)E[U''(W)(e-r)]/E[-U''(W)(e-r)^2] \qquad \text{(C.31a)}$$

This result can be expressed as a function of the investor's wealth elasticity of demand η (see C.23), as follows:

$$(\partial a/\partial t)((1-t)/a)=1-\eta r(1-t)/(1+r(1-t)) \qquad \text{(C.32b)}$$

The preceding result finds that there exists a critical value of the wealth elasticity of demand for the risky asset η^* such that social risk-taking is increased as a result of taxation of investment returns including capital gains for values of η below η^*.

If, for example, the safe return is 5% (r=0.05), the tax rate on investment returns including gains is 25% (t=0.25), and the holding period is one year, the critical wealth elasticity value is 27 ($\eta^*=27$). That is, provided that the wealth elasticity of the demand for risky assets is less than 27, the model predicts increased risk-taking ($\partial a/\partial t>0$). Where the tax rate is 50% (t=0.5), the critical elasticity value is 41 ($\eta^*=41$). If instead the

holding period is 25 years, so that the approximate interest rate in the one-period model is roughly 200% (r=2.0), the critical wealth elasticity value is about 2

A positive substitution effect towards risk taking results from the government's sharing in investment risk through full loss offset, which increases the return (reduces the loss) in the event of the bad state II. In the 'normal' case of decreasing absolute risk aversion, there is an offsetting wealth effect, as the tax on investment returns reduces investor wealth (which lowers the level demand for risk in the normal case).[16] Where the investors risk preferences are such that the wealth elasticity of demand for risk falls below a critical value ($\eta<\eta^*$), the substitution effect towards increased risk taking more than offsets the wealth effect towards reduced risk taking, such that risk taking increases overall. As noted abovethe critical value of the wealth elasticity of demand for risk (η^*) is a function of the safe rate of return r, the tax rate t on investment income (capital gains and interest income), and the holding period.

d) Portfolio allocation with limited loss offset

This section relaxes the assumption of full loss offset to consider the more representative case where the investor is unable to claim a current deduction for allowable capital losses in excess of taxable capital gains, and is not allowed to carry forward unused capital losses with interest.

For the purpose of isolating limited loss offset effects, assume that capital gains are taxed at rate t in the 'good' state, while in the 'bad' state only a fraction $\alpha<1$ of capital losses may be deducted at rate t. Thus the capital gains/loss tax rate variable t_{cs} appearing in the terminal wealth formula (C.11) and optimality condition (C.13b) may be defined as follows:

$$t_{cI}=t \quad \text{(state I with } e_I>0) \tag{C.33a}$$

$$t_{cII}= \alpha \cdot t \text{ (state II with } e_{II}<0, \text{ with } 0<\alpha<1) \tag{C.33b}$$

The slope of the portfolio allocation line is given by:[17]

$$\text{slope } S_jT_j = =(g_{II}/g_I)+t(1-\alpha)e_{II}/(1-t)g_I \tag{C.34}$$

The first right-hand-side term measures the (negative) slope of the budget line in the case where full loss offset is provided (see (C.26)). The second term is also negative where capital losses are incurred (with $e_{II}<0$) and loss offset is limited with $0<\alpha<1$ (note that $g_I>0$ in the 'good' state). Thus with less than full loss offset, the portfolio allocation line is more negatively sloped than when full offset is provided. The slope is steeper the further removed the system is from providing full loss-offset (*i.e.* the smaller is α), the larger is the tax rate t, and the larger is the (expected) capital loss in the 'bad' state relative to the (expected) capital gain in the 'good' state.

The impact of the loss-offset restriction on the demand for risk can be assessed by totally differentiating the optimality condition for the demand for risk with respect to the loss-offset parameter α – where a higher (lower) value of α indicates more (less) tax relief for losses. Differentiating first-order condition (C13.b) with respect to α, letting $t_w=0$ for simplicity without affecting the direction of the results, and using the terminal wealth measure (C.11) to assess how terminal wealth varies with α, gives:

$$\partial E[U'(W)\cdot(e_{ns}-r_n)]/\partial\alpha=E[U'(W)(\partial e_{ns}/\partial\alpha) + (e_{ns}-r_n)U''(W)W_0\{a(\partial e_{ns}/\partial\alpha)+(e_{ns}-r_n)(\partial a/\partial\alpha)\}]=0 \tag{C.35}$$

where r_{ns} and e_{ns} denote the following net rates of return, using the tax rate specification with limited loss offset given by equation set (C.33):

$$r_n=r(1-t) \tag{C.36a}$$

$$e_{nI}=e_I(1-t) \quad \text{(for s=I)} \tag{C.36b}$$

$$e_{nII}=e_{II}(1-\alpha t) \quad \text{(for s=II (asymmetric treatment) with } 0\leq\alpha<1) \tag{C.36c}$$

The comparative static result (C.35) may be written as follows:

$$E[U'(W)(\partial e_{ns}/\partial\alpha)+W_0\{U''(W)(e_{ns}-r_n)a(\partial e_{ns}/\partial\alpha)+U''(W)(e_{ns}-r_n)^2(\partial a/\partial\alpha)\}]=0 \tag{C.37a}$$

Rearranging terms and moving terms know with certainty outside the expectations operator gives:

$$(\partial a/\partial\alpha)=\{E[(\partial e_{ns}/\partial\alpha)(U'(W)+aW_0U''(W)(e_{ns}-r_n))]\}/W_0E[-U''(W)(e_{ns}-r_n)^2] \tag{C.37b}$$

or equivalently:

$$(\partial a/\partial\alpha)=\{E[(\partial e_{ns}/\partial\alpha)]\cdot E[U'(W)/W_0+aU''(W)(e_{ns}-r_n)]\}/E[-U''(W)(e_{ns}-r_n)^2] \tag{C.37c}$$

The term in the denominator is unambiguously positive, assuming a risk averse investor (concave utility function). Thus the sign of the derivative $(\partial a/\partial\alpha)$ depends on the sign of the term in the numerator in { } brackets, which in turn depends on the derivative of the expected risky net rate of return with respect to the loss-offset parameter $(\partial e_{ns}/\partial\alpha)$, and on how this change impacts the marginal utility of wealth which is everywhere positive U'(W)>0, and a third term capturing wealth effects. The numerator term U'(W)/W0 factors into the comparative static result in this case because the reform alters the relative (net) rate of return on the risky asset and the safe asset, affecting only the net return to the risky asset (and only in the 'bad' state where the reform applies), while leaving unchanged the tax rate on interest.

With the loss-offset parameter applying asymmetrically (only in state II) the derivative $\partial e_{ns}/\partial\alpha$ is evaluated only in the second state where $(e_{II}<0)$, with the derivative having a positive value:

$$E[(\partial e_{nII}/\partial\alpha)]= -tE[e_{II}]>0 \tag{C.38}$$

That is, an increase in the loss-offset parameter increases the expected net return in state II where losses are realized. Or in other words, the investor's net (after-tax) loss is lower with the government bearing a larger share of the loss. As noted, this imparts a change in relative rates of return on the risky versus safe asset and applies only in the 'bad' state.

With the marginal utility of wealth everywhere positive U'(W)>0, and assuming the 'normal' case of decreasing absolute risk aversion, the second numerator term of (C.37c) is also positive, and thus the numerator is positive overall.[18] We therefore have the following result:

$$(\partial a/\partial\alpha)>0 \tag{C.39}$$

A positive substitution effect (increased risk-taking) accompanying liberalized loss offset provisions is reinforced by a positive wealth effect in the direction of increased demand for the risky asset. Overall the model predicts unambiguously that increasing the degree of loss-offsetting will increase social risk-taking (the proportion of wealth invested in risky assets), while reducing scope for loss-offsetting will decrease it. Importantly, the unambiguous result occurs owing to the fact that the tax reform affects only one state of the world (the 'bad' state), with reinforcing wealth and substitution effects.

The preceding case considers the risk-taking implications of restricting capital loss offset provisions in a pre-reform system that allows full loss offset. Stiglitz (1969) examines the implications of introducing an income tax that denies capital loss offsets, and finds that risk-taking is unambiguously reduced relative to the no-tax case for a sufficiently high tax rate. In theory, a positive wealth effect could dominate and result in increased risk-taking post-reform (*i.e.* where the investor exhibits strongly increasing relative risk aversion, with the introduction of the tax lowering terminal wealth). However, for a sufficiently high tax rate the substitution effect dominates in the model. To clarify this, consider that for rates of tax approaching 100% with no loss offset, the net return in the 'good' state approaches zero, with the net return in the 'bad' state unchanged, implying a negative expected rate of return overall. Clearly, in this case, the optimal position post-reform is to allocate all wealth to the safe asset. More generally, for sufficiently high tax rates, the introduction of a tax on capital gains and interest, with no or very limited loss offset, would be predicted under the model to lead to reduced risk-taking.

e) Portfolio allocation with preferential treatment of capital gains

This last section considers the risk implications of preferential tax treatment of capital gains compared with interest (safe return), for example through introducing partial inclusion of capital gains matched symmetrically by partial loss offsetting, or the limiting case of a complete capital gains exemption with no capital loss deduction. This type of policy reform is captured by the following characterization of the net rates of return on the safe and risky asset:

$$r_n=r(1-t) \qquad \text{(C.40a)}$$

$$e_{ns}=e_s(1-t_{cs})=e_s(1-(1-\beta)t) \quad \text{(for s=I,II (symmetric treatment) with } 0<\beta\leq 1) \qquad \text{(C.40b)}$$

The capital gains/loss exclusion parameter β applies symmetrically in states I and II, with partial exclusion of gains matched by partial loss offset (*i.e.* the capital gains inclusion rate $(1-\beta)$ matches the capital loss allowance rate $(1-\beta)$). As β tends to one, the effective tax rate $(1-\beta)t$ approaches zero. Also note that introducing partial exclusion of gains/losses distorts the relative rates of return on the risky versus safe asset (unlike the introduction of tax at rate t on investment income including capital gains/losses and interest, considered in section c), which does not affect the relative rates of return).

The slope of the portfolio allocation line, given below, becomes less negatively sloped as β increases:[19]

$$\text{slope } S_2T_2 = (e_{II}(1-(1-\beta)t)-r(1-t))/(e_I(1-(1-\beta)t)-r(1-t)) \qquad \text{(C.41)}$$

The impact on the demand for risk of introducing partial exclusion of capital gains/losses may be assessed by totally differentiating the first-order condition for the demand for risk given by (C.13b) with respect to the policy parameter β, using (C.11) and equation set (C.40) to assess how terminal wealth varies with β (once again letting $t_w=0$ for simplicity without affecting the direction of the results):

$$\partial E[U'(W)\cdot(e_{ns}-r_n)]/\partial\beta=E[U'(W)(\partial e_{ns}/\partial\beta) + (e_{ns}-r_n)U''(W)W_0\{a(\partial e_{ns}/\partial\beta)+(e_{ns}-r_n)(\partial a/\partial\beta)\}]=0 \qquad \text{(C.42a)}$$

Simplifying and rearranging terms gives the following:

$$(\partial a/\partial\beta)=\{E[(\partial e_{ns}/\partial\beta)(U'(W)+a(1-t_w)W_0U''(W)(e_{ns}-r_n))]\}/(1-t_w)W_0E[-U''(W)(e_{ns}-r_n)^2] \quad \text{(C.42b)}$$

or equivalently,

$$(\partial a/\partial\beta)=\{E[(\partial e_{ns}/\partial\beta)]\cdot E[U'(W)/W_0+aU''(W)(e_{ns}-r_n)]\}/E[-U''(W)(e_{ns}-r_n)^2] \quad \text{(C.42c)}$$

with r_n and e_{ns} given by equation set (C.40). The reader will observe that the comparative static result (C.42c) is similar to (C.37c) for the partial loss offset case. In particular, both reforms influence the rate of return on the risky asset relative to the rate of return on bonds. However, while similar, the result above (C.42c) differs importantly from (C.37c) for the partial loss offset case, as the loss offset parameter α applies asymmetrically in state II alone, while the capital/loss exclusion rate β applies symmetrically in both states. As noted below, this leaves the overall implication of the tax reform uncertain.

The denominator term is unambiguously positive (risk-averse investor). The sign of the numerator depends on three terms: the change in the expected net risky rate of return accompanying partial exclusion ($\partial e_{ns}/\partial\beta$), the marginal utility of wealth U'(W) which is positive throughout, and the third numerator term capturing wealth effects, which is also positive in the 'normal' case of decreasing absolute risk aversion.[20] From equation set (C.40), the expected direction of change to the net return on the risky asset from adjusting parameter β differs depending on the state, is as follows:

$$E[(\partial e_{nI}/\partial\beta)] = te_I>0 \quad \text{('good' state)} \quad \text{(C.43a)}$$

$$E[(\partial e_{nII}/\partial\beta)] = te_{II}<0 \quad \text{('bad' state)} \quad \text{(C.43b)}$$

In other words, increasing the capital gains exclusion rate increases the net return in the 'good' state where capital gains are realized. The symmetric reduction in the capital loss allowance decreases the net return in the 'bad' state where losses are realized. As noted above, the reform affects only the net return to capital gains/losses and not the net interest rate on bonds (opportunity cost).

Overall the comparative static result (C.42c) leaves uncertain the impact of the policy change. The reform, which like the previously assessed reform (adjusting the loss claim parameter α alone), alters the relative net rate of return on risky versus safe assets. In so doing, the reform introduces substitution effects not present in the analysis of introducing tax (or adjusting the rate of tax) on investment returns generally, including capital gains/losses and interest. Unlike the previously assessed reform, the shock to β and thus the relative tax rate applies symmetrically. Tax payments are lower when investing in the risky asset and expected utility higher in the 'good' state where gains are realized, with an opposite outcome in the 'bad' state where the subsidy to risk is lower. The net effect of these considerations leaves unclear the implications overall.

In general, a tax reform lowering the gains/loss inclusion rate is more (less) likely to increase risk-taking the higher (lower) is the probability assigned to the 'good' state, and the less (more) risk averse is the investor. However, unlike other reforms reviewed above, the impact of a reduced capital gains inclusion/capital loss allowance rate is ambiguous (*i.e.* the net impact of income and substitution effects cannot be unambiguously derived without information on probabilities of the two states occurring and further assumptions over risk-preferences).

Notes

1 The analysis considers a two-state world (a 'good' state I, and a 'bad' state II) occurring with probabilities P_I and $P_{II}=(1-P_I)$. In the more general case, the risky asset (*e.g.* equity share) yields an uncertain rate of return $e(\theta)$, a function of θ with a probability distribution $F(\theta)$ (see Stiglitz (1969)). Where the investment is in shares, the variable θ could represent, for example, market demand for output of the firm, or management expertise or other factors bearing positively on the rate of return.

2 The analysis assumes that the optimal fraction (a) is in the range $(0\leq a\leq 1)$. This rules out the situation where the individual, rather than investing in the risky asset, sells the risky asset short to purchase the safe asset ($a<0$). It also rules out the possibility of the investor borrowing to purchase the risky asset ($a>1$). A corner solution is ruled out by assuming $E(e)>r$ (a corner solution ($a=0$) exists where $E(e)<r$ (that is, where $P_I \cdot g_I+P_{II} \cdot g_{II}<0$)). The analysis also assumes a risk-averse investor ($U''(W)<0$) (see Annex B). The second-order condition for utility maximization is satisfied under the assumption that the investor is risk-averse.

3 The slope is determined by $((1+e_{II})-(1+r))/((1+e_I)-(1+r))=(e_{II}-r)/(e_I-r)=(g_{II}/g_I)<0$ (with reference to co-ordinates of S and T in Figure C.1), where g measures the amount by which the risky return diverges from the safe return r. The less favourable is the risky return relative to the safe return – that is, the larger is the (negative) wedge between the risky return in the bad state and the safe return (g_{II}), relative to the (positive) wedge between the risky return in the good state and the safe return (g_I) – the more negatively sloped is portfolio allocation line. The slope of this line is known to the investor, but the eventual state (I or II) is not. States I and II (and values of g_I and g_{II}) are assigned probabilities which factor into the equilibrium demand for risk (through the first-order condition for the optimal level of the fraction a).

4 The assumption of maximization of expected utility from terminal wealth allows the analysis to focus away from inter-temporal tax distortions (consumption versus savings) common to taxes on investment income.

5 With two states, $E[U(W)]=P_I \cdot U(W_I)+P_{II} \cdot U(W_{II})=P_I \cdot U(W_0(1+r+a(e_I-r)))+P_{II} \cdot U(W_0(1+r+a(e_{II}-r)))$. The slope of the expected utility function, measured by $E[-U'(W_I)/U'(W_{II})]=(-P_I \cdot U'(W_I)/P_{II} \cdot U'(W_{II}))$, is derived by considering variations in (W_I,W_{II}) holding expected utility constant. Totally differentiating $E[U(W_I,W_{II})]=C$ gives: $dE[U(W_I,W_{II})] =(\partial E[U(W)]/\partial W_I)dW_I+(\partial E[U(W)]/\partial W_{II})dW_{II}=0$. Thus the slope of the expected utility function is $(dW_{II}/dW_I)=-E[U'(W_I)]/E[U'(W_{II})]=-P_IU'(W_I)/P_{II}U'(W_{II}) <0$.

6 The equilibrium condition (C.5c) may be written as: $-U'(W_{II})/U'(W_I)=(P_I \cdot g_I)/(P_{II} \cdot g_{II})$ which ties the probabilities to investment returns rather than utility. At the optimum, the decrease in utility from a decrease in end-of-period wealth in state (II) resulting from increasing (a) at the margin, relative to the increase in utility from an increase in end-of-period wealth in state I resulting from the same change in (a), just equals the expected (constant) rate at which end-of-period wealth is increased in state I relative to that lost in state II by increasing (a). Alternatively, the equilibrium condition may be expressed as: $U'(W_I)P_I \cdot g_I=U'(W_{II})P_{II} \cdot (-g_{II})$. At the optimum, the expected increase in utility in the good state resulting from increasing (a) at the margin just equals the expected decrease in utility in the bad state resulting from increasing (a) at the margin.

7 Using the measure of absolute risk aversion $R_A=-U''(W)/U'(W)$ assessed at terminal wealth (see Annex B), the numerator term of the elasticity η (see C.10) may be written $E[U''(W)(e_s-r)]=-E[R_AU'(W)(e_s-r)]$, or alternatively as $-E[(R_A-R_A^*)U'(W)(e_s-r)]$ using first order condition (C.5a), where R_A^* measures the degree of absolute risk aversion where the risky return equals the safe return (e=r), $R_A^*=R_A(W_0(1+r))$. With decreasing absolute risk aversion ($\partial R_A/\partial W<0$, it follows that when $E[(e_s-r)]>0$ then $(R_A-R_A^*)<0$, while if $E[(e_s-r)]<0$, then $(R_A-R_A^*)>0$. Therefore in the 'normal' case with decreasing absolute risk aversion, $E[U''(W)(e_s-r)]>0$ and thus $\eta>0$, implying that as wealth increases, the (level) amount of wealth invested in risky assets increases.

8 In principle, the wealth elasticity of demand of risky assets is empirically observable.

9 In analyzing the effect of capital gains/losses on risk-taking, the standard approach is to assume and model accrual taxation. In considering results or implications from the model, an accrual-based rate may be converted into a realizations-based-equivalent rate, under an assumed holding period. This approach may be satisfactory where holding periods do not differ in the case of capital gains, versus capital losses. However, the approach is less than satisfactory if in practice individuals tend to hold gains-producing assets (to benefit from deferral) and sell loss-producing assets (if able to claim a current capital loss). The analysis in this paper follows the standard approach of ignoring these timing differences in the formal derivation of results. However, in the simple one-period model, the effects of this mismatch in timing of recognition of losses and gains can be addressed by considering a capital gains tax rate in the good state that is less than that in the bad state.

10 The term 'full loss offset' is used here to mean symmetric treatment of capital gains and losses. Symmetry (full loss offset) should only be interpreted to imply 100 per cent deduction of capital losses where capital gains are included in full in the tax base (100 per cent inclusion of capital gains).

11 The slope $S_jT_j=(W_{II(a=1)j}-W_{II(a=0)j})/(W_{I(a=1)j}-W_{I(a=0)j})=[(1+e_{II}(1-t_{cII}))-(1+r(1-t))]/[(1+e_I(1-t_{cI}))-(1+r(1-t))]$, where j is an index for tax regimes, simplifies to $(e_{II}(1-t_{cII})-r(1-t))/(e_I(1-t_{cI})-r(1-t))$. Where capital gains are taxed as ordinary income and gains/losses are treated symmetrically, so that $t_{cI}=t_{cII}=t$, the slope of the portfolio allocation line is identical to that in the no-tax case: slope $S_2T_2=(e_{II}-r)/(e_I-r)=g_{II}/g_I$.

12 With full loss-offsetting (symmetric treatment of gains/losses), capital gains taxation reduces the standard deviation of returns SD(R), and the expected (mean) return E(R), symmetrically – implying that the ratio E(R)/SD(R) is unchanged. As reviewed in this section, for risk averse investors, capital gains taxation may encourage risk-taking where the wealth elasticity of demand for risky assets is less than one.

13 Where the return on the safe asset is zero (r=0), the comparative static result (C.32b) is $\partial a/\partial t=a/(1-t)$. With full loss-offset, the standard deviation of end-of-period wealth is proportional to a(1-t), which is unchanged by the tax when increasing (a) in proportion to 1/(1-t).

14 This conclusion was first drawn by Stiglitz (1969) in his seminal article on taxation and risk-taking. With r=0 and $t_{cI}=t_{cII}=t$, expected wealth equals $E[W]=P_I\cdot W_I+P_{II}\cdot W_{II}=(1-t_w)W_0(P_I\cdot(1+ae_I(1-t))+P_{II}\cdot(1+ae_{II}(1-t)))$. By increasing $a=a^*$ to $a=a^*/(1-t)$ in the presence of tax at rate t leaves E[W] unchanged. Expected utility $E[U(W)]=P_I\cdot U(W_I)+P_{II}\cdot U(W_{II})=P_I\cdot U((1-t_w)W_0(1+ae_I(1-t)))+P_{II}\cdot U((1-t_w)W_0(1+ae_{II}(1-t)))$ is also unchanged.

15 The result is expressed with a negative sign attached to U"(W) in the denominator (with a corresponding adjustment to the numerator) to facilitate the interpretation of results $(-U"(W)(e-r)^2$ being strictly positive).

16 The analysis assumes that the expected value of the uncertain return on 1 currency unit invested in the risky asset exceeds the certain return on 1 current unit invested in the safe asset. In the two-state world, this condition can be expressed as follows: $(p_I e_I+p_{II}e_{II})>r$ where p_I denotes the probability of the 'good' state I occurring where the expected return on the risky asset is $e_I=g_I+r$ with $(g_I>0)$, and $p_{II}=1-p_I$ is the probability of the 'bad' state with an expected return on the risky asset of $e_{II}=g_{II}+r$ with $(g_{II}<0)$. The expected return assumption may be expressed as follows $(p_I(g_I+r)+p_{II}(g_{II}+r))>r$ which simplifies to $(p_I g_I+p_{II}g_{II})>0$ or alternatively, $(p_I g_I)>-(p_{II}g_{II})$. With symmetric taxation of capital gains/losses at rate t, it follows that $(t\cdot p_I g_I)>-(t\cdot p_{II}g_{II})$. In other words, taxation of gains/losses at rate t implies an anticipated reduction in wealth, despite full loss offset.

17 Slope $ST=(W_{II(a=1)}-W_{II(a=0)})/(W_{I(a=1)}-W_{I(a=0)})=(1-t_w)[(1+e_{II}(1-\alpha t))-(1+r(1-t))]/(1-t_w)[(1+e_I(1-t))-(1+r(1-t))]$ post-tax. Simplifying we have $(e_{II}(1-t+t-\alpha t)-r(1-t))/(1-t)(e_I-r)=(e_{II}-r)/(e_I-r)+t(1-\alpha)e_{II}/(1-t)(e_I-r)$. Using the identity $e_s=r+g_s$ for both states s=I, II, slope $ST=(g_{II}/g_I)+t(1-\alpha)e_{II}/(1-t)g_I$ with $e_{II}<0$. When $\alpha<1$, ST is more negatively sloped. The derivative of the slope with respect to the parameter α is positive $(\partial(\text{slope})/\partial\alpha)=-(te_{II}/(1-t)g_I)>0$. Thus the portfolio allocation line becomes less negatively sloped as the loss offset parameter increases.

18 Using the absolute risk aversion measure $R_A=-U"(W)/U'(W)$, the numerator term $E[aW_0U"(W)(e_{nII}-r_n)]$ may be expressed as $-aW_0E[R_AU'(W)(e_{nII}-r_n)]=-aW_0E[(R_A-R_A^*)U'(W)(e_{nII}-r_n)]$ using first-order condition (C.13ba) where R_A^* measures the degree of absolute risk aversion where the expected net risky return equals the safe return $(E[e_{ns}]=r_n)$, $R_A^*=R_A(W_0(1+r_n))$. With decreasing absolute risk aversion $(\partial R_A/\partial W)<0$, in the second state where $E[(e_{nII}-r_n)]<0$, it follows that $(R_A-R_A^*)>0$. Therefore with decreasing absolute risk aversion, we have: $E[aW_0U"(W)(e_{nII}-r_n)]=-aW_0E[(R_A-R_A^*)U'(W)(e_{nII}-r_n)]>0$.

19 Slope $ST=(W_{II(a=1)}-W_{II(a=0)})/(W_{I(a=1)}-W_{I(a=0)})=(1-t_w)[(1+e_{II}(1-(1-\beta)t))-(1+r(1-t))]/(1-t_w)[(1+e_I(1-(1-\beta)t))-(1+r(1-t))]$ post-tax which reduces to $(e_{II}(1-(1-\beta)t)-r(1-t))/(e_I(1-(1-\beta)t)-r(1-t))$. The derivative of the slope with respect to the exclusion parameter β is positive $(\partial(\text{slope})/\partial\beta)=(-t\cdot r(1-t)(e_{II}-e_I)/(e_I(1-(1-\beta)t)-r(1-t))^2)>0)$. Thus the portfolio allocation line becomes less negatively sloped as parameter β increases.

20 As per footnote 6, $E[aW_0U"(W)(e_{ns}-r_n)]=-aW_0E[R_AU'(W)(e_{ns}-r_n)]=-aW_0E[(R_A-R_A^*)U'(W)(e_{ns}-r_n)]$ where $R_A^*=R_A(W_0(1+r_n))$ is evaluated where $E[e_{ns}]=r_n$. (Note that at the point $E[e_s]=r$, we have $E[e_s(1-t)]=r(1-t)$ or $E[e_{ns}]=r_n$). With decreasing absolute risk aversion, where $E[(e_{ns}-r_n)]>0$, then $(R_A-R_A^*)<0$. And where $E[(e_{ns}-r_n)]<0$, then $(R_A-R_A^*)>0$. Thus $E[a(1-t_w)W_0U"(W)(e_{ns}-r_n)]=-a(1-t_w)W_0E[(R_A-R_A^*)U'(W)(e_{ns}-r_n)]>0$.

ANNEX D
REVIEW OF POSSIBLE CGT EFFECTS ON CORPORATE FINANCIAL POLICY

This annex presents a summary analysis of possible effects of capital gains taxation on the cost of capital influencing corporate financial policy, based on the tax-capitalization model associated with King (1974, 1977), Auerbach (1979), Fullerton and King (1984), Edwards and Keen (1984), and Sinn (1987, 1991).

The review considers cost of capital expressions for three main sources of corporate finance – debt, retained earnings and new share issue – with implications of various settings of alternative setting of personal and corporate tax rates on investment returns. The cost of capital measures the pre-tax real rate of return on productive capital that must be earned at the margin in order to cover corporate financing costs and taxes, and no more. By comparing cost of capital expressions under alternative sources of finance, possible effects on corporate financial policy of shareholder capital gains taxes and dividend taxes are revealed.[1]

In particular, where shareholder taxes cause the cost of capital to be higher under one form of finance as compared with another, the financial policy choice of the firm is distorted towards the latter. The results allow one to consider relative settings of shareholder tax rates (and corporate income tax rates) that could leave the tax system having no distorting effect on firm financial policy, with a neutral outcome (*i.e.* financial policy consistent with that observed in the absence of taxation) generally implying lower dead-weight losses from shareholder-level taxation.

In considering these results, an important reminder is that a policy decision over the setting of the capital gains tax rate will typically depend on a number of considerations, not only efficiency considerations concerning financial policy distortions driven by differences in relative tax rates on retained versus distributed income and interest. A broad-based capital gains tax – applicable to not only gains/losses on corporate shares arising on account of profits/losses at the company level, but also to gains/losses on other assets – raises a broad set of policy dimensions.[2] As reviewed in the main text, many policy issues may weigh in (*e.g.* revenue requirements, equity concerns, efficiency considerations including possible lock-in effects, policy interest in promoting savings and investment). Furthermore, as discussed in the main text, the cost of capital results depend on several key assumptions including the identity and tax treatment of the 'marginal' shareholder.

As elaborated below, cost of capital measures for debt finance (B), new share issue finance (NE), and retained earnings (RE) may be derived as follows in Table A.D.1.

Table A.D.1: Summary of cost of capital measures*

source of finance	after-corporate tax hurdle rate of return	pre-corporate tax hurdle rate of return (cost of capital)
debt (B)	$r(1-u)$	$\pi_B = r$
new equity (NE)	$r(1-t_i)/(1-t_{dp})$	$\pi_{NE} = r(1-t_i)/(1-t_{dp})(1-u)$
retained earnings (RE)	$r(1-t_i)/(1-t_c)$	$\pi_{RE} = r(1-t_i)/(1-t_c)(1-u)$

*The formula consider the case where the corporate tax rate u does not vary between retained and distributed profit..

In the formula derived below, π denotes the pre-tax rate of return on productive (physical) capital required at the margin to cover corporate financing costs and taxes; r denotes the market interest rate on bonds of equivalent risk to shares (taken to be the alternative savings instrument setting the opportunity cost of funds); u_r denotes the corporate income tax (CIT) rate on retained profit; u_d denotes the CIT rate on distributed profit net of any integration relief provided at the corporate level; t_{dp} denotes the personal income tax (PIT) rate on distributed profit net of any integration relief provided at the personal level; t_{cs} denotes the PIT rate on capital gains (statutory rate applied at realisation); t_c denotes the PIT rate on capital gains (effective accrual rate); and t_i denotes the PIT rate on interest on bonds. Where the corporate income tax rate on profit does not differ depending on whether profit is retained or distributed, the corporate tax rate may be denoted simply as u, as in Table A.D.1

1. Analysis of shareholder tax effects

The review in this section describes in words, with reference to some basic algebra, arbitrage assumptions underlying basic cost of capital measures for debt finance, new equity and retained earnings finance, with a focus on the implications of shareholder-level taxation, and considers neutrality implications of alternative approaches to taxing dividends and capital gains. For illustrative purposes, we define the following variables:[3]

Table A.D.2: Variable Definition*

π	pre-tax marginal rate of return on physical capital (declines as the capital stock increases)
r	market rate of interest on bonds (fixed)t
u_r	CIT rate on retained profit
u_d	CIT rate on distributed profit (net of any integration relief provided at the corporate level)
t_{dp}	PIT rate on distributed profit (net of any integration relief provided at the personal level)
t_{cs}	PIT rate on capital gains (statutory rate applied at realisation)
t_c	PIT rate on capital gains (effective accrual rate)
t_i	PIT rate on interest

*CIT=corporate income tax, PIT=personal income tax

a) Cost of debt finance

The simplest case to analyze is financing by borrowed funds. Assume that funds can be borrowed at a fixed market rate of r, with borrowing charges (interest expense) being tax deductible. As elaborated in Table A.D.3., the cost of capital, or pre-tax rate of return on a unit of capital required at the margin to cover financing costs and taxes, is given by:

$$\pi_B = r \qquad (D.4)$$

This result (identical to the no-tax case result) derives from the fact that interest is a deductible expense.

Table A.D.3: Derivation of the Cost of Capital for Investment Financed by Debt

Borrowed funds	1
Capital gains impacts	none
Return on invested funds:	
funds invested in productive capital	1
gross return on productive capital	π
return net of CIT	$\pi(1-u_r)$
Financing cost:	
borrowed funds	1
gross interest charge on borrowed funds	r
net interest cost of borrowed funds	$r(1-u_r)$
Equilibrium condition	$\pi(1-u_r)=r(1-u_r)$
Cost of Capital (financing by debt)	$\pi_B = r$

The cost of capital expression for debt finance, equating the pre-tax rate of return on productive capital with the interest rate on bonds, reflects a capital market equilibrium where the corporate tax burden is on infra-marginal investment alone (and not on the return to investment at the margin where rents are exhausted). For capital stocks less than the equilibrium level, the pre-tax rate of return on capital exceeds the financing cost (interest rate) and economic profits are earned and taxed. However, at the equilibrium capital stock level, returns from a debt-financed project just cover the interest costs, implying zero economic profit.

b) Cost of capital financed by new equity

In deriving the cost of capital for corporate investment financed by new share issue, the shareholder is assumed to compare his/her net return from injecting an additional unit of new equity capital in the firm to finance the purchase of additional productive capital, with the net return from investing that currency unit in an investment of equivalent risk, taken to be bonds paying a rate of return r. A distinguishing feature of new equity capital is that it is external to the firm, unlike (internal) retained earnings, with the implication that dividend tax can be avoided (when investing the funds in bonds).

Return on newly invested funds

With one unit of new equity capital invested in productive assets of the firm, the net return in the hands of the shareholder, after corporate and distributions tax, is measured by:

$$\pi(1-u_d)(1-t_{dp}) \qquad \text{(D.5)}$$

Opportunity cost

Investment in the firm of 1 unit of new equity capital (given up by the shareholder) has an after-tax opportunity cost equal to the after-tax return on the alternative investment in bonds paying r taxed at the personal rate t_i:

$$r(1-t_i) \qquad \text{(D.6)}$$

Equilibrium condition (giving cost of capital)

Thus in the case of financing by new equity, the cost of capital (*i.e.* the required marginal pre-tax rate of return on productive capital) is determined by the following condition equating net returns on new shares and bonds:

$$\pi(1-u_d)(1-t_{dp})=r(1-t_i) \qquad \text{(D.7a)}$$

Solving for the pre-tax required rate of return in the case of new equity (NE) gives the following (see also Table 3.1):

$$\pi_{NE} = r(1-t_i)/(1-t_{dp})(1-u_d) \qquad \text{(D.7b)}$$

Unlike the case of debt finance, with new equity finance the cost of capital is distorted by the tax system absent integration relief. Consider, for example, a classical tax system where dividends and interest are taxed at the same personal tax rate ($t_{dp}=t_i$). In this case, π_{NE} is given by:

$$\pi_{NE1} = r/(1-u_d) \text{ (classical system with } t_{dp}=t_i) \qquad \text{(D.8)}$$

The required pre-tax rate of return on capital equals the market interest rate r grossed-up by $(1-u_d)$, reflecting the fact that returns on equity (unlike returns on debt) are not tax deductible and are thus subject to double taxation.

Table A.D.4: Derivation of the Cost of Capital for Investment Financed by New Share Issue

New equity capital	1
Capital gains impacts	none
Return on reinvested funds:	
invested funds	1
gross return on invested funds	π
return net of CIT	$\pi(1-u_d)$
return net of PIT on distribution to shareholder	$\pi(1-u_d)(1-t_{dp})$
Financing (opportunity) cost:	
funds foregone with equity injection	1
foregone return (opportunity cost)	$r(1-t_i)$
Equilibrium (arbitrage) condition	$\pi(1-u_d)(1-t_{dp})=r(1-t_i)$
Cost of Capital (financed by NE)	$\pi_{NE} = r(1-t_i)/(1-t_{dp})(1-u_d)$

In a number of countries, the effective personal tax rate on dividend income is below that on interest income. Such is the case in imputation systems that provide partial or full integration of corporate and personal tax on distributed income. Similarly, in partial inclusion systems, the effective tax rate on dividend income is less than that on interest (owing to partial rather than full inclusion of dividend income in the personal tax base). From equation (D.7b), the cost of capital is less than $r/(1-u_d)$ where the effective tax rate on dividends t_{dp} is below the rate t_i on interest. Partial inclusion of dividend income in the personal tax base, for example, would lower the cost of capital below $r/(1-u_d)$. The greater the degree of relief from dividend taxation for the marginal shareholder, the closer is the cost of capital to the market interest rate r (greater neutrality).

As a limiting case, consider the cost of capital expression for new share issues where the tax system offers full integration of personal and corporate taxation on distributed income. In this case, the effective personal tax rate on dividend income is given by:

$$t_{dp}=(t_i-u_d)/(1-u_d) \qquad \text{(D.9a)}$$

so that

$$(1-t_{dp})=(1-t_i)/(1-u_d) \qquad \text{(D.9b)}$$

Substituting this result into the general formula given by (D.7b) gives the following result for the cost of capital with new equity finance with full integration for distributed income:

$$\pi_{NE2} = r \quad \text{(full integration with } t_{dp}=(t_i-u_d)/(1-u_d)) \qquad \text{(D.10)}$$

The result given by (D.10) shows that with full integration of corporate and personal tax on dividend income, the cost of capital for investment financed by new share issue would not be distorted by the tax system, as the return on physical is effectively subject to tax at the same (single) tax rate, the shareholder's personal tax rate t_i, as applies to interest income.[4]

c) Cost of capital financed by retained earnings

In deriving the cost of capital for corporate investment financed by retained earnings, the shareholder is assumed to compare the net rate of return earned if a unit of after-corporate tax profit is reinvested in the firm, generating capital gains subject to tax, with after-tax profits subsequently distributed, versus the alternative of immediately distributing the unit of after-corporate tax profit to be investment in bonds. A key assumption is that dividend tax cannot be avoided on funds internal to the firm.

To derive the cost of capital in the case where retained earnings are the marginal source of finance, it is necessary to establish the theoretical impact on the market value of the firm resulting from the retention (rather than the distribution) of profit.

Capital gain effects

Under the tax capitalisation model, the retention of 1 currency unit of after-corporate tax profit[5] must generate a future stream of dividends at the margin that, when capitalised and adjusted for personal tax rates relevant to the marginal investor, increases the market value of the firm by $\Delta V=(1-t_{dp})/(1-t_c)$.

Ignoring capital gains tax, the retention of a unit of after-tax profit increases the market value of a firm by $(1-t_{dp})$ units, under the assumption that the (only) alternative use of the funds is their distribution which would leave $(1-t_{dp})$ units in the hands of shareholders.

The increase in market value of shares (or capital gain) tied to retention attracts capital gains tax. Under the tax capitalisation model, investment returns must generate an expected future stream of returns sufficient to cover not only foregone dividends, but also the capital gains tax burden. Hence, the required capital gain on the retention of funds is given by $\Delta V=(1-t_{dp})/(1-t_c)$. With this result, the capital gain net of capital gains tax is $\Delta V(1-t_c)=(1-t_{dp})$, equal to the foregone after-tax dividend.

Return on reinvested funds

Consider 1 unit of after-tax profit that is retained rather than distributed. The corresponding pre-corporate tax amount is $1/(1-u_d)$, while the corresponding after-corporate tax amount of retained funds is $(1-u_r)/(1-u_d)$. With reinvested funds generating a pre-corporate tax rate of return of π, the pre-tax return is measured by $\pi(1-u_r)/(1-u_d)$.

To compare returns on reinvestment with returns under the alternative investment opportunity, it is necessarily to compare the returns 'in the hands' of the marginal shareholder. Therefore, the pre-tax return $\pi(1-u_r)/(1-u_d)$ is subject to corporate tax at the rate applicable to a distribution, at rate u_d, implying an after-corporate return and dividend distribution equal to $\pi(1-u_r)$. The return in the hands of the shareholder, net of personal (dividend) tax, is therefore given by the following:

$$\pi(1-u_r)(1-t_{dp}) \qquad \text{(D.11)}$$

Opportunity cost

The reinvestment of after-corporate tax earnings carries an opportunity cost. The opportunity cost is determined by the total amount of funds given up by the shareholder, multiplied by the rate of return on an alternative investment of equivalent risk.

Total funds given up by the investor, upon the retention of 1 unit of profit net of corporate tax, consist of the dividend foregone, in the amount $(1-t_{dp})$, plus the capital gains tax burden on the retention, equal to $t_c\Delta V=t_c(1-t_{dp})/(1-t_c)$. Thus total funds foregone equal:

$$(1-t_{dp}) + t_c(1-t_{dp})/(1-t_c) = (1-t_{dp})/(1-t_c) \qquad \text{(D.12)}$$

With the alternative use of funds taken to be an investment in bonds paying interest at rate r, and the interest income taxed at the personal rate t_i, the opportunity cost of reinvesting 1 unit of after-CIT profit is:

$$r(1-t_i)(1-t_{dp})/(1-t_c) \qquad \text{(D.13)}$$

Equilibrium condition (giving cost of capital)

Thus in the case of financing by retained earnings, the cost of capital is determined by the following condition equating the net return from retention (D.11) with the corresponding opportunity cost (D.13):

$$\pi(1-u_r)(1-t_{dp})=r(1-t_i)(1-t_{dp})/(1-t_c) \qquad \text{(D.14a)}$$

Rearranging terms gives the following (see Table A.D.5 as well as Table D.6 which derives the cost of capital expression for retained earnings under different unit choices):

$$\pi_{RE} = r(1-t_i)/(1-t_c)(1-u_r) \qquad \text{(D.14b)}$$

This result shows the pre-tax required rate of return on investment financed at the margin by retentions may be distorted by the tax system, depending on corporate and shareholder tax rates – including in this case the capital gains tax rate t_c.

Table A.D.5: Derivation of the Cost of Capital for Investment Financed by Retained Earnings*

Retained earnings (after-CIT)	1
- profit gross of CIT	$1/(1-u_d)$
- profit net of CIT on distribution (*)	1
- profit net of PIT on distribution	$(1-t_{dp})$
- profit net of CIT on retention (**)	$(1-u_r)/(1-u_d)$
Capital gains impacts	
capital gain on retention (rather than distribution) of 1 unit of profit net of CIT (net of CIT on distribution)	$\Delta V=(1-t_{dp})/(1-t_c)$
capital gain on retention of profit amount (*)	$(1-t_{dp})/(1-t_c)$
capital gains tax on retention	$t_c(1-t_{dp})/(1-t_c)$
Return on reinvested funds	
retained profit, net of CIT on retention (**)	$(1-u_r)/(1-u_d)$
return on reinvested funds, gross of CIT	$\pi(1-u_r)/(1-u_d)$
return on reinvested funds, net of CIT on distribution of funds to shareholder	$\pi(1-u_r)$
return on reinvested funds, net of PIT on distribution of funds to shareholder	$\pi(1-u_r)(1-t_{dp})$
Financing (opportunity) cost	
funds foregone under retention option (foregone dividend plus capital gains tax)	$(1-t_{dp})+t_c(1-t_{dp})/(1-t_c)=(1-t_{dp})/(1-t_c)$
foregone return (opportunity cost)	$r(1-t_i)(1-t_{dp})/(1-t_c)$
Equilibrium (arbitrage) condition	$\pi(1-u_r)(1-t_{dp})=r(1-t_i)(1-t_{dp})/(1-t_c)$
Cost of Capital (financed by RE)	$\pi_{RE} = r(1-t_i)/(1-t_c)(1-u_r)$

* See also Table A.D.6 which derives the cost of capital under alternative unit choices.

It is interesting that in the tax capitalization model, the user cost of capital is independent of the dividend tax rate t_{dp}. The reason, illustrated in Table D.5 (and Table D.6 under alternative approaches), is that dividend tax is unavoidable, as modeled, incurred on distributions of returns on reinvestment, and also under the alternative option where profits are distributed to be invested outside the firm. While the timing of the distribution tax differs between the two cases, the net effect of the distributions tax is shown to cancel out.

In examining the above result, consider first classical tax treatment where capital gains are taxed in full as they accrue as ordinary income (*i.e.* subject to tax at the same effective rate as interest income). In this case, the cost of capital with retained earnings financing at the margin is given by the following:

$$\pi_{RE1} = r/(1-u_r) \quad \text{(classical taxation with } t_c=t_i) \tag{D.15}$$

This rate is similar to that derived for the cost of capital under new equity financing with classical tax treatment of distributed income.[6] The rate is similar as in both cases profits are subject to double taxation, first at the corporate and then at the personal level, in this example on an accrual basis at the shareholder's basic personal tax rate t_i.

In practice, most countries tax capital gains on a realization rather than accrual basis. If we let t_{cs} denote the statutory capital gains tax rate applicable at the time of realization – equal to the personal tax rate on interest income, or possibly some other tax rate – the accrual-equivalent tax rate applicable to current accrued gains is given by:[7]

$$t_c=t_{cs}/\lambda^{(h-1)} \quad \text{where } \lambda=1+r(1-t_i) \tag{D.16}$$

where h denotes the holding period of shares. In the limit, as h extends to infinity, the accrual-equivalent tax rate approaches zero (t_c tends to 0). From the general formula for π_{RE} given by (D.14b), if the effective capital gains tax rate is zero (either with taxation but indefinite deferral, or a capital gains tax exemption), the cost of capital for marginal investment financed by retentions is given by:[8]

$$\pi_{RE2} = r(1-t_i)/(1-u_r) \text{ (indefinite deferral or capital gains exemption, with } t_c=0) \tag{D.17}$$

Several observations can be made if deferred (realization) taxation renders the effective tax rate on capital gains to be negligible. First, the cost of capital for retentions finance would be less than that for new equity capital if dividends are subject to classical tax treatment and taxed at the same rate as interest income ($\pi_{NE1}=r/(1-u_d)$). With dividends subject to double taxation and retentions effectively taxed only at the corporate rate, new equity finance would be discouraged relative to retained earnings and debt finance.

Second, if the taxation of distributed income is fully integrated, then the cost of capital for retentions would equal that for new share capital and debt finance provided that the corporate tax rate on retentions equals that the personal tax rate on interest income. In this case, full financing neutrality is observed):

$$\pi_{RE3} = r(\text{with } t_c=0 \text{ and } t_i=u_r) \tag{D.18}$$

This result is intuitive. If the effective capital gains tax rate is zero, implying single taxation of retained profit at the corporate level, then neutrality would require that the corporate tax rate imposed on retained profit equal the tax rate on interest (on the alternative investment) imposed at the personal level alone. If this is the case, then the

financing choice between retentions, debt finance, and new share issue would be neutral if full imputation relief is provided in respect of distributed profit, with the cost of capital for each source of funds equal to the market interest rate ($\pi_B=\pi_{NE}=\pi_{RE}=r$), as observed in the no-tax case.[9] If, however, the corporate tax rate on retentions is less than the basic personal tax rate, as it is in many tax systems, then tax deferral on gains can lower the cost of capital for retentions below the market interest rate.

In the early literature addressing possible tax distortions to corporate financial policy, a distinction was drawn between debt and equity, and in particular debt and new equity (rather than retentions). With the 'old' view operating on the assumption that equity finance was by way of new share issue, distorting effects of dividend taxation were highlighted, while the possible distorting effects of capital gains taxation on financial policy were not.[10]

The cost of capital for (newly injected) equity was derived under the assumption, as used above, that shareholders compare dividend returns on new shares with interest returns on bonds, and demand a pre-tax rate of return on equity capital equal to the following $\pi = r(1-t_i)/(1-t_{dp})(1-u_d)$, as shown by equation (D.7b). In the classical tax system case, which was widely observed in the 1960s and 1970s, where the effective personal tax rates on dividend income and interest income are the same, the cost of capital expression reduces to $\pi = r/(1-u_d)$ as shown by (D.8)

Under this specification (financing by new share issue, with $t_{dp}=t_i$), the cost of capital or required pre-tax rate of return on capital is more than 40% higher than that on bonds where the corporate tax rate is 30%, for example, and even higher where the corporate tax rate is larger, suggesting significant economic distortions. Double taxation of corporate income, first at the corporate level and again at the shareholder level, would be expected to reduce corporate investment, at least in the closed economy case, and to lead to an excessive amount of capital in the unincorporated sector (where investment returns are subject to tax once at personal rates) relative to the corporate sector.

In contrast to the 'old' view, the 'new' view recognizes that most equity capital is generated internally. Indeed, in most countries, retained earnings form the bulk of equity finance, and are often the marginal source of funds, particularly for 'mature' firms.[11] When admitting retained earnings as a source of finance, the user cost of capital expression was derived as $\pi_{RE} = r(1-t_i)/(1-t_c)(1-u_r)$. The implied tax distortions may be considerably less than those implied by $\pi_{RE} = r/(1-u_d)$ if the personal tax rate on interest income equals or exceeds the corporate tax rate on retentions and the accrual-equivalent capital gains tax rate is well below the statutory rate due to deferral. Neutrality may even be observed where the corporate rate, and effective capital gains tax rate, combine such that the terms $(1-t_c)(1-u_r)$ roughly equal $(1-t_i)$.

At roughly the same time as the new view being initially debated, a number of countries were introducing or already had introduced domestic measures to integrate corporate and personal taxation of distributed income. As noted above, full integration of dividend income ensures neutrality as between debt and new share capital where the marginal shareholder is eligible for the tax relief and shareholder level tax considerations factor into the cost of capital in the way predicted by the tax capitalization model. Thus, one would likely observe today fewer economic distortions than that implied by the old view.[12] However, this would need to be confirmed with reference to country-specific tax rates and practices, and as noted at the outset, with reference to some convincing evidence on the import of shareholder level taxes in cost of capital measures.

Table A.D.6: Alternative Derivations of the Cost of Capital for Investment Financed by Retained Earnings

	Modelling approach 1	*Modelling approach 2*	*Modelling approach 3*	*Modelling approach 4*
Retained earnings (after-CIT)	$(1-u_d)$	1	$1/(1-t_{dp})$	$(1-t_c)/(1-t_{dp})$
- profit gross of CIT	1	$1/(1-u_d)$	$1/(1-u_d)(1-t_{dp})$	$(1-t_c)/(1-u_d)(1-t_{dp})$
- profit net of CIT on retention	$(1-u_r)$	$(1-u_r)/(1-u_d)$	$(1-u_r)/(1-u_d)(1-t_{dp})$	$(1-t_c)(1-u_r)/(1-u_d)(1-t_{dp})$
- profit net of CIT on distribution (*)	$(1-u_d)$	1	$1/(1-t_{dp})$	$(1-t_c)/(1-t_{dp})$
- profit net of PIT on distribution	$(1-u_d)(1-t_{dp})$	$(1-t_{dp})$	1	$(1-t_c)$ (Sinn's illustration)
Capital gains impacts				
capital gain on retention (rather than distribution) of 1 unit of profit net of CIT (net of CIT on distribution)	$\Delta V^*=(1-t_{dp})/(1-t_c)$	$\Delta V^*=(1-t_{dp})/(1-t_c)$	$\Delta V^*=(1-t_{dp})/(1-t_c)$	$\Delta V^*=(1-t_{dp})/(1-t_c)$
capital gain on retention (rather than distribution) of profit amount (*)	$(1-u_d)(1-t_{dp})/(1-t_c)$	$(1-t_{dp})/(1-t_c)$	$((1-t_{dp})/(1-t_c))(1/(1-t_{dp}))=1/(1-t_c)$	$((1-t_{dp})/(1-t_c))((1-t_c)/(1-t_{dp}))=1$
capital gains tax on retention	$t_c(1-u_d)(1-t_{dp})/(1-t_c)$	$t_c(1-t_{dp})/(1-t_c)$	$t_c/(1-t_c)$	t_c
Return on reinvested funds				
retained profit, net of CIT on retention	$(1-u_r)$	$(1-u_r)/(1-u_d)$	$(1-u_r)/(1-u_d)(1-t_{dp})$	$(1-t_c)(1-u_r)/(1-u_d)(1-t_{dp})$
return on reinvested funds, gross of CIT	$\pi(1-u_r)$	$\pi(1-u_r)/(1-u_d)$	$\pi(1-u_r)/(1-u_d)(1-t_{dp})$	$\pi(1-t_c)(1-u_r)/(1-u_d)(1-t_{dp})$
return on reinvested funds, net of CIT on distribution of funds to shareholder	$\pi(1-u_r)(1-u_d)$	$\pi(1-u_r)$	$\pi(1-u_r)/(1-u_d)(1-t_{dp}))(1-t_d)$ $=\pi(1-u_r)/(1-t_{dp})$	$\pi((1-t_c)(1-u_r)/(1-u_d)(1-t_{dp}))(1-u_d)$ $=\pi(1-t_c)(1-u_r)/(1-t_{dp})$
return on reinvested funds, net of PIT on distribution of funds to shareholder	$\pi(1-u_r)(1-u_d)(1-t_{dp})$	$\pi(1-u_r)(1-t_{dp})$	$\pi(1-u_r)(1-t_{dp})/(1-t_{dp})$ $=\pi(1-u_r)$	$\pi(1-t_c)(1-u_r)(1-t_{dp})/(1-t_{dp})$ $=\pi(1-t_c)(1-u_r)$
Financing (opportunity) cost				
funds foregone under retention option (foregone dividend plus capital gains tax)	$(1-u_d)(1-t_{dp})+t_c(1-u_d)(1-t_{dp})/(1-t_c)$ $=(1-u_d)(1-t_{dp})/(1-t_c)$	$(1-t_{dp})+t_c(1-t_{dp})/(1-t_c)$ $=(1-t_{dp})/(1-t_c)$	$1+t_c/(1-t_c)=1/(1-t_c)$	$(1-t_c)+t_c=1$
foregone return (opportunity cost)	$r(1-t_i)(1-u_d)(1-t_{dp})/(1-t_c)$	$r(1-t_i)(1-t_{dp})/(1-t_c)$	$r(1-t_i)/(1-t_c)$	$r(1-t_i)$
Equilibrium (arbitrage) condition	$\pi(1-u_r)(1-u_d)(1-t_{dp})$ $=r(1-t_i)(1-u_d)(1-t_{dp})/(1-t_c)$	$\pi(1-u_r)(1-t_{dp})$ $=r(1-t_i)(1-t_{dp})/(1-t_c)$	$\pi(1-u_r)=r(1-t_i)/(1-t_c)$	$\pi(1-t_c)(1-u_r)=r(1-t_i)$
Cost of Capital (financed by RE)	$\pi=r(1-t_i)/(1-t_c)(1-u_r)$	$\pi=r(1-t_i)/(1-t_c)(1-u_r)$	$\pi=r(1-t_i)/(1-t_c)(1-u_r)$	$\pi=r(1-t_i)/(1-t_c)(1-u_r)$

Notes

1 For simplicity, the analysis assumes that productive capital does not depreciate (implying that the real (physical) return on a unit of installed capital is constant over time) and ignores corporate tax incentives for investment (e.g. investment tax credits). This treatment does not alter the conclusions drawn from the model in respect of possible tax distortions to corporate financial policy dependent on shareholder taxation of interest, dividends and capital gains. In a more general model that admits capital depreciation, the cost of capital measure shows the marginal pre-tax real rate of return that must be earned to cover financing, depreciation and tax-related costs.

2 However, capital gains/losses on corporate shares arise not only on account of profit retentions/losses, but also with inflation, variations in market interest (investor discount) rates, and changes in investors' expectations over other key variables and factors influencing corporate cash flow including productivity changes. These considerations may also influence the relative setting of capital gains tax rates.

3 The analysis allows the CIT rate on distributed profit to differ from that on retentions. This allows one to consider the split-rate model (e.g. as previously employed in Germany) and other models where some degree of integration relief is provided at the corporate level (so that the effective tax rate at the corporate level on distributions is less than that on retentions).

4 Where integration relief is provided at rate α, with $0<\alpha\leq 1$, the effective tax rate on dividend income is $t_{dp}=(t_i-\alpha u_d)/(1-u_d)$. In this case, $(1-t_{dp})=(1-t_i-(1-\alpha)u_d)/(1-u_d)$, so that $\pi=r(1-t_i)/(1-t_i-(1-\alpha)u_d)$. Note that if $\alpha=1$, $\pi=r$. Where $\alpha<1$, $\pi>r$.

5 Where the CIT rate on distributed profit u_d differs from the CIT rate on retained profit u_r (as it would under a split rate system, or a system providing integration relief at the corporate level) the relevant corporate tax rate is the CIT rate on distributed profit u_d.

6 The difference in results (D.8) and (D.15) rests on the fact that the CIT rate on retentions u_r relevant to the retentions financing case may differ from the CIT rate on distributions u_d for the new share issue financing case. Note that the cost of capital would be lower in the new share issue case where u_r exceeds u_d, as under a system that relieves double taxation of distributed income through a corporate level partial deduction.

7 In systems that tax (net) taxable capital gains (in full) as ordinary income, $t_{cs}=t_i$. In systems that provide for partial inclusion of capital gains, $t_{cs}<t_i$.

8 This rate is similar to that for new shares in the special case where dividend income is not subject to personal tax ($t_{dp}=0$), with differences arising where $u_d\neq u_r$.

9 In other words, we have the result $\pi_B=\pi_{NE}=\pi_{RE}=r$ if personal tax rates on investment income satisfy the following: $t_i=u_r$, $t_{dp}=(t_i-u_d)/(1-u_d))$ and $t_c=0$

10 The 'old' view is associated with Harberger (1962) and McLure (1979).

11 The 'new' view is associated with King (1974, 1977), Bradford (1980, 1981), Auerbach (1979, 1983), Fullerton and King (1984), Edwards and Keen (1984), and Sinn (1987, 1991).

12 A number of countries have recently moved away from systems providing imputation tax credits. However, where these are replaced with alternative systems providing full or partial integration relief (*e.g.* through partial inclusion rates at the shareholder level), these relieving measures would imply an effective dividend tax rate t_{dp} below the personal tax rate on interest income t_i.

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OECD Tax Policy Studies

Taxation of Capital Gains of Individuals

POLICY CONSIDERATIONS AND APPROACHES

This report investigates policy considerations in the taxation of capital gains of individuals and design features of capital gains tax systems. Perspectives on these are reported for 20 OECD countries. Descriptive information on aspects of capital tax rules for gains on domestic assets of resident investors are presented in summary tables covering all OECD countries.

Insights of policy makers are provided for policy considerations highlighted as central to decision-making over the tax treatment of capital gains of individuals, including tax revenue concerns and possible "lock-in" effects. Also reviewed are policy-makers' assessments of possible influences of capital gains taxation on risk-taking by individuals, and on financing and profit distribution policies of firms. A number of design considerations are addressed, with information provided on certain main provisions of capital gains tax systems.

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