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**DUAL INCOME TAX**



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# Dual Income Tax

## The Dual Income Tax System – An Overview

Robin Boadway*

OECD countries rely to varying degrees on personal income taxes to raise revenues in a fair and efficient way. Yet, despite the many differences in policy and institutional settings, their income tax systems share some common features. Tax policy specialists agree on the problems that these features give rise to, but there is no consensus on the appropriate reforms that should be undertaken. Moreover, the record of major reforms is decidedly mixed. Commissions in many countries have presented proposals for far-reaching reform of the personal tax system – an example being the adoption of a personal consumption tax system – but these have been rarely adopted in practice. A notable exception is the dual ("Nordic") income tax system, which as an explicitly schedular system represents a significant departure from the commonly used principle of comprehensive income taxation.[1] To put the tax system in perspective, it is useful first to review the basic features of income tax systems that are based on the comprehensive principle and to outline the difficulties. This will serve as a basis for presenting the main features of the Nordic system, which is largely motivated by addressing the problems of comprehensive income taxation and its oft-proposed counterpart, personal consumption taxation.

### Comprehensive income as the basis for taxation

Most countries' tax systems pay at least lip service to the principle of comprehensive income taxation. They define a single measure of taxable income from all sources, and then apply a single rate schedule. However, some fundamental administrative and economic problems preclude the full application of the comprehensive income principle. Consider each in turn

*Administrative problems*

A pure comprehensive income tax system is difficult, if not impossible, to implement. Some elements of comprehensive income are hard for households to measure let alone for tax authorities to verify. Examples include the following: imputed income from assets of various sorts, such as housing and other consumer durables, and insurance policies; accrued capital gains on financial and personal assets; the return on human capital accumulated (as opposed to endowed); the return on personal business investments; real versus nominal returns on financial assets; the value of the non-market use of time for leisure or household production; and gifts and inheritances received, possibly net of those given.

The fact that actual income tax systems inevitably end up excluding some sorts of income and taxing others preferentially (e.g., capital gains) leaves arbitrage – or evasion – opportunities to households, and these undermine the integrity of the tax system. Moreover, under a progressive income tax system, horizontal equity problems can arise if it is difficult to implement an effective income averaging system: income fluctuations per se increase one's tax liability. The consequence of these administrative problems is that income tax systems cannot replicate the comprehensive income tax ideal.

*Economic Problems*

A comprehensive income tax system treats all sources of income the same. Yet, standard public finance principles suggest that there should generally be differential treatment of different sources (and uses) of income. The broadest distinction of sources of income is between labor income and

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[1] Comprehensive reviews of the Nordic tax system and its effects may be found in Sørensen (1994), Nielsen and Sørensen (1997) and Sørensen (1998).

capital income, or equivalently on the uses side between present consumption and future consumption. A tax on labor and capital income combined is roughly equivalent to a system that taxes future consumption more heavily than present consumption. The reason is that saving out of current income is double-taxed: once when the income is earned and again when the return on that saving is earned. On efficiency grounds, it is hard to justify such a system. On the contrary, a reasonable case can be made for taxing present and future consumption at the same rate, which in simple terms can be achieved by zero taxation of capital income to eliminate the double taxation. Such a result requires particular assumptions about the form of intertemporal preferences, especially involving the separability of consumption decisions from labor-leisure choices over time. Even if these assumptions are not satisfied, there is no general presumption about which way they will be violated, that is, whether the efficient tax on capital income should be positive or negative. The principle of insufficient reason suggests zero capital income taxation on these grounds. In any case, there would be little justification for taxing capital income at the same rate as labor income.

Similar considerations apply on equity grounds. If the government were perfectly informed, it would want to base its redistributive taxation on exogenously given wealth of households – their endowed human wealth (native ability) and endowed asset wealth. The inability to observe these endowments implies that some imperfect indicator of wealth must be used as a tax base. Labor income would be a good index of native ability if labor supply were fixed and there was no human capital investment, and capital income would be a good index of inherited wealth if households kept the stock of their inherited wealth intact. But even in this ideal case, one may not want to tax labor and capital income at the same rate: a common progressive tax on all inherited wealth would generally entail a different rate of tax on labor and capital income. In fact, labor income reflects variable effort as well as the return on investment in human capital, and capital income includes the return on life-cycle savings, so the optimal relation between labor and capital income taxation becomes a complicated second-best problem. If inherited asset wealth is dealt with by an inheritance tax, there is presumption for preferential taxation of capital income: the same separability conditions that entail zero capital taxation on efficiency grounds will also lead to zero capital income taxation on equity grounds. To the extent that inheritances could not be taxed, the case for taxing capital income would be enhanced.

Other arguments can be mobilized for providing preferential treatment of capital income. To the extent that saving is for retirement (life-cycle smoothing), a case can be made for sheltering capital income from taxation. For one thing, households may undersave for their retirement either because of myopia or because they anticipate transfers inversely related to their wealth in retirement. As well, lifetime averaging arguments might suggest some sheltering of saving for retirement, in the absence of general averaging provision in the tax system. Also, capital income might be much more mobile internationally than labor income, in which case national governments may prefer to treat it preferentially. And, along the same lines, it may be easier to evade.

**Personal consumption taxation**

One option for avoiding many of these problems is to adopt a personal consumption tax system by eliminating the taxation of capital income altogether. The latter can be achieved by treating assets on either a designated or a tax-prepaid basis, allowing households the discretion to choose subject to the fact that for some assets one type of treatment may be more suitable than another. Designated treatment involves deducting savings from income, and including the principal and accumulated returns in the tax base when they are consumed. This is suitable for household business assets and human capital accumulation. Tax-prepaid treatment simply involves excluding capital income from the tax base, and is suitable for assets whose returns are difficult to measure (e.g. housing).

Consumption taxation avoids most of the administrative problems of comprehensive income taxation, a major exception being taxing the use of non-market time. It essentially leaves capital income out of the tax base thereby avoiding the preferential treatment of present versus future consumption. However, it has its own problems. Even though it may not be desirable to tax capital income at the same rate as labor income, by the same token, it may not be desirable to exclude it altogether. Thus, given the inability to tax leisure

or household production, it would be desirable on both efficiency and equity grounds to impose a tax on capital income to the extent that future consumption and non-market labor are complementary, which might be a reasonable presumption. As well, a personal consumption tax is to a large extent equivalent to a tax on labor income, and as such inherited wealth is not taxed. A case can be made for taxing capital income as a presumptive way of taxing inheritances and gifts. Of course, to the extent that a personal consumption tax can be supplemented by a tax on inheritances, this problem is avoided, although there is then the further issue of whether the tax should be on gross or net inheritances.

Finally, there may be political economy arguments leading to capital income taxation. Even fully rational and benevolent governments might tax capital income for time consistency reasons. At any time there is a stock of wealth that has already been accumulated, and it will be perfectly rational for governments that cannot commit to future tax rates in advance to impose relatively high tax rates on capital income. As well, public choice principles suggest that the political system leads to the taxation of capital income as a way of redistributing to voters in the majority. Since these arguments for taxing capital income typically conflict with optimal taxation principles, it might be argued that putting in place a tax structure that constrains the ability of the government to tax capital income – such as a consumption tax system – might lead to less capital income taxation.

**Compromise tax systems**

The combination of the problems with a comprehensive income tax, which taxes all sources of income on a par, and a consumption tax system, which avoids taxing capital income altogether, leads one to a compromise system in which capital income is taxed less than labor income, but is nonetheless taxed. As we have seen, economic theory offers little concrete advice about the appropriate extent of differential taxation. Here we simply take as given the case for some preferential treatment of capital income, and consider the issues that arise in designing such a system.

First, it should be noted that even in countries where the comprehensive income tax principle is respected, capital and labor income are already treated differently. The overall tax structure includes a mix of taxes of which personal taxation is only one component. Other major components include general sales and payroll taxes, which are effectively equivalent to proportional consumption taxes (the sales tax treating assets as designated and the payroll tax treating them on a tax-prepaid basis). Thus, the combination of income, sales and payroll taxes provides preferential treatment to capital income. There are some other forms of taxation that partly undo this favorable treatment of capital income, such as property taxes, which especially affect housing, and various forms of taxes on business income, which affect owners of shares in businesses to the extent that integration with the personal tax does not offset it. However, the typical tax mix does not treat asset income in a systematic way. As noted above, income taxes tend to provide favorable tax treatment to certain types of assets to the exclusion of others, leading to inefficiencies and inequities as well as to compliance and enforcement problems.

These features of existing tax systems highlight some issues that arise in designing a tax system intended to provide preferential treatment to capital income. One is the question of the comprehensiveness of the capital income component of the tax base. On broad economic efficiency and equity grounds, one might think that income from assets of all sorts should be included on an equivalent basis. However, two considerations militate against that. First, it may still be desirable to encourage saving for retirement for reasons mentioned earlier. There may also be social reasons for providing preferential tax treatment to owner-occupied housing and perhaps to personal businesses. Second, the administrative difficulties of taxing (real) asset incomes remain: some forms of asset income are difficult to measure on an imputed or accrued basis and to index to inflation. Potentially these problems could be addressed as they are in existing hybrid income tax systems, that is, by providing preferential treatment to certain types of assets. Of course, once this is done, households will have an incentive to hold assets in a tax-sheltered form, whether that is the intention of the preferential treatment or not.

Another question concerns the rate structure. Given that different tax rates are to apply to capital and labor income, how should tax progressivity differ between the two tax bases? The choice of a rate structure involves both value judgments about

vertical equity and economic judgments about the efficiency or incentive consequences of marginal tax rates. On purely equity grounds, one might expect progressivity to be higher the more the tax base reflects household endowments rather than rewards for discretionary actions. Progressivity of the labor income tax would be higher the less responsive are labor earnings to after-tax wages, and the greater is the differential in native abilities among the population. Responsiveness here would take into account not only variable labor supply, but also effects on occupational choice, labor market participation, migration and tax evasion. There might also be effects on human capital investment, but these are offset by the facts that human capital investment that takes the form of forgone earnings is effectively tax deductible, and resource costs of education are largely paid by the state. Similarly, the capital income tax would be more progressive the less responsive is asset accumulation to the after-tax return to saving, the more difficult it is to avoid or evade taxes, and the more unequal is asset ownership in the population. The case for progressive capital income taxation is significantly mitigated by the existence of wealth or wealth transfer taxes, such as taxes on bequests or inheritances, given that progressivity is ultimately intended to address inequalities in endowed wealth.

One further complicating factor concerns the variability of different sources of income. In the case of labor income, this variability might be predictable, as in the case of seasonal work, or it might reflect riskiness associated with uncertainty of employment or earnings. A progressive tax system discriminates against variable income and causes problems of horizontal inequity as well as adverse incentive effects. These may be mitigated by the social insurance system or potentially by income averaging for tax purposes, but it is typically difficult for workers to self-insure against uncertain incomes. In the case of capital income, variability is more likely to arise from uncertainty alone. To the extent that capital markets are efficient, much of the uncertainty of asset returns can be undone by pooling risks, but some residual uncertainty will remain, and it will differ from asset to asset. Again, a progressive tax system will discourage the demand for risky assets and will lead to horizontal inequity, but one might expect that the problem is less severe for capital income than for labor income, whose variability is especially harmful to the most vulnerable workers.

Taking all of these considerations into account, one might reasonably argue that the tax on labor income should be more progressive than the tax on capital income, especially in the presence of taxes on wealth transfers between generations and a strong social safety net for the most unfortunate workers.

Another issue that arises in a tax system that treats labor and capital income differentially is the incentive to report labor income as capital income. This is particularly a problem for unincorporated businesses where the distinction between capital and labor income is ambiguous: business owners put their own equity capital into the firm as well as providing managerial or entrepreneurial input. Owners will have an incentive to report low salaries and to overstate the profits of the firm (which themselves are difficult to impute). The problem of dealing with personal business income is one that plagues virtually every tax system, whether it is designed according to comprehensive income principles, consumption tax principles, or some combination of the two.

A related problem concerns the relation between the personal and the corporation tax systems. One of the main functions of the latter is to act as a withholding device against personal income earned within a corporation, which is otherwise difficult to tax on an accrual basis at the personal level. To achieve this, it is necessary to credit shareholders with the corporate tax that has been withheld once the funds are taken out of the corporation as dividends or realized capital gains. This can be done by the so-called imputation method, whereby credits are made available on dividends or capital gains, by an exemption method whereby dividends or realized capital gains are simply subject to a lower tax rate, or by crediting payouts at the corporate level.

In an open economy, the imputation method has an advantage in terms of being better able to restrict integration to domestic shareholders. Integration is made more difficult both by progressivity in the personal taxation of capital income and by the differential tax treatment of different types of assets. In either case, it is virtually impossible for the corporation to withhold at the correct rate for all its shareholders. The relation between the personal and corporate tax also applies to interest income. Interest income can readily be taxed at the personal level, so most corporate tax systems deduct interest payments from the tax base. But, differ-

ences in personal and corporate tax rates will influence shareholders' preferences for debt versus equity financing. Again, this problem is difficult to overcome if interest income of different persons is taxed at different rates because of progressivity or preferential treatment.

Finally, tax compliance may be more difficult with capital income than with labor income. It relies more on self-reporting (as opposed to withholding at source), and verification may be more difficult for the authorities, especially if foreign assets are held. This problem can be mitigated by requiring financial institutions – including foreign ones, by international agreement – to withhold taxes on capital income paid to creditors. This too will be administratively more difficult if different households pay different tax rates on capital income.

**The dual "Nordic" income tax system**

The Nordic tax system represents a particular approach to achieving a compromise between the taxation of capital income and labor income (or, more generally, non-capital income to the extent that it includes pensions and other forms of transfers). It is a compromise that has some attractive features from a tax administration point of view.

The Nordic system is a dual income tax system in which capital income is taxed according to a separate tax schedule than labor income. The basic features of the ideal dual income tax system – not all of which have been fully implemented in the Nordic countries – are straightforward. Two tax bases are reported, one for capital income, and one for other sources of household income. The former includes, in principle, capital income of all types from all assets, including interest, dividends and capital gains from financial assets, imputed rent on housing, accrued returns on pension savings, and profits from personal businesses. Thus, the capital income base is broader than existing hybrid income tax systems, which typically shelters some forms of capital income. Capital income is then taxed at a uniform proportional rate equivalent to the lowest marginal tax rate on other income.

The non-capital income category includes earnings as well as pensions and transfers from government. It is taxed according to a progressive rate structure, which incorporates any credits and deductions used to achieve horizontal and vertical equity. The corporation income tax rate is then set at the personal capital income tax rate and is fully integrated with the latter using the imputation or some other method.

Taken in the context of the broader tax system – which includes a general tax on consumer purchases and payroll taxes – the dual income tax system results in capital income tax rates that are significantly lower than tax rates on other income, and much less progressive. And, although it is not part of the dual income tax system, a useful complement is a tax on wealth transfers between generations, perhaps defined on a net basis.

The Nordic income tax system has a number of advantages compared with hybrid income tax systems. The taxation of all sources of asset income at a common rate avoids the inter-asset distortions while still encouraging household saving. The preferential tax treatment of capital income can be defended both on efficiency and equity grounds, especially in a context in which capital income is mobile internationally. Compliance is simplified for households, and the incentive to engage in wasteful tax planning and arbitrage are reduced. As well, the tax is simpler for revenue authorities to administer.

The absence of a progressive rate structure might be regarded as a disadvantage on equity grounds, but that is offset by some other considerations. First, if a wealth transfer tax accompanies the Nordic system, vertical equity goals can be achieved. Second, to the extent that capital income reflects life-cycle savings behavior, a proportional tax works in favor of horizontal equity since it does not discriminate against those who choose to save more. Third, a proportional rate structure avoids penalizing those who hold risky assets. Finally, given that capital income is highly mobile, the effects of a progressive rate structure can be to some extent undone by avoidance and evasion by households with large amounts of wealth. In any case, once a dual income system is in place, it would be feasible to implement a progressive rate structure for capital income.

**Some outstanding issues**

The Nordic income tax system remains an ideal, like the comprehensive income and personal consumption tax systems. An attempt to implement it

would encounter a number of issues, some of which we highlight in this final section. The first of these is the problem of measuring all elements of the capital income base. The same problems arise as in the comprehensive income base. The imputed returns from some assets are difficult to measure, including housing equity and the returns from personal business. Capital gains should in principle be included on an accrual basis, as should the returns to pension wealth. And, all capital income components – especially interest and capital gains – should be fully indexed for inflation.

Next, some types of asset income are not included even in the ideal dual tax system. One example of this is consumer durables other than housing. Another is the return to human capital accumulation. In both cases, they would effectively be treated on a consumption tax basis, so would not be taxed.

Measurement problems are less severe for labor income, but not absent. Earnings from the labor contribution to personal businesses are difficult to measure since they are indistinct from profits: both appear as the income of the business. In accounting for this source of labor income, personal business owners would have an incentive to count as much income as possible as capital income unless they are in the lowest income tax bracket. In addition to this being inequitable, it can affect the decision to incorporate. Labor income of the self-employed might also be prone to understatement.

One major advantage of the dual income tax system is the ease with which the corporate and personal taxes can be integrated. The use of a common corporate and personal tax rate on capital income facilitates this. Nonetheless, some problems can arise. If the personal tax rate on capital income is constrained to be the same as the lowest labor income tax rate, this constrains the ability of the corporate tax to respond to capital tax competition. If corporate tax rates are competed down internationally, net capital inflows would fall if the corporate tax rate could not be lowered. If the corporate tax rate were allowed to fall below the minimum labor income tax rate, the advantages of the dual income tax system would require that the personal tax on capital rate fall as well, and that might be regarded as inequitable.

Proportionality of the capital income tax schedule is also contentious. The Nordic income tax system calls for a proportional tax on capital income, whereas nothing in principle prevents a progressive tax structure being employed, even if it detracts from simplicity. The case for a progressive rate structure can be countered by a couple of factors. To the extent that a tax on inheritances is in place, the case for redistributing asset income is weakened, as we have mentioned. As well, the gain from a progressive capital tax structure on equity grounds can be relatively little. The mobility of the capital income tax base, the fact that much variability of capital income reflects life-cycle effects, and the relatively small amounts of revenue generated from increasing capital income tax rates at the upper end all suggest that the gain from progressivity may not offset the loss in simplicity. This will especially be the case if the labor income tax schedule is effective at redistributing to those who are most in need. For example, a set of fully refundable income-contingent tax credits can be highly effective at targeting transfers to those at the bottom of the income distribution even under an otherwise modestly progressive rate structure.

Finally, the dual income tax structure can have advantages in a federal context. There are sound arguments for allowing lower-level governments access to direct taxes on personal labor income jointly with the central government, while retaining capital income taxes at the center. The dual income tax makes this possible. The same argument might be extended to an economic union context where there is no autonomous central government. If all nations adopted a dual income tax, it would be possible – and desirable – for capital income taxes to be coordinated among nations, while leaving labor income taxes uncoordinated.

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# Norwegian Income Tax Reforms

Vidar Christiansen*

In few countries have modern income tax reforms been governed by overall economic principles to the same extent as in Norway. This is primarily due to the influential role of a number of government-appointed committees whose reports have set the agenda for tax reform in Norway during the last two decades. The first was the Report of the Tax Commission in 1984 (NOU 1984) that instigated a series of reform steps during the eighties. The second, and big milestone, was the Report of the Aarbakke Committee in 1989 (NOU 1989) which led to a structural overhaul of the tax system. The overall purpose was to establish a tax system based on sound economic principles that would promote an efficient allocation of capital, while at the same time limiting the distortion of capital accumulation. The resulting introduction of a new income tax system from the beginning of 1992 - to become known as the dual income tax - was seen by many in Norway as the ultimate tax reform that had finally furnished the country with a durable income tax system that would guarantee adherence to major economic principles.

This verdict may seem ill founded, or at least overly optimistic, in view of the fact that only eleven years later a third report, submitted by the Skauge Committee (NOU 2003), proposed further reform steps, partly undoing some of the elements of the previous reform. Two kinds of problems had been underestimated at the time of the Aarbakke report. One was the information and enforcement problems inherent in the system, that were to become increasingly noticeable and urgent as over time the economic agents found ways to adapt to the new system. Another was the lack of political commitment to basic principles beyond the short term. We shall return to these problems and how they have been addressed after reviewing the main features of the 1992 income tax system.

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**The 1992 reform**

Taking a quick look further back in time, we may note that Norway entered the eighties with very high statutory tax rates applied to labour as well as capital income. With full deductibility of interest expenses, while tax favours were granted to a number of assets, there was a strong concern that this asymmetry induced excessive borrowing for socially unprofitable investment. A major contribution of the Tax Commission, was to put an end to a lengthy debate on the deductibility of interest payments in Norway by proposing major cuts in marginal tax rates that contributed considerably to eliminating the harmful (dis)incentive effects on accumulation of debt and assets while still retaining full deductibility. By increasing pay roll taxes and social insurance contributions, levied only on labour income, not on capital income, a step was in fact taken towards the future introduction of a fully-fledged dual income tax differentiating taxes on capital and labour income.

Prior to 1992 there was a wide recognition in Norway that savings were low, the return to investment was low, and the investment allocation was seriously distorted. The overall objective of the 1992 reform was to achieve a moderate taxation of capital income that is neutral in a very broad sense, while maintaining the distributional role of a progressive tax on labour income (see also Sørensen 1994). A linear capital income tax with a tax rate of 28 per cent was introduced. The ideal was that no tax favours should be granted to specific types of investment, certain organisational forms, or particular sources of finance. Marginal tax cuts were combined with base broadening and the elimination of a variety of opportunities for firms to make use of deductions and tax-favoured funds, often to defer tax payments more or less indefinitely. Efforts were

made to reconcile depreciation allowances with true economic depreciation. The principles laid down by the Aarbakke committee had far-reaching implications for practical tax policy.

Derived from the desirability of neutrality and symmetry in the taxation of capital, the ideal was single taxation of all kinds of capital income at a uniform rate, also applied to negative income such as mortgage interest expenses. To avoid discrimination of corporate income and hence corporate investment it was considered crucial to have no double taxation of profits accruing to shareholders either as dividends or capital gains. Two innovations were essential for this purpose. An imputation system was devised to ensure single taxation. Once profits have been taxed at the corporate level the shareholder is granted full credit against the personal tax on dividends. A further innovation was required to extend single taxation to capital gains that should not be taxed to the extent that they reflect retentions of already-taxed earnings. There was a need to separate the latter from capital gains due to exogenous and random events. The method, called RISK (a Norwegian acronym), implies that the tax value of shares is adjusted for profit retentions. By stepping up the value basis a smaller taxable gain will materialise at the time of realisation. The commitment to single taxation is ambitious, and the RISK scheme has proved administratively costly.

As we have seen, a key premise of the reform was that capital income should be taxed differently and on the whole by a lower marginal tax rate than labour income. It is interesting to observe how the motivation for a lower capital income tax has shifted over time. While the first reforms to that end were justified mainly by the concern with excessive borrowing, the motivation gradually shifted towards the concern with international mobility of capital - an argument virtually non-existent in the early eighties. A particular aspect, often drawn attention to at a time when the inflation rate was much higher than today, was the confiscatory real effect of nominal taxation driving the nominal after-tax interest rate below the inflation rate. Even if the intention of the 1992 reform was to achieve uniform and neutral taxation of all kinds of capital income, realistic, experience-based expectations were probably that in practice certain investments would remain tax favoured. A way to limit the resulting distortion is then to tax ordinary, non-preferential investments relatively mildly, which is a further low-tax argument (see also Nielsen and Sørensen 1997).

Obviously differential taxation of labour and capital makes it necessary to distinguish labour and capital income in practice – in itself a daunting task as for self-employed no such distinction is readily available. As their aggregate income originates from the capital they have invested as well as the labour effort they put in, there is in practice no obvious way to disentangle the two theoretically distinct kinds of income. A method for splitting the income – referred to as the income splitting model – had to be constructed. The purpose is to single out for income splitting those firms whose owners are also working in the firm as managers, or even taking part in primary production activities. These owners are labelled “active owners”. Income splitting is mandatory for sole proprietorships, partnerships and corporations with active owners. For the owners to qualify as active owners, they must own at least two thirds of the firm, and each one must work in the firm for a minimum number of hours per year.

With a few qualifications the approach taken in the Norwegian tax system is to define capital income by imputing a return to the stock of business assets and then to calculate the labour income as the residual income. The imputed rate of return is stipulated as the interest rate on five year government bonds plus a risk premium of four percent.[1] The rationale for the imputed return is that it may be interpreted as the return that could be obtained elsewhere and is in this sense an opportunity cost of capital. In other words it is the return that would be required in order to invest in a particular business in the absence of taxes. By taxing the business as if the imputed return were obtained, the tax will not bias the investment decision either way, and neutrality is achieved.

There are two qualifications to the splitting method sketched above, that may be worth mentioning. One is that residual income over and above a certain threshold is considered to be capital income. (Exceptions to this rule apply to certain professions – doctors, brokers, lawyers, etc.). The other qualification is that active owners with employees are entitled to make a “salary deduction” from the residual before arriving at the final

[1] Whether a risk premium should be added is a controversial issue among tax economists.

estimate of labour income. The salary deduction is 20 percent of the wage bill. It has been argued that this deduction may make up for missing inclusion of self-created goodwill in the stock of business assets and that firms with many employees would otherwise be assigned an unreasonably high labour income. It is probably fair to say that the various elements of the splitting model have to some extent been played around with as part of a political game motivated in part by the concern of politicians of various colours with special interest groups. Certain key rules were changed after the principal reform in 1992, detached from its overall perspective, and at odds with the advice of the Aarbakke report. It is thought provoking in this context that a large number of firms subject to the splitting model are in fact assigned a negative labour income.

In line with the splitting rule different kinds of income are taxed differently. If we – as seems natural – interpret the imputed return as a normal rate of return on capital, the residual income will in fact not only be labour income but may also conceivably include monopoly rents, resource rents, remuneration for high risk taking and particularly favourable outcomes of random events. In this sense the dual income tax does not only tax labour income at a higher rate than "normal" capital income but also imposes a surtax on various kinds of rents. This appears to be an attractive feature of the system as such taxes tend to be non-distortionary. Generous salary deductions will however erode this effect as more income is taxed at the low rate. To the extent that risk is involved favourable outcomes will, with the above qualifications, imply a high tax burden as labour income is overestimated, whilst a loss will reduce the estimated labour income and the corresponding tax burden. Hence there is an element of risk-sharing between the private investor and the government.

Beyond the general tax rules surveyed above there are some special tax rules motivated by Norway's position as a resource-rich and sea-faring country. Special surtaxes are imposed in the petroleum and hydro-energy sectors as these are supposed to earn a resource rent beyond the normal return to the invested capital. Ship-owning companies only pay income tax when profits are distributed and not as long as profits are retained within the company. In this sense there is a tax deferral. While the tax rules devised to appropriate part of the resource rents in certain sectors have won the acclaim of most economists, the special tax rule for ship-owning companies has to a large extent been considered as a tax privilege supported by well-resourced lobbying rather than social efficiency arguments.

**Taxed-favoured owner-occupied housing**

Even though tax reforms in Norway have been guided by economic principles to a large extent, tax economists have never fully succeeded in convincing the politicians of the virtues of neutral capital taxation, and shipping is not a sole example. The most blatant violation of the principles of symmetry and neutrality is due to the low value assessment for tax purposes of selected assets. The most striking example is owner-occupied housing, including houses for leisure use, which has a long-standing history as a tax-favoured asset. The value assessment of houses for tax purposes is far – on average perhaps 80 percent – below market value. In this respect Norway differs significantly from neighbouring Denmark and Sweden that are more successful in equating tax values to market prices.

In addition to the low general valuation, there is in Norway considerable variation across vintages of houses, and there is a systematic bias in favour of expensive houses as measured by the ratio between the tax value and the price actually quoted in the market for houses being traded. As rich people typically own expensive houses, the reported bias introduces an unintentional regressive tax element. The preferential treatment of housing is reinforced by the fact that taxpayers in wealth tax position pay wealth tax on houses based on the tax value.[2] Owner occupied housing is the dominant part of the housing market in Norway, and there is extensive ownership of leisure houses. In view of the size of the housing market and the importance of houses as household assets, there is no doubt that serious tax distortions are implied.

In spite of this economically sad fact, the present government wants to phase out the income taxation of the imputed rent from owner-occupied housing altogether.[3] This step is exactly the oppo-

[2] Two further taxes may be briefly mentioned. Local communities may impose a property tax, which is also based on the tax value, but few do. In principle there is a capital gains tax on houses, but none is imposed if the seller has lived in the house for at least a rather limited period of time.
[3] Politicians will usually refer to the imputed rent tax as an 'obsolete tax', or point to alleged liquidity problems faced by some poor, old widow.

site of the policy recommended by the Skauge committee. As pointed out by many economists, this abolition is paradoxical at a time when there appears to be increasing recognition of the need to tax immobile rather than mobile assets in the face of international tax competition.

**The wealth tax**

Whereas several countries have abolished their previous wealth tax, it is still retained in Norway with rather high statutory tax rates. As there are often cumulative effects of income and wealth taxes, say, on savings and investment behaviour, the two taxes should be considered in conjunction. Even if the political attitude to the wealth tax in Norway varies along the left-to-right political axis, there is a widespread opinion that the present wealth tax has serious deficiencies.

As it fails to achieve anything near uniform taxation of various, major types of wealth, it strongly violates the cherished principles of neutrality. Whilst some assets such as bank deposits, bonds, and shares of stock listed at the stock exchange are taxed according to their market value, non-quoted shares and quoted shares in small and medium-sized companies are entitled to an explicit 'tax rebate' of 35 percent in terms of undervaluation. Various types of real estate, including owner-occupied housing, are even more tax-favoured assets. There seems to be little political will to tighten the wealth tax. On the contrary the political sentiment seems rather to be in favour of gradually removing it.

**Impacts of the 1992 reform**

Presumably the 1992 reform induced both transitory and more interesting structural effects. Even bearing in mind the identification problems posed by economic recovery and conceivable after-effects of economic liberalisation in the years subsequent to the reform, observations of after-reform changes and preliminary results from economic analyses of the reform are interesting from the perspective of allocation as well as distribution.[4] There are strong indications that the (pre-tax) return to capital has shifted to a higher level and that the dispersion of rates of return has narrowed. Both results would be consistent with the intentions of the reform since the old tax regime implied larger general tax wedges as well as differential tax treatment that were likely to generate unequal marginal returns to investment in various sectors.

Studies based on computable general equilibrium models have estimated the efficiency gain from more uniform capital taxation at 0.75 percent in terms of the equivalent increase in private consumption. Real investment has shifted to a lower level, while the after-tax real interest rate and the households' savings rate have increased. Subsequent to the reform there has been a sharp rise in distributed profits. This can partly be ascribed to transitory effects having to do with the removal of legal constraints on the scope for distributing funds previously accumulated partly in order to obtain a tax credit. But even apart from such cases, retentions were tax-favoured compared to distribution of dividends, and capital was locked into the companies with potentially harmful allocative effects.

Income inequality has increased somewhat during the nineties, and it has been debated whether the tax reform is to be blamed for this development. The observations that are reported are illustrative of the problems involved in comparing before- and after- reform distribution as the income concepts used do not reflect the same underlying economic reality. Previously some of the true income of shareholders was concealed as profits retained in the corporations, and the corresponding capital gains never, or only much delayed, materialised as shareholder income. Now the more extensive distribution of dividends after the reform is immediately registered as an increase in income. A further question is how the taxes for a given base affect the distribution of after-tax income as compared to pre-tax income. It has been revealed that the tax system is slightly less progressive than it was prior to the reform. However, it turns out that this is mainly due to inadequate adjustment to increases in certain deductions and child benefits. This was never part of the 1992 reform.

Effects for which the reform must take full responsibility are those related to income splitting. Whilst income splitting with its risk sharing property may seem appealing from an ex ante point of view, owners of firms that have already been successful may

[4] A research project is in progress to evaluate the reform as data for a sufficient time span become available.

view things differently. Rather than having a substantial part of their income taxed as labour income they would like to have it taxed leniently at the rate applied to capital income. It follows that if a significant part of the income is taxed at high tax rates there is strong motivation for finding ways to transform labour income into low-taxed capital income. This is indeed what many Norwegian entrepreneurs do. Especially active owners of corporations have escaped the split model. One way to do this is to invite more passive owners into the company to bring the ownership share of active owners below 66 percent. Between 1992 and 2000 the percentage of corporations subject to income splitting fell from 55 to 32. By avoiding mandatory income splitting the owners are free to work for a very low official salary, whilst reaping large dividends. In particular it has caught the public eye how a number of celebrities in show business and TV production manage to acquire most of their income in terms of capital income through corporations.

The extensive circumvention of the income splitting model figures as the major deficiency, some would say the Achilles Heel, of the tax system introduced in 1992. This problem was a major motivation for appointing the Skauge committee that delivered its report in 2003. Below I will concentrate on its proposals addressing the income splitting problem as these are about to win political acceptance.

**The road ahead**

It is corporations with active owners that have posed the most serious problems for the income splitting scheme. The key element of the proposed solution is to replace the previous income splitting model for active shareholders by a sophisticated income tax model for all personal shareholders (see Sørensen 2003). The previous imputation system as well as the RISK scheme will be removed. A personal shareholder tax will be imposed on share income exceeding a risk-free rate of return. The idea is to approximate the marginal tax on high share income to a somewhat lowered marginal labour tax in order to remove the motivation for income shifting, while preserving the low tax on 'normal' capital income.

For this dual purpose the tax base is defined by deducting a so-called rate-of-return allowance (RRA) from the share income consisting of dividends and any realised net capital gain. The role of the RRA is to shield the imputed risk-free return. The after-tax corporation profit may be distributed as dividends or retained within the corporation presumably generating a capital gain by pushing up the share price. In any given year the shareholder will receive the distributed dividend and keep or sell the share. If the share is kept the income being taxed at the hand of the shareholder is the dividend minus the RRA. To the extent that the dividend falls short of the RRA the difference is defined as unutilised RRA. The RRA is the product of the after-tax interest rate and a basis value of the share. The calculation of the basis takes as its point of departure the acquisition price of the share and then steps up this basis at the beginning of each year by adding any unutilised RRA.

The shareholder income tax can be shown to have a number of appealing neutrality properties with respect to investment allocation, choice of funding between injection of new equity or retained earnings and the timing of realisation of shares. The step-up in the basis for calculating the RRA is crucial for these properties. Beyond leaving the marginal investment unaffected, the shareholder income tax appropriates without distortions some of the above-normal profits on infra-marginal projects. *Ex post* it will tax away some of the returns due to favourable states of the world under uncertainty, but we should observe that *ex ante* this tax is offset in expectation terms by the prospect of tax savings in the event of losses being deductible against contemporary gains on other shares or against future gains after being carried forward with interest to preserve their present value.

For sole proprietors and partnerships the proposal is to apply a revised version of the income splitting model which is close in spirit to the shareholder income tax model. A risk-free imputed return to business assets, called the "shielded return", will be taxed as capital income while income beyond this level will be taxed as labour income. There is to be no cap on profits to be taxed as personal income, no "salary deduction" from taxable profits, and the same rule will apply to the professions such as lawyers, brokers, etc. and other tax subjects.

**Concerns with international agreements**

Even though not a member of the EU, Norway is in several respects affected by the EU legislation via

the European Economic Area (EEA) and the underlying agreement between the EU and Efta countries. A Finnish case (the Manninen case) on the agenda of the EU Court has caused concern in Norway that the Norwegian tax rules for shares may be found incompatible with the non-discrimination rules of the EEA as Norwegian and Finnish rules have strong similarities. The present imputation system and RISK rules, preventing double taxation of distributed and retained profits, apply only to income from corporations that are Norwegian tax subjects and shareholders who are liable to pay ordinary income tax in Norway. Shareholders of Norwegian corporations who are foreign tax subjects normally have to pay a source tax on top of the corporate tax already paid. Share income from foreign companies accruing to shareholders who are Norwegian tax subjects is taxed as capital income in Norway irrespective of the corporate tax liability abroad. (The only qualification is potential crediting against foreign source taxes.) I believe that these legal aspects of international commitments have affected the political climate in Norway in favour of introducing a shareholder income tax even among those politicians who have a reputation for fiercely opposing high/double taxation of dividends.

## Concluding remark

The ambitious Norwegian dual income tax experiment is interesting as it illustrates both the scope for and the limits to a tax policy trying to pursue economic principles in a high tax country, with an open economy and a strong emphasis on the distributional role of taxes. It illuminates how theory meets reality both in the form of political constraints and formidable problems with enforcing universal principles in practice. I would like to conclude that in order to redress important allocation failures, huge reforms have indeed been implemented, admittedly facing problems and set-backs, but certainly not without some measure of success.

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# Dual Income Tax: A Pragmatic Tax Reform Alternative for Germany

Christoph Spengel and Wolfgang Wiegard*

Without doubt, the German red-green coalition government has implemented substantial tax reforms since coming into office in 1998. After all, the top marginal income tax rate will be reduced from 53 percent in 1998 to 42 percent in 2005; similarly, the lowest marginal tax rate will have fallen by 10.9 percentage points, from 25.9 percent in 1998 to 15 percent in 2005. As to corporate income tax, in 2001 a uniform tax rate of 25 percent on retained and distributed profits has been introduced replacing the former tax rates of 40 percent (on retained earnings) and of 30 percent (on distributed profits). Moreover, the full imputation system has been replaced by the so called half-income method (*Halbeinkünfteverfahren*) which exempts 50 percent of dividends from personal income tax.

While lowering statutory and effective tax rates, these tax reforms have introduced considerable complications and distortions at the intersection of personal and corporate income taxes: the tax rate differentials between corporated and unincorporated firms have widened; the tax treatment of different kinds of investment and sources of finance has become more distortive; and numerous tax regulations do not conform to basic provisions of the EC Treaty. Nowadays, there is widespread agreement that the German tax system has become too complicated, that tax burdens as well as social security contributions are still too high, and that German income and business taxes are far from being neutral with respect to investment and financing decisions and to the choice of the legal form of a business. Tax experts as well as the general public agree that some fundamental tax reform is unavoidable in Germany in order to cope with international tax competition becoming fiercer.

Against this background, a variety of tax reform proposals hve emerged during the last few months. Actually, there is such a diversity of tax reform plans that even tax experts can lose orientation. Amongst the political parties, CDU and CSU presented a joint tax program called “concept 21”; the FDP submitted a “proposal for a new income tax” to parliament; finally, the SPD of Schleswig-Holstein launched its own income tax reform proposal. From academic circles, Paul Kirchhof (2003), a former judge at the Federal Constitutional Court, presented a fully integrated tax system for personal and business income; Manfred Rose (2003) continues to fight for a consumption based income tax; Joachim Lang (2004) and a group of tax law professors added the so-called “Kölner Entwurf”, whereas the German Council of Economic Experts (2003) favors a dual income tax (DIT) for Germany. All these proposals differ in detail as well as in substance. What they have in common, however, is the aim to simplify the tax system and reduce tax rates.

In the following sections we will outline the need for a fundamental tax reform in Germany in more detail, and we will argue that the DIT is a pragmatic, but serious reform candidate.

### Is Germany a low-tax or a high-tax country?

According to OECD revenue statistics, the tax-revenue-to-GDP-ratio (taxes on income and profits) in Germany is one of the lowest amongst OECD countries. In 2002, it amounted to 10.1 percent

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only, whereas the EU-15 average was 14.1 percent. Including social security contributions, the corresponding figures in 2002 were 36.2 for Germany and 40.5 for the EU-15. This could lead to the conclusion that Germany is a low-tax country and further tax reductions were unwarranted; instead, social security systems should be reformed, possibly including a shift from contributions to taxes.

Even if the numbers were correct, these conclusions would be misleading for a number of reasons. One main objection is that aggregate tax ratios do not allow any conclusion as to the incentive effects of taxes on investment, savings, work effort or other decisions. High unemployment, sluggish investment demand and a weak growth performance constitute the major problems of the German economy. However, no investor is interested in aggregate tax ratios when considering additional investment in an established firm or when deciding about the creation of a new firm at alternative locations in, say, France, Germany, Ireland or elsewhere. By contrast, there is clear evidence that it is the marginal or the average effective tax burden on investments that is relevant for investment and location decisions.

Similarly, labor demand and supply decisions depend on effective tax burdens on wages, including social security charges and payroll taxes, but not on aggregate tax-to-GDP ratios. Measuring the effective tax burden on capital and labor is no easy exercise, and different methods may yield different results; see the papers in Sorensen (2004). Most studies, however, agree that Germany is a high-tax country with respect to effective tax burdens on capital as well as on labor. Table 1 displays statutory and effective average tax rates at the corporate level in different EU member states, excluding additional tax burdens on shareholders.

In the first column, we compare nominal (statutory) corporate tax burdens. In Germany, for example, these include the corporate tax rate of 25 percent (26.5 percent in 2003), the local trade tax at an assumed average municipal levy of 428 percent and the solidarity surcharge of 5.5 percent. In the second column, we present effective average tax rates, taking into account different tax depreciation schemes, essential features of inventory valuation and other rules concerning the determination of the tax base. Effective tax rates are calculated by following the Devereux-Griffith-methodology (see Devereux and Griffith 1998, 1999, or Schreiber, Spengel and Lammersen 2002). Effective average tax rates are of crucial importance for discrete location decisions, whereas effective marginal rates indicate the tax burden on marginal investment at a given location. Table 1 illustrates that in Germany effective average tax rates are the highest in the EU, while for statutory rates Germany ranks second close behind Italy.[1] Hence, there is

**Table 1**

**Nominal tax rates and effective average tax burden on corporate income**

| | Nominal[a] (percent) | Rank | Effective[b] (percent) | Rank |
|---|---|---|---|---|
| Austria | 34.00 | 8 | 29.00 | 10 |
| Belgium | 33.00 | 9 | 35.60 | 3 |
| Cyprus | 15.00 | 23 | 14.52 | 23 |
| Czech Republic | 31.00 | 10 | 24.18 | 16 |
| Germany | 39.35 | 2 | 36.00 | 1 |
| Denmark | 30.00 | 11 | 27.80 | 12 |
| Estonia | 26.00 | 18 | 22.52 | 18 |
| Spain | 35.00 | 4 | 32.00 | 7 |
| Finland | 29.00 | 15 | 27.40 | 14 |
| France | 34.33 | 7 | 35.80 | 2 |
| Greece | 37.50 | 3 | 27.80 | 12 |
| Hungary | 19.60 | 21 | 19.37 | 21 |
| Ireland | 12.50 | 25 | 10.80 | 25 |
| Italy | 40.00 | 1 | 28.80 | 11 |
| Lithuania | 19.00 | 22 | 13.11 | 24 |
| Luxembourg | 29.89 | 14 | 33.20 | 4 |
| Latvia | 15.00 | 23 | 17.76 | 22 |
| Malta | 35.00 | 4 | 32.81 | 6 |
| Netherlands | 34.50 | 6 | 32.90 | 5 |
| Poland | 27.00 | 17 | 24.73 | 15 |
| Portugal | 30.00 | 11 | 31.70 | 8 |
| Sweden | 28.00 | 16 | 23.60 | 17 |
| Slovak Republic | 25.00 | 19 | 22.10 | 19 |
| Slovenia | 25.00 | 19 | 21.60 | 20 |
| United Kingdom | 30.00 | 11 | 29.10 | 9 |
| Average | | | | |
| EU-25 | 28.59 | | 26.17 | |
| EU-15 | 31.80 | | 29.43 | |
| Accession Countries | 23.76 | | 21.30 | |

[a] Federal and local profit taxes, base year: 2003. – [b] Base year EU-15: 2001, Accession Countries: 2003.

Source: Spengel (2004 a).

[1] In Germany, the solidarity surcharge of 5.5 percent is levied on the corporation tax rate of 25 percent, increasing it to 26.375 percent. Since trade tax is deductible form corporation tax, the nominal tax rate on profits amounts to 39.35 percent (= 26.375% + 17.62% – 17.62% * 26.375%).

good reason to consider Germany as a high-tax country. And international tax competition will become even stronger. As Table 1 illustrates, corporate tax rates are considerably lower in the new EU member states than in Germany. Moreover, when comparing the ranking of the countries from the highest to the lowest statutory and effective tax rate it is clearly evident that the statutory tax rate is a crucial factor for the determination of the effective average tax rate on corporate profits.

As a reaction, some of the old member states of the EU are planning tax reforms in order to improve their position in international tax competition. In 2005, Austria will reduce its corporate tax rate to 25 percent from currently 34 percent, Finland to 26 percent from 28 percent, and France is considering a switch from the imputation system to the half-income method, combined with a reduction of effective tax burdens on corporate income.

German tax policy has no other choice but to react too. The options are very limited. First, one could try to fix minimum corporate tax rates in the EU. Due to the unanimity principle in taxation matters, however, success is very limited. Why should low-tax countries agree to abolish one of their major advantages when competing for internationally mobile capital? Furthermore, to achieve unanimity on minimum tax rates will require such a long time that the tax competition game will be lost for Germany before new rules have been enacted. As a consequence, Germany has no other choice but to accept the rules of the game and to lower its tax rates as well. To become attractive as an investment location, the total tax burden on business income should be reduced to about 25 percent, but definitely not exceed 30 percent.

### Neutrality of the tax system

A second defect of the German income tax system concerns its lack of neutrality with respect to investment and financing decisions and to the choice of the legal form of businesses. From an efficiency point of view, taxation should not interfere with the production sphere according to the Diamond/Mirrlees production efficiency theorem.

As a matter of fact, the current income tax system does not meet any neutrality requirements. This is illustrated in Table 2, which compares tax burdens of corporated and unincorporated businesses. In the upper part we consider tax burdens when profits are retained; the lower part includes the taxation of dividend payments at the shareholder level. Throughout, we assume that the top marginal income tax rate applies. An unincorporated business is subject to personal income tax, solidarity surcharge and trade tax, the latter being partly offset against the personal income tax; there is no difference in the tax treatment of retained and distributed earnings. This does not hold for the taxation of corporate profits. Retained earnings are subject to corporate income tax, trade tax and solidarity surcharge. Distributed profits are subject to additional taxes. According to the half-income method, one half of the dividend is subject to personal income tax including solidarity surcharge. Therefore, retained earnings are treated more favourably than distributed profits.

A comparison of corporations with non-corporations reveals that the latter are taxed more heavily in case of retained earnings but they are treated more favourably in case of distributions. In this case the tax discrimination of corporations has been steadily increasing in the past few years, since the marginal personal income tax rate has been reduced.

The CDU/CSU tax reform proposal would make things even worse. According to this proposal, a top marginal income tax rate of 36 percent should be supplemented by a corporate income tax rate of 36 percent. Adding taxes on dividends under the half-income method would increase the total tax burden on equity to about 47.5 percent [= 36 +

**Table 2**

**Statutory tax rates* in Germany, planned reform stages**

| | (1) Corporation | (2) Unincorporated business | (1) – (2) |
|---|---|---|---|
| | Retained Earnings | | |
| 2003 | 40.7 | 52.0 | –11.3 |
| 2004 | 39.4 | 48.9 | – 9.5 |
| 2005 | 39.4 | 46.3 | – 6.9 |
| | Distributed Earnings | | |
| 2003 | 55.8 | 52.0 | + 3.8 |
| 2004 | 53.2 | 48.9 | + 4.8 |
| 2005 | 52.8 | 46.3 | + 6.5 |

* Top marginal income tax rate; municipal levy of 428 percent on local trade tax.

Source: own calculations.

(64/2) x 0.36]. The tax rate differential between corporate and non-corporate income would almost be doubled as compared to the situation in 2005.

Similarly, the FDP draft for a new income tax would distort financing decisions and discriminate investment activities. The FDP is planning to tax retained earnings and distributions at a uniform top marginal rate of 35 percent but interest income at only 25 percent. This would not only favour debt financing over retained earnings and new equity but also increase the cost of capital and thereby reduce investment. This becomes clear if we assume a bank deposit with a risk-free rate of return of 10 percent before taxes, and of 7.5 percent net of taxes. Then the cost of capital, i.e. the pre-tax rate of return necessary for an investment to yield at least the net-of-tax return of the financial asset, amounts to 11.54 percent [11.54 – 0.35 x 11.54 = 7.5]. If a uniform tax rate was imposed on all financing alternatives, the cost of capital would drop to 10 percent. Hence, the FDP tax provisions will suppress all investment projects yielding a gross-of-tax rate of return between 10 percent and 11.54 percent.

**Tax simplification**

It is certainly true that the German income tax law is much too complicated. All the different tax reform proposals agree that simplification of tax laws ranks very high on the reform agenda. Unfortunately it is not clear at all what tax simplification really means. One interpretation is that tax laws should be understandable not only to tax professionals but to the layman as well. This is the basic idea behind the "Tax Law Rewrite" of the UK Inland Revenue, a project which intends to make tax laws clearer and easier to read. But there are natural limits to this endeavour. The taxation of stock options or of foreign subsidiaries, for example, refer to rather complicated issues which are not easily accessible to the layman; and one may wonder whether definitions like "A single animal may constitute a herd"[2] will really reduce his confusion.

The sheer length of the tax code could be another indicator of the tax system's complexity. According to Paul Kirchhof (2003, p. VII), a clear sign of the simplicity of his tax reform proposal is the reduced number of paragraphs and words. Whereas the current income and corporate income tax laws in Germany together count 235 paragraphs and 109,489 words, his draft gets along with only 23 paragraphs and 1,715 words. These are impressive numbers but one can doubt that fewer words and paragraphs really contribute to tax simplification. A detailed set of tax provisions may make tax planning simpler than gray areas in the tax law, which are almost unavoidable when complicated real world taxation issues are compressed in a few words and paragraphs.

Economists, therefore, use a third criterion to evaluate the complexity of a tax system and its need for simplification. These are the resource and compliance cost of collecting taxes and of filing tax returns. The more complicated a tax system is, the more money is spent on tax accountants, taxation guides or computer software and the more time is devoted to keep track of tax documents, to file tax returns and, for the tax authorities, to audit tax returns and other documents. From an economic point of view, simplifying the tax system is equivalent to reducing its compliance cost. A neutral tax system would contribute greatly to the reduction of compliance costs. If taxes are neutral, they do not interfere with investment or financing decisions; there is no room for sophisticated tax-avoidance strategies; and there is no need to re-optimize in the presence of taxes. In this sense, tax simplification is not a separate tax reform goal but part of the broader goal of tax neutrality.

**Implications for the German tax reform debate**

The weaknesses of the German tax system, sketched in the preceding sections, define the main tasks for a fundamental tax reform in Germany. In our view, the most important point is to reduce tax burdens on internationally mobile tax bases. Statutory tax rates on business income will have to be reduced to a maximum of 30 percent if Germany is to become a more attractive location for international investment. Higher investment would also increase labor productivity and wages. Even if it may sound bizarre to non-economists, in an open economy, wage earners can benefit from a reduction of capital income taxes. A second important task is to make the tax system more neutral with respect to investment and financing decisions and to the choice of the legal form of a business. All

[2] Income Tax (Trading and Other Income) Bill, Part 2, Chapter 8, 117 (4) of the United Kingdom.

these decisions should be independent of tax considerations. The rate of return on real estates, shipping shares or film rights should signal relative scarcities and direct capital to its most productive use. Instead, under the current law, investment in special activities is guided by tax loopholes or generous loss allowances. Neutrality of the tax system would also contribute to tax simplification because there would be no need to re-optimize investment or financing decisions in the presence of taxes. Tax neutrality requires integration of the corporate income tax into the personal income tax. Any tax reform proposal neglecting this requirement will miss the point.

There are, of course, other elements to take into account for a fundamental tax reform. First, taxes should be "fair". Admittedly, fairness is a very vague concept; in the end, it is not a question of economics but an ethical issue. However, most people would agree that the average tax rate should increase with income. An open question is whether or not the marginal income tax rate, too, should increase with income. Second, revenue requirements define a serious constraint on any fundamental tax reform. Any tax reform proposal implying a considerable loss of revenue is bound to fail in the political process; a minimum requirement is to reveal how to compensate for possible revenue losses. Third, any tax reform must be compatible with EU law.

Unfortunately, some of the goals of and constraints on tax policy are conflicting. The most well-known and controversial conflict is the trade-off between equity considerations and economic efficiency. The more progressive the tax system is, the more it reduces incentives to invest, to work harder or to acquire education and training. In the political arena, equity considerations clearly dominate efficiency arguments. In our view, the main problems in Germany are not a lack of distributional justice but insufficient economic growth, low investment activities and high unemployment. As a consequence, efficiency consideration should be given more weight in re-designing the tax system.

**Outlines of a reform of the corporate and personal income tax**

With respect to the above mentioned criteria the introduction of a flat tax would be the preferential solution. An alternative solution, however, could be a dual income tax. The following deals in more detail with both options for reforming corporate and personal income taxation in Germany.

The crucial element of a flat tax is an income tax schedule which combines a constant marginal tax rate and a considerable personal allowance. The annual personal allowance could amount to EUR 10,000 for singles; couples would receive a doubled allowance of EUR 20,000. Each euro above the personal allowance would be taxed at the uniform income tax rate. In order to strengthen the attractiveness of Germany as a location for internationally mobile production factors and companies, the income tax rate should not exceed 30 percent. If we assume an annual personal allowance of EUR 10,000, annual income tax payments would amount to 1,500, 3,000 and 4,500, respectively, if the taxable income is EUR 15,000, 20,000 or 25,000. Consequently, taxable income is subject to an effective burden of income tax of 10, 15 or 18 percent. Since the average burden of income tax increases with an increase of taxable income, a flat tax obviously is a progressive income tax. In order to render the maximum rate of 30 percent effective, personal tax benefits such as the exemption of additional remunerations for work on Sundays and public holidays and for night-work should therefore disappear.

A flat tax in the area of personal income taxation has to be amended by a reform of corporate income tax. Firstly, the rate of corporate income tax should equal the personal income tax rate of, say, 30 percent. This maximum tax rate includes surcharges on corporate and personal income tax (e.g. the German solidarity surcharge of currently 5.5 percent) as well as local surcharges which should replace the trade tax levied by communities in Germany. Secondly, with respect to the taxation of corporations, dividends and capital gains upon the disposal of shares from corporations should be exempt from both corporate and personal income tax. As a result, corporate income tax would be definite and double taxation on corporate income would be avoided.

A flat tax offers several advantages: with regard to the uniform marginal tax rate arbitrage would be limited to a considerable extent in the field of personal income tax. There would be no incentives, for example, for income shifting in periods where the marginal tax rate is low while deducting expenses and allowances in periods with a high marginal tax rate. Moreover, the discussion about the taxation of families and spouses would come to an end since

income splitting between spouses and family member would no longer offer advantages. Finally, personal income taxes on earned income and a considerable part of capital income (e.g. income from interest and royalties) could be collected by levying final withholding taxes at source. Profits made by partnerships, sole proprietors and corporations would be subject to a uniform rate irrespective of whether they are retained or distributed. Since interest income from debt financing would also be taxed at the same rate, a flat tax would make income taxation widely neutral towards decisions with respect to the financing and the choice of legal business forms.

The above-mentioned advantages of a flat tax, however, are counterweighted by two disadvantages. A radical cut in the marginal personal income tax rate to 30 percent and its unification with the corporate income tax would result in a considerable loss of tax revenue. From the reform proposals which are currently in the centre of discussion, the model developed by Paul Kirchhof (2003) is closest to a flat tax. This model suggests a maximum income tax rate of 25 percent. According to official estimates the proposal of Kirchhof would result in a loss of tax revenue in the first year of EUR 40 billion. In the long run, after cutting back all major tax incentives, the annual loss of tax revenue would still amount to at least EUR 12 billion. With a tax rate of 30 percent, the deficiency in tax receipts would be certainly less but still considerable. Since it is impossible to increase the net borrowing of the state at the moment, a corresponding reduction in public spending would be necessary. There is evidence from past experience that it seems very difficult or even impossible to reach political consent about such a large reduction in public spending.

A second objection could refer to the distributional effect of a flat tax. In comparison to a situation without levying taxes, income will still be redistributed from high to low income brackets. If we refer to the current tax rate as a benchmark, however, the introduction of a flat tax obviously favours richer household vis-à-vis individuals which have an income just above the tax free personal allowance. Both aspects – a considerable loss in tax revenue and a reduced intensity of redistribution compared to the status quo – become even more important if the current proposals of introducing a lump sum premium (*Kopfpauschale* or *Gesundheitsprämie*) in the area of compulsory health insurance are realised. In this situation necessary social transfers to individuals with low income have to be financed by increasing the tax burden on richer households. However, this would be in conflict with the loss of tax revenue and the disproportionate tax relief of richer households accompanied by the introduction of a flat tax. If instead social transfers were financed by an increase of the value added tax, the resulting distributional effects would even be more objectionable. Since value added tax is regressive this option results in a disproportional increase of the tax burden on low income.

Although a flat tax would offer considerable advantages the loss of tax revenue and the objectionable effects of redistribution raise doubts whether a flat tax is a realistic option for tax policy in the near future. However, a fundamental reform of the personal and corporate income tax cannot be postponed until that time. In particular with respect to the increased international tax competition action is necessary. Otherwise, even more mobile business activities will be shifted from Germany to low tax jurisdictions abroad. Therefore, the German Council of Economic Experts has proposed the introduction of a dual income tax as a second-best solution. Among others, Hans-Werner Sinn also argues in his well-known book *Ist Deutschland noch zu retten?* (Is There Any Hope for Germany? 2004) also argues in favour of a dual income tax.

A dual income tax allows a considerable reduction in the tax burden on internationally mobile capital income without threatening total tax revenues too much. Therefore, under a dual income tax, capital income and earned income are taxed separately and are subject to different tax rates. Capital income is defined very broadly. It covers income from businesses, dividends, interest receipts, royalties, rental income and capital gains. By contrast, earned income covers employment income including income of the self-employed, pensions and compulsory old-age pensions. Capital income is subject to a uniform and proportional tax rate of not more than 30 percent. Under a dual income tax, the taxation of corporations is the same as under a flat tax (i.e. full integration of corporation tax into personal income tax: the corporation tax rate equals the personal income tax rate, and both

dividends and capital gains upon the disposal of shares are exempt from income taxes).

In contrast to capital income, earned income is taxed at a progressive rate. Although the detailed structure of the tax rate is less important there are good reasons to introduce a graduated tariff. As a benchmark, the tax rate on earned income could vary between 15 and 35 percent. This seems to be feasible from a political standpoint. For the short term one could accept also a marginal tax rate of 42 percent (which equals the marginal personal income tax rate in the current tax system as from 2005) if losses in tax revenue cannot be compensated otherwise. This leaves room for subsequent tax rate reductions.

Similar in its effect to the flat tax, the dual income tax makes income taxation widely neutral towards decisions with respect to the financing and the choice of the legal business forms. It also makes it possible to collect taxes on capital income by levying final withholding taxes. Moreover, the dual income tax reduces the effective tax burden where it is most urgent, i.e. in the field of internationally mobile income.

As a result of the separate taxation of capital income and earned income the loss of tax revenue would be limited. This is also important with respect to reforming company taxation in the European Union. If the proposals of a common consolidated tax base for multinationals with a subsequent division of the tax base to the member states were introduced (see European Commission 2001), a closer coordination of the national tax rates on capital income would be necessary (see Spengel, 2004b). A dual income tax obviously maintains the flexibility of the member states to adjust their tax rates accordingly.

Finally, there is evidence that a dual income tax may lead to an increase in investments, capital accumulation, GDP and household consumption. Such a welfare gain is mainly based on the increase in lifetime wealth as a result of the lower tax burden (see Fehr and Wiegard 2004 or Radulescu and Stimmelmayr 2004).

A dual income tax, however, also causes problems. Firstly, the separate and different taxation of capital income and earned income might be questionable with respect to the ability to pay principle. But one has to admit that capital income and earned income in Germany – although treated equally from a legal perspective – are taxed differently in reality since internationally mobile capital income can escape more and more from taxation. Secondly, and even more severe are the incentives to transform earned income, which is taxed at higher progressive rates, into capital income which is taxed at lower proportional rates. In particular, these incentives exist in closely held companies (i.e. those with only a small number of shareholders). Under a dual income tax, therefore, total profits of closely held companies have to be divided into earned income and capital income. With respect to this division of income one could benefit from the experience of the Nordic countries. Finland, Norway and Sweden all introduced a dual income tax at the beginning of 1990. In any case, the division of income is a difficult task and known as the Achilles heel of the dual income tax.

## Conclusion

In the field of personal and corporate income taxation in Germany action is needed. Germany has to reduce the effective tax burdens on internationally mobile activities – i.e. capital income including business profits – in order to survive in the ongoing international tax competition. One can complain about this situation but it cannot be changed. Most of the current proposals for reforming income taxation in Germany – in particular those by made by the political parties – concentrate on the taxation of individuals without taking serious account of company taxation and the interaction of corporation tax with personal income tax.. These areas, however, are the real challenges for tax reform. A flat tax and a dual income tax are both options for reforming company taxation and the taxation of capital income. At the same time the attractiveness of Germany as a place of location for investments could be increased considerably. Both proposals have specific pros and cons. However, compared to the current system of income and company taxation they seem to have considerable advantages. Now it is up to the politicians to act.

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# Towards Dual Income Taxes – A Country-comparative Perspective

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Many western European countries have been moving away from comprehensive towards dual income tax systems since the middle of the 1980s. Within a comprehensive system of income taxation all forms and sources of income are (or should be) subject to the same – mostly progressive – income tax schedule. By contrast, a dual income tax system treats capital income and non-capital (labour) income differently. Moreover, in the pure form of a dual income tax system the capital income and the corporate income tax rate are identical, and no exemptions are granted (Cnossen 1997).

In the existing dualised income tax systems, as a rule, income from (employed or self-employed) labour is subject to a progressive tax schedule, while some or all capital income (interest, dividends and realised capital gains[1]) is taxed at lower and proportional rates. Pioneers of dual income taxation were the northern countries (Denmark 1987,[2] Sweden 1991, Norway 1992, Finland 1999; Cnossen 1999), as well as Austria 1993–96 (Fehr 2002). Also many central and east European countries (CEEC) introduced dualised income tax systems in the course of the transformation process. This article surveys the current design of income tax systems in the 15 established EU member states, in the ten central and east European accession countries, as well as in the US, Japan and Switzerland. The focus is on capital income taxation and, thus, on the degree of dualisation. Moreover, the article discusses some equity and efficiency implications of dual income taxes.

## Taxation of private capital income in comparison

Figure 1 contains a classification of the existing systems of the taxation of capital income (interest

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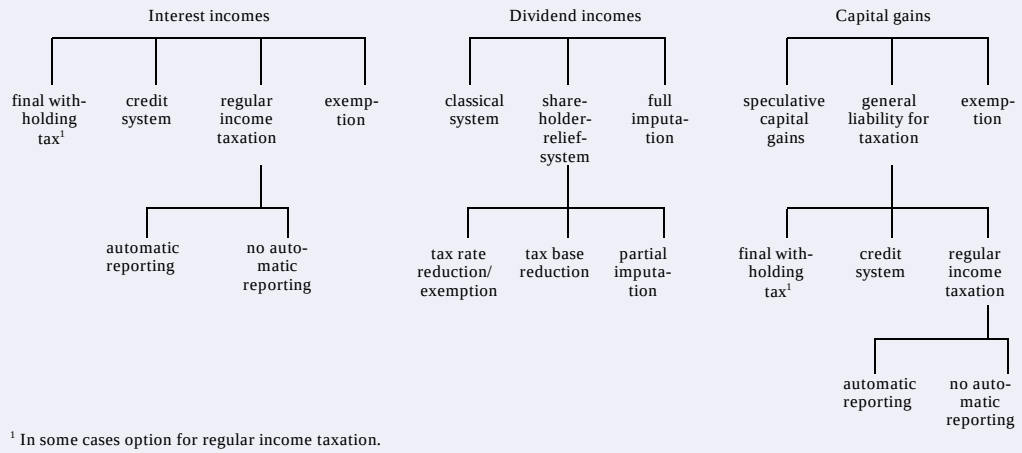
[1] The existing income tax systems only tax realised capital gains, if at all.
[2] In Denmark, however, progressive elements were re-introduced into capital income taxation soon after the reform of personal income taxation.

**Systems of capital income taxation**




[1] In some cases option for regular income taxation.

Source: author.

**Table 1**

**Interest taxation in Europe, the US, and Japan in 2002[a)]**

| | Residents | | | | Non-residents[b)] | |
|---|---|---|---|---|---|---|
| | source tax % | max. % | System of interest taxation | automatic reporting | source tax % | Internat. information exchange[c)] |
| B | 15 | 15 | Final withholding tax[d)] | No | – | No |
| DK | - | 59[e)] | Regular income tax. | Yes (1977) | – | Diverse |
| D | 30/35[f)] | 51.2[e)] | Credit system | No | – | No |
| FIN | 29 | 29 | Final withholding tax[d)] | Yes | – | DTA partners |
| F | 25 | 25 | Final withholding tax[d)] | Yes (1984) | 15[g)] | Diverse |
| GR | 15[h)] | 15 | Final withholding tax | No | 15[g)] | No |
| GB | 20 | 40[e)] | Credit system | Yes (1952) | 20[g)] | Diverse |
| IRL | 20[h)] | 42[e)] | Credit system | Yes (1992) | 20[g)] | No |
| I | 12.5/27[g)] | 12.5/27 | Final withholding tax | No | 12.5/27[g)] | No |
| LUX | – | 39[e)] | "pure" reg. income tax. | No | – | No |
| NL | – | –[i)] | Regular income tax. | Yes (1987) | – | No |
| A | 25 | 25 | Final withhold. tax[d) j)] | No | – | No |
| P | 20 | 20 | Final withhold. tax[d) k)] | No | 20[g)] | No |
| S | 30 | 30 | Final withholding tax | Yes (1986) | – | Diverse |
| E | 18 | 48[e)] | Credit system | Yes (1985) | 18[g)] | No |
| BG | 15 | 15 | Final withholding tax | No | 15 | n.a. |
| EST | –[l)] | 0 | Exemption | No | –[l)] | n.a. |
| LV | 5[l)] | 5 | Final withholding tax | No | 5[l)] | n.a. |
| LT | 15[m)] | 15 | Final withholding tax | No | 15 | n.a. |
| PL | 20 | 20 | Final withholding tax | No | 20 | No |
| RO | 10 | 10 | Final withholding tax | No | 10 | n.a. |
| SK | 15 | 15 | Final withholding tax | No | 15 | No |
| SLO | 25 | 50 | Credit system | No | 25 | n.a. |
| CZ | 15 | 15 | Final withholding tax | No | 15 | No |
| H | 18[n)] | 18 | Final withholding tax | No | 18 | No |
| CH | 35 | 41[e)] | Credit system | No | 35 | No |
| J | 20 | 20 | Final withholding tax[d)] | Yes | 15 | Diverse |
| USA | - | 44.8[e)] | Regular income tax. | Yes | 30[g)] | Canada |

[a)] For interest from fixed-interest securities; with a few exceptions also for deposits at financial institutes. – [b)] In double taxation agreements (DTA) differing source taxes may be stipulated. – [c)] For interest payments by banks. – [d)] Option for regular income taxation. – [e)] Top income tax rate including surcharges. – [f)] 35% for interest from OTC-securities. – [g)] Several special rates and exemptions for interest from specific bonds or accounts partly reserved for non-residents. – [h)] No source tax on interest from specific government bonds. – [i)] No actual income tax but tax rate of 30% on a fictitious return of net property; factitiously therefore 1.2% on net property (i.e. property tax instead of income tax. – [j)] Final taxation also with respect to estate tax for specific interest incomes. – [k)] For interest from specific fixed-interest securities increase by 5% (substitute for estate tax). – [l)] 26% (Estonia), 10% (Lithuania) for interest payments by foreign banks. – [m)] No source tax on interest payments by foreign banks or international institutions. – [n)] No source tax by interest from government bonds or from the national bank.

Sources: PriceWaterhouseCoopers (1999); Lenain and Bartoszuk (2000); Huizinga and Nicodème (2001); Ministry of Finance (2002); Martinez-Serrano and Patterson (2003); national tax codes.

and dividend income as well as realised capital gains[3]) accruing to private households.

In the group of countries considered four different interest taxation regimes can be distinguished (Figure 1 and Table 1).

A majority of the old and new member countries as well as Japan tax interest income at source, applying a relatively low final withholding tax rate. In some of these countries taxpayers may opt for regular income taxation.[4] Estonia is the only country that as a rule fully exempts interest income from taxation. The other countries examined include interest income in regular income taxation, often applying a withholding tax which can be credited against the assessed income tax liability (credit system). If not, the taxation regime can be characterised as a regular income taxation system. If there is no system of automatic reporting which secures taxation by obliging the interest-paying institution to inform the tax authorities about interest payments to domestic residents (as in Denmark), such a system of "pure" regular income taxation enables investors to escape taxation (e.g. by holding capital abroad). A credit system without automatic reporting offers the possibility of partially avoiding taxes to the extent that the personal income tax rate exceeds the withholding tax rate.

[3] Other capital incomes, e.g. rent or leasing incomes, are neglected.
[4] This option is more favourable for taxpayers whose personal income tax rate is lower than the rate of the final withholding tax.

**Table 2**

**Dividend taxation in Europe, the US, and Japan in 2002**

| | CIT %[a) b)] | System of dividend taxation | Residents | | | Non-residents source tax %[e)] |
|---|---|---|---|---|---|---|
| | | | With-holding tax %[c)] | Max. %[d)] | Aut. reporting | |
| B | 40.2 | Shareholder Relief (tax rate reduction) | 25[f)] | 55.2 | No | 25 |
| DK | 30 | Shareholder Relief (tax rate reduction) | 28/43[g)h)] | 60.1 | Yes | 28 |
| D | 26.4 | Shareholder Relief (tax base reduction)[i)] | 26.4 | 44.2 | No | 26.4 |
| FIN | 29 | Full imputation | – | 29 | No | – |
| F | 35.4 | Full imputation | – | 60.8 | Yes | 25 |
| GR | 37.5 | Shareholder Relief (tax exemption) | – | 37.5 | No | – |
| GB | 30 | Shareholder Relief (part.imp.+tax rate red.)[j)] | – | 47.5 | No | – |
| IRL | 16 | Classical | – | 51.3 | No | – |
| I | 36[k)] | Full imputation | 12.5[l)] | 46.2 | No | 27 |
| LUX | 22.9 | Shareholder Relief (Tax base reduction)[i)] | 20 | 37.9 | No | 20 |
| NL | 34.5 | Shareholder Relief (tax rate reduction)[m)] | 25 | 50.9 | No | 25 |
| A | 34[k)] | Shareholder Relief (tax rate reduction) | 25[n)] | 50.5 | No | 25 |
| P | 30 | Shareholder Relief (Tax base reduction)[i)] | 20[f)o)] | 44 | No | 20 |
| S | 28 | Shareholder Relief (tax rate reduction) | 30[f)] | 49.6 | Yes | 30 |
| E | 35 | Shareholder Relief (Teilanrechnung) | 18 | 49.3 | No | 18 |
| BG | 15 | Shareholder Relief (tax rate reduction) | 15[f)] | 27.8 | n.a. | 15 |
| EST | 26[p)] | Full imputation | – | 26 | n.a. | 26 |
| LV | 22 | Shareholder Relief (tax exemption) | – | 22 | n.a. | 10 |
| LT | 15 | Shareholder Relief (tax rate reduction) | 29[f)] | 39.7 | n.a. | 29 |
| PL | 28 | Shareholder Relief (tax rate reduction) | 15[f)] | 38.8 | n.a. | 15 |
| RO | 25 | Shareholder Relief (tax rate reduction) | 5[f)] | 28.8 | n.a. | 5 |
| SK | 25 | Shareholder Relief (tax rate reduction) | 15[f)] | 36.3 | n.a. | 15 |
| SLO | 25 | Shareholder Relief (Tax base reduction)[q)] | 25 | 47.5 | n.a. | 15 |
| CZ | 31 | Shareholder Relief (tax rate reduction) | 15[f)] | 41.4 | n.a. | 15 |
| H | 18 | Shareholder Relief (tax rate reduction) | 20[f)r)] | 34.4 | n.a. | 20 |
| CH | 25[s)] | Classical | 35 | 55.8 | No | 35 |
| J | 35.2 | Shareholder Relief (partial imputation) | 20[t)u)] | 57.9 | No | 20 |
| USA | 39.9 | Classical | – | 66.8 | Yes | 30 |

[a)] Corporate income tax (CIT) rates including surcharges, excluding local business taxes. – [b)] In the CEEC often special tax rates in special economic zones apply. – [c)] Withholding tax; credited against personal income taxes if not noted otherwise (see also footnote 6). – [e)] Maximum combined statutory tax rate, resulting from CIT on distributed dividends and personal income tax of shareholder. – [f)] In double taxation agreements (DTA) differing source taxes may be stipulated. – [f)] Final withholding tax. – [g)] Final withholding tax; option for regular income taxation. [h)] 28% for dividends up to 29.700 dKr; 43% for higher dividends. – [i)] 50% of dividends are tax exempt for the shareholder („half-income system"). – [j)] Credit with 1/9 of dividend; income tax rate 10% for low incomes, 32,5% for higher incomes on dividend including tax credit. – [k)] Special tax rate 19% in Italy, 25% in Austria on that part of profits which corresponds to the market interest rate of additional equity capital. – [l)] Option for final withholding tax instead of full imputation for minor holdings. – [m)] 25% income tax for substantial holdings, otherwise lump-sum-taxation. – [n)] Final withholding tax or option for reduction of income tax rate to half of the regular income tax rate ("half-tax rate-system"). – [o)] 9% for listed shares; increase by further 5% (substitute for estate tax). – [p)] Non-distributed profits are exempt from CIT. – [q)] 40% of dividends are tax exempt for the shareholder. – [r)] 35% for "excessive" dividends. – [s)] Average tax rate. – [t)] Option for withholding tax of 35%. – [u)] Crediting of 6.4% to 12.8% of distributed dividends.

Sources: PriceWaterhouseCoopers (1999); Lenain and Bartoszuk (2000); Federal Ministry of Finance (2002); Mitra and Stern (2003); Mennel and Förster (no year); national tax codes; own calculations.

*Taxation of dividend income*

Table 2 provides an international comparison of the taxation of dividends distributed to private investors.

The effective statutory tax rate for distributed dividends is determined by the interaction of corporate and personal income taxation. In pure "classical" systems dividends are double-taxed: on the corporate level (corporate income taxation) and on the shareholder level (personal income taxation). The effective combined statutory tax rate on distributed profits depends on the levels of the corporate and the personal income tax rate. So-called shareholder-relief-systems alleviate or avoid double taxation at the shareholder level: double taxation can be mitigated by allowing the shareholder to credit a certain share of the corporate income tax against his personal income taxes (partial imputation system), by taxing distributed dividends at reduced tax rates (tax rate reduction) or by taxing only a part of distributed dividends (tax base reduction).

Double taxation is completely avoided by full tax exemption of distributed profits at the shareholder

**Table 3**

**Maximum statutory tax rates in percent for private realised capital gains from financial investment in Europe, the US, and Japan in 2002**

| | Speculative capital gains[a] | | General tax liability | automatic reporting |
|---|---|---|---|---|
| B | – | | 17[b]/34[c] | No |
| DK | 28/43[d][e] | (3 years) | 28/43[d][f] | No |
| D | 25.6[g] | (1 year) | – | No |
| FIN | – | | 29[d] | No |
| F | – | | 16[d] | No |
| GR | – | | – | – |
| GB | 40[h] | (2 years) | up to 38[i] | No |
| IRL | – | | 20[d][j] | No |
| I | – | | 27[2]/12.5[d] | No |
| LUX | 39[h] | (6 months) | 39[b][h] | No |
| NL | – | | 25[b][d] | Yes |
| A | 25[k] | (1 year) | 25[b][k] | No |
| P | 10[c] | (1 year) | – | No |
| S | – | | 30[d] | No |
| E | | (2 years[l]) | 17[d] | No |
| BG | – | | 10[d] | n.a. |
| EST | – | | 26[d] | n.a. |
| LV | – | | – | – |
| LT | 10[d] | (1 year) | – | n.a. |
| PL | – | | – | – |
| RO | – | | – | – |
| SK | – | | 38[h] | n.a. |
| SLO | – | | 50[h] | n.a. |
| CZ | 15[d] | (6 months) | – | n.a. |
| H | – | | 20[d] | n.a. |
| CH | – | | – | – |
| J | 20[d] | (5 years) | 10[d][g][m] | No |
| USA | 44,8[h] | (1 year) | up to 20[n] | Yes |

[a] Tax rates for capital gains realised from securities held for a specified period of time only ("speculative" capital gains); in brackets the "speculative" period of time. – [b] For substantial holdings (defined differently across countries). – [c] Final withholding tax or option for regular income taxation. – [d] Final withholding tax. – [e] 28% for capital gains up to 39,700 dKr; 43% for higher capital gains. – [f] Non-listed shares: 28% for capital gains up to 39,700 dKr, 43% for higher capital gains; listed shares: tax allowance up to a market value of the shares of 125,100 dKr, for a higher market value 28% on capital gains up to 39,700 dKr, 43% for higher capital gains. – [g] 50% of capital gains ("half-income system"), i.e. statutory tax rate 51.2% (Germany) and 20% (Japan). – [h] Top income tax rate. – [i] After two years continuous reduction of tax liable part of capital gains in yearly 5%-steps to 60% after ten years. – [j] Capital gains from government bonds are tax exempt. – [k] Half average income tax rate ("half-tax-rate-system"). – [l] Out of the following two tax rates, the higher one applies: average tax rate resulting from applying the income tax schedule to 50% of capital gains; mean of tax rate. – [m] Capital gains from government bonds and obligations are tax exempt. – [n] 20%/10% final withholding tax between 12 months and 5 years; 18%/8% final withholding tax afterwards (the lower tax rate applies if the other incomes are taxed at the basic tax rate).

Sources: Mennel and Förster (n.y.); Lenain and Bartoszuk (2000); national tax codes.

level. Full imputation systems subject distributed dividends fully to personal income taxation; as corporate income taxes are fully credited against personal income taxes, however, dividends are taxed at the shareholder's personal income tax rate.

Shareholder-relief-systems dominate in the country group examined. The number of countries with a pure classical system (Ireland, Switzerland and the US) as well as with a full imputation system (Finland, France, Italy and Estonia) has decreased in the past.[5] To prevent or at least to restrict tax evasion a number of countries levy a source tax on distributed income which is either credited against personal income tax or operates as final withholding tax. It is striking that almost all CEEC apply relatively low final withholding taxes. In systems without final withholding taxes comprehensive taxation of dividends requires automatic reporting of dividend income to the tax authorities, which, however, has been established in only a few countries.

In pure classical systems the maximum combined statutory dividend income tax rate for the shareholder always exceeds the regular top income tax rate. This also holds for some of the existing shareholder-relief-systems. In contrast to interest income taxation, final withholding taxes do not necessarily reduce the tax burden on dividend income (due to the prior encumbrance with corporate taxes), but may only limit double taxation (e.g. Czech Republic).[6] Only full imputation systems equalise regular income tax and dividend tax rates.

*Taxation of private capital gains*

Table 3 informs about the taxation of private capital gains in the group of countries investigated.

Only a minority of countries leave capital gains fully untaxed. In some countries liability for as well as level of taxation are dependent on the volume of the shares held and/or the duration of the financial engagement. In these cases often only so-called speculative capital gains are taxed. Almost all countries that generally tax capital gains have relatively low final withholding taxes. Automatic

[5] For an overview over the design of corporate income tax systems in the OECD countries in the middle of the 1980s, see Hagemann, Jones and Montador (1987); for the late 1990s see OECD (2001).
[6] Other tax exceptions for capital incomes, e.g. tax allowances or the exemption of certain investments (particularly for old age pension schemes), are neglected.

**Table 4**

**Maximum statutory tax rates in % for different kinds of incomes for residents in Europe, the US, and Japan in 2002**

| | top income tax rate % (1) | interest incomes % | dividend incomes % | capital gains %[a] | mean max. income tax rate on capital incomes[b] % (2) | Diff. (2) – (1)[c] |
|---|---|---|---|---|---|---|
| B | 59.7 | 15[d] | 55.2[d] | 17[d] | 29.1 | –20.6 |
| DK | 59 | 59 | 60.1[d] | 43[d] | 54 | –5 |
| D | 51.2 | 51.2 | 44.2 | 0 | 31.8 | –19.4 |
| FIN | 52.5 | 29[d] | 29 | 29[d] | 29 | –23.9 |
| F | 60.8 | 25[d] | 60.8 | 16[d] | 33.9 | –26.9 |
| GR | 40 | 15[d] | 37.5 | 0 | 17.5 | –22.5 |
| GB | 40 | 40 | 47.5 | 24 | 37.2 | –2.8 |
| IRL | 42 | 42 | 51.3 | 20[d] | 37.8 | –4.2 |
| I | 46.2 | 27[d] | 46.2 | 27[d] | 33.4 | –12.8 |
| LUX | 39 | 39 | 37.9 | 39 | 38.6 | –0.4 |
| NL | 52 | - | 50.9 | 25[d] | 37.8 | –14.2 |
| A | 50 | 25[d] | 50.5 | 25 | 33.5 | –16.5 |
| P | 40 | 20[d] | 44[d] | 0 | 21.3 | –18.7 |
| S | 56 | 30[d] | 49.6[d] | 30[d] | 36.5 | –19.5 |
| E | 48 | 48 | 49.3 | 17[d] | 38.1 | –9.9 |
| *Average EU-15[e]* | *49.1* | *31* | *47.6* | *20.8* | *33.9* | *–15.2* |
| *Median* | *50* | *29.5* | *49.3* | *24* | *33.9* | – |
| *Standard deviation* | *7.4* | *13.3* | *8.2* | *12.7* | *8* | – |
| BG | 38 | 15[d] | 27.8[d] | 10[d] | 17.6 | –20.4 |
| EST | 26[f] | 0 | 26 | 26[d] | 17.3 | –8.7 |
| LV | 25[f] | 5[d] | 22 | 0 | 9 | –16 |
| LT | 33[f] | 15[d] | 39.7[d] | 0 | 18.2 | –14.8 |
| PL | 40 | 20[d] | 38.8[d] | 0 | 19.6 | –20.4 |
| RO | 40 | 10[d] | 2.8.8[d] | 0 | 12.9 | –27.1 |
| SK | 38 | 15[d] | 36.3[d] | 38 | 29.8 | –8.2 |
| SLO | 50 | 50 | 47.5 | 50 | 49.2 | –0.8 |
| CZ | 32 | 15[d] | 41.4[d] | 0 | 18.8 | –13.2 |
| H | 40 | 18[d] | 34.4[d] | 20[d] | 24.1 | –15.9 |
| *Average CEEC [e]* | *36.2* | *16.3* | *34.3* | *14.4* | *21.7* | *–14.5* |
| *Median* | *38* | *15* | *35.4* | *5* | *18.5* | – |
| *Standard deviation* | *7.1* | *12.6* | *7.5* | *17.5* | *10.6* | – |
| CH | 41 | 41 | 55.8 | 0 | 32.3 | –8.7 |
| J | 50 | 20 [d] | 57.9 | 10[d] | 29.3 | –20.7 |
| USA | 44.8 | 44.8 | 66.8 | 18 | 43.2 | –1.6 |
| *Average all [e]* | *44.1* | *26.2* | *44.2* | *17.2* | *29.7* | *–14.4* |
| *Median* | *41.5* | *25* | *45.2* | *17.5* | *30.8* | – |
| *Standard deviation* | *9.2* | *15.3* | *11.3* | *14.7* | *10.7* | – |

[a] For capital gains from financial investment realised after the „speculative" period of time or from long-term financial investment and/or for substantial investment. – [b] Non-weighted mean from maximum statutory income tax rates for interest incomes, dividend incomes and private capital gains. – [c] In percentage points. – [d] Final withholding tax. – [e] Non-weighted average. – [f] Flat tax.

Sources: Federal Ministry of Finance (2002); Martinez-Serrano and Patterson (2003); tables 1, 2, and 3; own calculations.

reporting of capital gains is rarely practised so that capital gains taxes are easily evaded.

*The taxation of capital income in comparison*

Table 4 compares the maximum income tax rates for different types of income in the countries studied.

The average regular top income tax rate of all 28 countries examined (44.1 percent) is markedly higher than the average mean maximum personal income tax rate across the different types of capital income (29.7 percent). The averages of the maximum dividend income tax rate (44.2 percent) and of the regular top income tax rate across countries are almost identical. The interest tax rate and even more the capital gains tax rate, however, are considerably lower on average. A differentiation between EU-15 countries and CEEC shows similar structural characteristics of income tax systems, however on different levels. In the old EU member states the regular top income tax rate (49.1 percent) and the mean of maximum capital income tax rates (33.9 percent) on average are remarkably higher than in the accession (candidate) countries (36.2 percent and 21.7 percent, respectively). Moreover, the relative distance between the mean capital income tax rate and the regular top income tax rate is on average considerably larger in the CEEC than in the established EU member states.

To sum up, a clear trend towards the dualisation of the taxation of labour and capital income can be observed in all countries considered. Throughout the whole country group the regular top income tax rate exceeds the maximum capital income tax rate on average, albeit to a differing extent in the individual countries. This development is not new but has accelerated during the past two decades.[7] It is interesting to note, however, that only Finland has achieved a consistent dualisation of its income tax system, in the sense of a uniform lower and proportional income tax rate on all types of capital income. In all other countries income tax systems are schedular tax systems, which in some cases tax certain types of income – i.e. dividend income – even at a higher rate than labour income. Also those CEEC which do not apply a progressive tax schedule but have introduced a flat tax have schedular income tax systems. Hence the basic principle of a flat tax – to subject (as a comprehensive income tax) all types of income to a uniform and proportional tax rate – is violated. The income tax systems that can be found in the three Baltic States represent a schedular variant of the flat tax.

Of course statutory tax rates do not adequately reflect the effective tax burden resting on the different types of income. Despite remarkable methodological progress made in the literature (see e.g. European Commission 2003 and 2004), it is still not possible to determine either the effective tax burden which different types of income carry and their contribution to total income tax revenues. Thus neither the hypothesis of a shift of the tax burden between different types of (capital) income nor the hypothesis that capital income taxes are losing in significance in the long run can be examined and confirmed empirically. However, it seems plausible to assume that lower statutory tax rates for capital income imply lower effective capital tax burdens compared to labour income.

## Equity and efficiency aspects of low tax rates for capital income

This section identifies some efficiency and equity aspects connected with the existing taxation of (international) capital income and the trends towards dual or schedular income tax systems.

[7] For cross-country comparisons for 1980 and 1990 see Carey, Chouraqui and Hagemann (1993).

*Equity aspects*

The lower taxation of capital income can be regarded as problematic from an equity perspective. As incomes of identical sizes but from different sources may bear differing tax burdens the horizontal dimension of the ability-to-pay-principle is violated. Taxing capital income at a proportional and labour income at a progressive tax rate neglects the vertical dimension of the ability-to-pay-principle. This problem is aggravated by the fact that capital income is generally concentrated at the upper income groups. Particularly in the CEEC, where the tradition to tax personal income is weak, this unequal tax treatment of different types of income may undermine the general tax morale of private households.

These reservations about dual income tax systems usually are countered by two arguments that are also based on equity considerations (Sorensen 1994): First, the phenomenon of cold progression affects capital income more negatively than labour income, which is considered to be less sensitive towards inflation. Second, capital income is subjected to greater risks. However both arguments are not very convincing if the current macroeconomic situation in most countries examined is considered. Both EU-15 countries and accession (candidate) countries have succeeded in containing inflation in the last years. At the same time many established as well as new EU member countries suffer from persistently high unemployment rates, exposing also labour income to considerable risk.

Equity problems also occur within capital income taxation. The majority of the countries studied tax different types of capital income at differing (maximum) income tax rates (see Table 4). In addition some countries (e.g. Italy) do not tax all types of capital income uniformly either at proportional or at progressive rates.

*Efficiency aspects*

Proponents of dualised income tax systems expect them to dampen incentives for international capital flight and tax evasion. In most countries interest income of non-residents ia taxed at relatively low source taxes or not at all so that non-declaration in the investor's residence country (which is made easy by the lack of a system of automatic informa-

tion exchange between countries) can yield substantial tax savings compared to domestic capital investments. In many cases this tax advantage is enlarged by bilateral double taxation agreements which further reduce or even dispense with foreign source taxes. Thus investors from all countries can choose from a quite large menu of potential "tax havens". In some countries (e.g. Luxembourg or Switzerland) they are protected by strict banking secrecy laws. These extensive options for evading interest taxation establish de facto a regime of source taxation for interest income, with the tax burden on foreign interest income being determined by the tax rate of the host country, although in principle foreign interest income are subject to the residence principle, i.e. they have to be fully taxed in the investor's country of residence. Particularly small countries may take advantage of the resulting violation of capital export neutrality and promote their financial markets by offering low or no source taxes, a strategy which can be viewed as a specific form of a "beggar-thy-neighbour-policy" (Giovannini 1989).

The problem of international tax flight is less severe for foreign dividend income which is burdened with corporate income taxes regardless of the investor's residence country. Between certain countries, however, tax differentials may well be significant, taking into account that source taxes on foreign dividends may be reduced or even abolished by double taxation agreements and that most countries do not exchange information on foreign dividend income.

International tax evasion may cause an inefficient international allocation of savings if capital investment is not undertaken in the countries with the highest rate of return before taxes but in the countries offering the highest after-tax rate of return (Carey, Chouraqui and Hagemann 1993). The example of Luxembourg shows that tax flight need not distort international capital allocation if the savings of private households are channelled into the most efficient real capital investment by financial intermediaries (Schratzenstaller and Wehner 2000). However, this requires the existence of a stable financial sector as well as the absence of barriers to capital mobility and currency risks; in this respect some of the CEEC (still) have deficits.

Furthermore, international tax flight violates "inter-nation equity" (Musgrave and Musgrave 1990), i.e. an equitable international distribution of overall capital tax revenues, and reduces overall tax revenues. This is a particularly serious problem for the CEEC where a weak tax administration often contributes to the existing budget imbalances. The existing deficits within tax enforcement in the CEEC (Schaffer/Turley 2001) are a point in favour of final withholding taxes and dualised income tax systems, which, however, may diminish the incentive to improve tax administration.

It must also be considered that dual income tax systems cannot completely eliminate the possibilities and incentives for capital and tax flight. Thus the pressure on capital tax rates remains, which may lead to a mutual downward competition in the long run. Small countries may profit from international tax competition if tax losses caused by tax rate reductions are compensated by additional capital inflows. Many of the old and some of the new member countries, however, undermine – as large countries – their own fiscal basis by decreasing capital income taxes.

Another argument supporting an only moderate taxation of capital income is the promotion of private savings which is justified by the current efforts of most governments to strengthen private old age pension schemes. Tax privileges for capital investment exceeding a certain volume of old age provision, however, are hard to justify from an economic as well as from a political point of view. Moreover, they are problematic from an equity perspective, considering that many countries do not levy separate property taxes any more (Federal Ministry of Finance 2003).

Finally inefficiencies may result from the discrimination between interest and dividend income in the existing income tax systems. In many countries examined maximum interest tax rates are considerably lower than maximum dividend tax rates (see table 4), so that financial neutrality is distorted (Gérard 2002). If as a consequence firms rely too heavily on debt finance, risk allocation may be inefficient, and in times of high interest rates or in recessions firms may not be able to serve their debt obligations. Moreover thin capitalisation may negatively affect firms' willingness to accept high risks that are particularly associated with investment in innovative products and production processes.

## Conclusion

The tendency to introduce dual or schedular income tax systems has seized many western industrialised countries, but also a number of transition countries. It is debatable whether the pros of renouncing comprehensive income tax systems that subject all types of income to a uniform and progressive income tax schedule outweigh the cons. In any case the current harmonisation efforts on the European level aiming at reducing international capital flight seem to be well-founded.

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# International Public Procurement Agreements – Problems of Implementation in Switzerland

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The Government Procurement Agreement (GPA) of the WTO and the Bilateral Procurement Agreement between Switzerland and the European Union prohibit the discrimination of non-local firms. The Swiss legislation interprets the international obligations in a great variety of ways. This causes uncertainty and high transaction costs both for suppliers and purchasing agencies. Moreover, it gives way for rent-seeking by local firms to the detriment of the local tax payers and foreign firms.

In this article, we shall analyse the Swiss public procurement policy under two aspects: welfare economics and public choice. We want to examine whether a federal law should regulate or harmonise the public procurement procedure in order to ensure efficiency and fairness. Our analysis is purely economic. Legal aspects, though very important, are neglected (see Biaggini 2003a and 2003b, Zufferey and Dubey 2003).

In Switzerland, the total amount of public procurement is approximately 25 percent of total public expenditure and 8 percent of GDP. Before the GPA and the Bilateral Agreement became effective (in 1996 and 2002 respectively) public procurement was considered as an instrument of economic promotion. The local, cantonal or national firms were privileged for two reasons: because they create jobs and because they pay taxes. This has changed. Foreign suppliers may not be discriminated any longer. The rationale behind this reform is: intensification of competition, efficiency gains through division of labour and economies of scale, and stronger incentives for innovation. This requires a harmonisation of the procurement rules. The international procurement agreements give the different countries a certain scope when implementing them. Today, in Switzerland there are 27 different procurement laws, one of the Federal Government and 26 of the cantons. The differences regard the threshold values, the award procedures, the selection and evaluation process, the contract conclusion, the terms and conditions of appeal, and the legal protection.

## Welfare Analysis

The main prerequisites for efficiency are: competition, free market entry, low transaction costs, incentives to use economies of scale and to implement innovations. Besides these efficiency conditions in the narrow sense some further aspects have to be taken into account, especially job security, security of supply, social equity, and political acceptance.

### *Competition and free market entry*

Efficient markets require competition, and competition requires free market entry, otherwise scarce resources are wasted, rents are transferred from the consumers to the producers, and innovations are hindered. Whether in reality these disadvantages occur depends on the degree of competition. If a monopoly or cartel exists it must be careful not to attract new suppliers because of high profits (Baumol et al. 1982). Firms prefer to establish or defend a cartelistic situation by bringing government in to protect it. The easiest way to do so is to restrict market entrance for outside competitors by legal measures. In order not to damage their image cartels and the politicians protecting them try to conceal their interests by using good-sounding and already accepted goals such as job security, social and regional equity.

### *Low transaction costs*

The lower the level of information about goods to be provided and firms able to supply them the higher the transaction costs. In the field of public

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The present paper summarises a report on public procurement in Switzerland written for the Federal Government and the Swiss cantons (Frey, Kilchenmann and Krautter 2003 and 2004).

procurement the large variety of rules among cantonal and local jurisdictions leads to legal uncertainty and high transaction costs, not only for the potential suppliers but also for the procurement agencies.

Fully open procurement procedures may raise transaction costs, too. This especially holds for small quantities to be bought. The costs of an open tender can easily exceed its benefits. It is therefore sensible to restrict the international procurement rules to purchases above a certain sum. This limit depends on the kind of goods to be procured (commodity, investment, services, etc.).

With electronic procurement (E-procurement) via Internet transaction costs can be lowered.[1] The online set-up of the complete supply chain should additionally lower the costs (see below). Hence the following conclusion can be drawn: Orders exceeding a certain amount should be subject to a general regulation. Rules trying to satisfy each particular case are not desirable, however. They increase the transaction costs.

*Economies of scale*

For many goods and services average costs decrease with increasing quantities. In the public sector, production within locally and regionally limited boundaries does not allow the firms to benefit from mass production. When firms are allowed to offer not only in their own jurisdiction costs will be lower.

*E-procurement as an innovation*

Market rules should be formulated in a way that the firms are permanently forced to search for new and better solutions. The chance that this will be the case increases with the number of competitors.

An innovation that will revolutionise government procurement is E-procurement. According to the Commission of the European Union 25 percent of all submissions could be treated electronically (Bovis 2001). This means that the entire procurement chain should be processed electronically: the clarification of the demand by the administration departments who plan to place orders with the procurement agency, the call for bids, the positioning of the tender offers, the process of tendering, the composition of the contracts, the contracting, the delivery of the goods and services, the invoicing, the payment, the inventory, and the statistical computation and evaluation. In order to realise efficiency gains from E-procurement, rules and procedures must be harmonised. The local autonomy of the decision makers is not restricted by such a form of technical rationalisation.

The advantages of E-procurement for the different partners is summarised in the following table.

*Other goals*

In the field of public procurement the advocates of locally and regionally limited submission practices sometimes argue that privileging domestic firms is associated with positive pecuniary externalities. As known from welfare economics externalities of this type do not lead to market failure and cannot justify government intervention (Scitovsky 1954). Much more, other goals are addressed as well, such as job security (full employment), the promotion of the local and regional firms (economic growth), the promotion of education and R&D (innovation), equal provision of public services to all groups and regions, social equity, or environmental protection.

At first sight, these arguments seem to be convincing. They involve the danger of high efficiency and growth losses, however. As will be shown in the next section, they often open the floodgates to

**Advantages of E-procurement**

| *Advantages for* | | |
|---|---|---|
| *firms* | *procurement agencies* | *the government* |
| Higher transparency | Saving of time | Easier surveillance of the procurement procedures |
| Cost reductions, benefiting from economies of scale | Cost reductions | Improvement of statistics |
| Less discrimination of SME | Bundling of demand in view of lower prices | Easier detection of protectionist practices |

Source: Bovis 2001, with own additional arguments.

[1] In Switzerland an E-procurement platform already exists (SIMAP, Système d'information sur les marchés publics en Suisse, www.simap.ch). It can be used by federal, cantonal and local public agencies as well as public enterprises.

rent-seeking. The taxpayers have to bear higher charges, whereas the local suppliers benefit from higher sales and profits. In most cases it would be much cheaper to directly subsidise local firms for contributing to one of the public concerns mentioned. Government procurement policy should not be used as an instrument of social, regional or industrial policy.

The international public procurement agreements give every single country a guarantee that all other countries open their markets, too. The winners of such a liberalisation step are the taxpayers and the firms benefiting from mass production. Is this conclusion still correct if some countries do not follow the international procurement rules? In this case the firms cannot fully benefit from economies of scale and long-term innovations. The taxpayers, however, still get a greater return for their contributions.

A policy of retorsion would run counter to the official Swiss position in international relations. Switzerland, as is well known, is very reluctant to accept new binding international agreements. But once they are approved, it is willing to correctly follow all obligations (Hart and Sauvé 1997). It would be a bad example to discriminate foreign competitors, but at the same time to demand open access to foreign markets.

*Competition between jurisdictions*

In democratic societies and market-economies the individual preferences matter. They differ not only between individuals, but also between groups and regions. The same holds for the production costs. Should the local and cantonal governments therefore be autonomous in their procurement decisions in order to take account of the local and regional specialities? The answer is positive as far as it concerns the specifications of procurement – as long as they apply for all competitors. The procurement rules, however, should not be set by the jurisdictions individually. The danger is too great that the politicians discriminate in favour of their own firms.

Our reasoning presupposes that there already exist international public procurement agreements and that they are accepted. If this were not yet the case it would be reasonable to find out the best rules in a kind of interregional or international competition. New solutions could be tested in a single region. If they prove to lead to good results they can be copied by other regions. If they do not, not all regions would have to suffer from the losses.[2]

*Social equity and political acceptance*

Countries which strongly favour efficiency often show large social, sectoral and regional disparities. Not all persons, industries and regions are capable of efficient struggling under conditions of economic competition. There exists a conflict between efficiency and equity. A certain degree of redistribution and/or regulation is necessary, be it for ethical reasons or to make the market system politically acceptable for the majority of the citizens. The question is whether a protectionist procurement policy is a good measure to generate acceptance. It is not. There exist instruments associated with lower efficiency costs.

Procurement agencies can privilege local firms openly or covertly – openly by abandoning an open tender, covertly by formulating requirements which favour local firms and constrain market access of non-local suppliers. Familiarity with the language and the local circumstances, the knowledge of technical and other standards, and the compliance with regional or national rules fall in this category of requirements.

The local collective labour agreements are an example for such requirements. Must foreign competitors sign them? The same question applies for the compliance with industrial safety regulations. An argument in favour of enforcing domestic rules is that the "exploitation" of labour via low wages must be prevented, especially if otherwise local firms are thrown out of the market. The counter-argument runs as follows: Procurement orders to foreign firms imply an import of goods. Many other goods are imported, however, without the foreign producers being forced to sign Swiss collective labour agreements.[3]

Compliance with collective labour agreements is politically highly delicate: When considering the

[2] In the early 1980s, in the United States a contract appeal agency got new rules, The General Services Board of Contract Appeals (GSBCA) got into competition with the older General Accounting Office (GAO). The effect was that the GAO took the appealing firms more seriously and checked the complaints more thoroughly than before. The firms now enjoy a larger palette of legal remedies (Kovacic 1995, 494ss.).

[3] By the way, it can not be ignored that – like Switzerland fights wage dumping – other countries resent the advantage of the low interest rates for Swiss firms compared to companies from other countries.

different arguments, it is reasonable to demand that foreign firms erecting buildings on the Swiss territory comply with the same regulations as Swiss firms do. However, this can not and should not be required of suppliers of other goods and services. There are minimum standards of corporate behaviour which have to be complied with by foreign suppliers, too. The UN Global Compact is such a set of principles to be adopted in public procurement. They concern human rights, labour conditions (the right to be a member of a union, the interdiction of compulsory and child labour, the prevention of discrimination with respect to race, sex, religion, etc.) as well as environmental protection (compare: www.unglobalcompact.org). It can be assumed that the majority of the Swiss population would forbear from buying products which are produced under unacceptable conditions in favour of more expensive products.

**Public Choice Analysis**

Why have liberal procurement rules not been implemented in the past when so many strong points speak against privileging local firms? Public choice theory gives an answer. It assumes that a behaviour based on maximising individual utility is not only characteristic of economic agents (producers, consumers, workers, employers) but also of politicians, bureaucrats, managers of public and private enterprises and representatives of associations. As an analogy to maximising profits by private firms it is spoken of the politicians (and parties) maximising their votes, of the public servants maximising the budget of their agencies, of the public managers maximising their salaries and of the lobbies maximising the rents of their pressure groups (rent-seeking). That does not mean that self-interest prevails at all time. In the following the politico-economic approach (see e.g. Frey and Kirchgässner 2002) will be briefly discussed and applied to public procurement.

*Principal-agent problems and bureaucratic behaviour*

According to the principal agent theory a basic problem with contracts is information asymmetry. The citizens are not able to issue concrete orders to the elected members of parliament and government, and they cannot exactly control whether their orders are carried out exactly according to their will. The same problem occurs in the relation between government and administration.[4]

Whereas citizens and taxpayers have an interest in a good cost-performance ratio, the awarding agencies do not want to be exposed to the risk of contracting with companies whose reputation they cannot judge with the same accuracy as the local competitors. Local companies are often believed to be more reliable. As a consequence, objective aspects (e.g. price or quality) are not always the crucial criteria in the selection of contractors. Procurement agencies are usually risk averse; favouring local suppliers reduces the risk of being accused later of having done a bad job in the case of inadequate delivery or cost explosion (Bohan and Redonnet 1997). Besides this so called "buy-local"-instinct the awarding agencies do not want to jeopardise a good relationship with the local firms simply because of a one-time profit. Risk aversion can also be explained with the presumption that local companies left out are more likely to take legal actions (Bohan and Redonnet 1997, 154). On the other hand, it can be assumed that firms are often reluctant to criticise the procurement agencies. By doing so they would endanger future orders (Arrowsmith 1996).

*Rent-seeking and lobbyism*

Even without alleging favouritism, the government, the civil service and the procurement agencies tend to equate their welfare with that of the local firms. They feel bound to maintain local jobs, to foster local technology or to ameliorate the trade balance (Martin and Hartley 1997).

If regional firms can be confident of receiving all orders of their jurisdiction this gives rise to the risk of collusion. This is facilitated by the fact that most of the local entrepreneurs and managers know each others. They can either hamper the entrance of new competitors or cooperate with them in view of higher prices and a handsome producer surplus. Until recently, the Swiss anti-trust law did not allow to combate bidder cartels effectively. Such cartels are typically "ad hoc cartels", whereas anti-trust regulation only applied to recurrence. Meanwhile, a new law has been enacted. It will be interesting to see whether it will have an effect on public procurement, too.

[4] The first economists who dealt with that so called "Principle-Agent-Problem" were Jensen and Meckling (1976). A good survey of the status quo is provided by Barberis, Shleifer and Vishny (1998).

According to Olson (1965) and other scholars of public choice it is much easier for the producers to organise their interests in a powerful way than for the consumers, the taxpayers or the citizens. This is due to the fact that the number of suppliers of a certain commodity is small and their interests are relatively homogeneous. Not so for the consumers, taxpayers and citizens. Their interests are heterogeneous. The single person is only marginally affected by protectionist measures. There is little incentive to form a countervailing power to the suppliers' interests.

Another problem, which does not directly affect the bureaucracy and the interest groups, but rather the democratic process as such, is the restriction of re-election, which the parties and politicians are subjected to. Particularly in small political jurisdictions the entrepreneurs, their relatives and employees account for a decisive part of the entire voting public. Politicians and parties increase their political power by privileging the local firms and restricting the number of competitors in the government procurement process.

**Conclusions for the Swiss Procurement Policy**

We know from economic theory that good rules are essential to guarantee that the great number of economic decisions taken independently leads to an efficient use of scarce resources. This also holds for public procurement. Here the following rules are important (Mattoo 1996, Bohan and Redonnet 1997, Anechiarico and Jacobs 1995, Kovacic 1995):

- Public contracts have to be advertised internationally for bids exceeding a certain amount.
- The specifications have to be transparent.
- Discrimination of non-local suppliers is improper.
- The submission has to make clear all requirements potential suppliers have to meet.
- The suppliers must have some scope to introduce new solutions.
- Discretion regarding sensitive information has to be granted.
- The rules of procurement have to be enforced, and loopholes must be avoided.
- Firms that want to take legal action must have access to an impartial judge.

Our analysis of Swiss public procurement policy has shown that efficiency and welfare losses can turn up in two fields: in connection with the procurement law and in connection with the procurement practice, i.e. the application of the legal regulations.

*Procurement law*

In Switzerland, the reasons for efficiency losses on the legal level are mainly twofold:

(1) The great variety of rules and regulations lowers transparency and increases the information and transaction costs. The correct application of the law and its supervision become difficult. These problems regard much more the procurement agencies than the firms. The awarding agencies have a tough time negotiating their way through the jungle of today's regulatory diversity, conducting correct submissions and preventing complaints against their decisions. If they neglect the details they risk to get into trouble when, afterwards, the losing competitors oppose the final decision. The clearer the submission prescriptions formulated by the procurement agencies the easier the job for the offering firms. These prefer uniform forms (paper version) and input masks (Internet version).

(2) Legal rules and regulations cannot be formulated explicitly enough to be applicable to each case. This is especially true for orders which cannot be standardised. Too much detail in rules and guidelines may create rigidities and impede innovations.

The revision of the procurement law should take into account the following points:

- *Threshold values*: The observed variety of threshold values is confusing both for procurement agencies and firms. Threshold values should reflect the fix cost associated with an open tender which is approximately the same across jurisdictions, but not different levels of preferential treatment of local suppliers. Harmonisation or minimal standards (i.e. maximal values) are desirable.
- *Award procedures*: The leeway for applying open, selective and limited procedures should be narrowly defined by law.
  *Submission and publication*: The existing rules already allow public submissions to be carried out via Internet. On a long-term basis, a legal harmonisation would facilitate E-Procurement, too.

- *Selection criteria*: The freedom of the local and cantonal jurisdictions to formulate specific conditions regarding the qualification of the suppliers and the services offered should be restricted. They can easily be misused for protection purposes.
- *Contract conditions*: The guiding principle of imposed conditions must be equal treatment of all suppliers, local and foreign.

*Procurement procedures*

In Switzerland, the main problem of public procurement consists in the persistence of "old habits". It is a widely held view that local firms as employers and taxpayers must be protected against foreign competitors. Therefore, it is not surprising that the WTO-rules are still not implemented as they should. This is not so much a problem of the procurement law as such, but rather of its application. Consequently, the emphasis should be on a better implementation of the national and cantonal procurement rules. This requires a simplification of the procurement rules in order to increase transparency and create adequate surveillance mechanisms.

- *Monitoring*: The surveillance of the formal compliance with the international and national procurement rules and their interpretation in the sense of competition, transparency, non-discrimination and efficient use of resources must be cost-effective and fast. It must also have a preventive effect. It is up to the lawyers to find adequate ways and means to ensure the correct application of the law. From the economic point of view the creeping development of a big bureaucracy must be avoided and innovations must be encouraged.
  Possible solutions are:
  – formal judicial control, spot-checks by administrative and financial control agencies, the surveillance by the monopoly commission etc.
  – public announcement of "sinners".
  – disclosure of procurement facts (e.g. statistics) so that third parties (media, researchers etc.) can reveal grievances. The E-procurement platform SIMAP could operate in the same direction as it publishes not only the invitations to bid but also the awards of bids.
  – installation of an ombudsman. He or she could collect notifications of infringement or unequal treatment and try to create a counterbalance to the interests of the local suppliers.
- *Incentives to comply with efficiency*: The efficient behaviour must be made advantageous to all parties involved in the procurement process. Good results have been realised by general contractors who, instead of government agencies, are responsible for the submission and the evaluation of the tender. General contractors can accumulate a specific knowledge and they are less subject to political pressure. Last but not least, blunders and misuse are penalised by insolvency whereas government agencies do not have to worry about their existence.
- *Rights of appeal and complaint*: Firms (and persons) experiencing severe losses because of an incorrect application of legal norms should have the possibility to take legal action. The problem is that the citizens and taxpayers as aggrieved parties are not conscious of their losses and are not authorised to complaint today. Furthermore, even for firms the cost-benefit ratio of a formal opposition is often negative. A simpler, faster and less costly procedure is needed.
- *Control of effectiveness and efficiency*: As in other policy areas, a systematic review of the procurement activities on all levels of government should be organised from time to time. The results could serve as a background for further improvement of the government procurement policy and practice.

*How much harmonisation?*

At the moment, the federal government and the cantons are preparing a reform of the public procurement law. Four reform models are being evaluated (Biaggini 2003a):

- The revision of the existing *intercantonal treaty* (Konkordat) does not go far enough. It leaves too wide a scope to the cantons and to the local jurisdictions for discrimination against foreign competitors. And it takes too much time, making the quick realisation of efficiency gains from E-procurement unrealistic.
- A new *federal law formulating guidelines* (Bundesrahmengesetz) for the subnational legislation cannot solve the problems detected, either. The deficiencies are not primarily due to lacking legal norms but to their application in practice. The opening of the markets and the equal treatment of all competitors must be enforced.
- A *partial harmonisation* of the procurement policy in a new federal law would be the best solu-

tion. It would allow the harmonisation of the technical aspects necessary for E-procurement and could enforce the factual opening of the procurement markets without intervening too much into the local autonomy apt to take into consideration specific local circumstances.

- The *complete harmonisation of the procurement law* via a new federal law is not necessary. Such a solution would infringe the principle of subsidiarity and provoke a strong opposition by the cantons.

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# The Impact of Environmental Regulation on Competitiveness in the European Cement Industry – Results of a Matched Plant Comparison Between Germany, Spain and the UK*

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## Introduction: Environmental regulation and competitiveness

Essentially, there are two opposite views on the impact of environmental legislation on competitiveness. The traditional view fears that private costs initiated through stringent environmental policy impair competitiveness and productivity (Palmer et al. 1995). Conversely some commentators have argued that environmental regulation spurs innovation in a number of ways and that there are "win-win" opportunities available through environmental regulation, where simultaneously pollution is reduced and productivity increased ("Porter hypothesis" or revisionist view, Porter and van der Linde 1995). The differences between the traditional and the revisionist views can only be measured in empirical studies.

In general terms, a negative impact on the output and employment of firms will be stronger the larger the rise in costs following compliance, the greater the differential cost penalty relative to domestic and foreign competitors, the more significant the compliance costs are in total costs, the greater the degree of price competition between firms and the greater the sensitivity of demand to price increases (OECD 1993). Empirical studies taking labour productivity as the main indicator of competitiveness and firm performance come to at least mixed findings concerning the relationship between environmental regulation and competitiveness (Stewart 1993; Gray and Shadbegian 1995; Repetto 1995; Boyd and McClelland 1999). Clear proof of the Porter hypothesis is scarcely found (one example would be Murty and Kumar 2001). One shortcoming found in all the studies is that no systematic search for the impact of the type of environmental abatement measure was undertaken. In most cases the impacts of end-of-pipe technologies were measured, but not those of process-integrated or clean technologies. It should also be noted that much of the evidence has been US based, with only little attention paid to the European case.

Therefore this research was designed to cover the impact of European environmental policy and to examine not only the effects of end-of-pipe technology, but also those of clean technology. The cement industry was chosen because the sector is known to bear significant costs of environmental compliance.[1] German data were contrasted with those in similar (matched) firms in the UK and Spain, where national clean air regulation in the area of dust, $SO_2$ and $NO_x$ emissions is still less stringent (see Tables 1 and 2 for an overview of clean air regulation in the European Union, EU 15). Especially the German national dust and NOx emission limits both for new and existing plants are among the most stringent emission limit values in the EU. The German NOx limits are 500 mg/Nm3 for new installations and 800 mg/Nm3 for existing installations. In comparison, Spanish legislation is in many provinces still quite soft. In 1998 Spanish NOx emission limit values were still fixed between 2400 and 6000 mg/Nm3. However, there is tremendous regional variation in Spain with a tendency in the North of being more progressive than in the South. In the UK permits are given on a plant by plant basis. Any emission limit values are understood as benchmark values, i.e. they are among

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[1] In Germany in the year 2000 average environmental investments amounted to about 3.3 percent of all investments in the cement industry. Average environmental investments in the German manufacturing industry only amount to 3 percent of all investments (Wackerbauer 2002).

**Table 1**

**National dust emission limits for the production of cement within the European Union (EU 15), in mg/Nm³, around 2000**

| | Data based on | New/modified or existing plant | Kiln stack | Clinker cooling | Cement grinding | Other point sources |
|---|---|---|---|---|---|---|
| Austria | Na[a)] | new/modified | 50 | 50 | 50 | 50 |
| | | existing | 50 | 50 | 50 | 50 |
| Belgium | P | new/modified | 50 | 50 | 50 | |
| | | existing | 50–150 | 50–400 | 50–150 | 50–300 |
| Denmark | P | existing | 50[b)] | 50[b)] | 50[b)] | 50[b)] |
| Finland | P | new/modified | 50 | 50 | 30–50 | 30–50 |
| | | existing | 50[c)] | 50 | 30–50 | 30–50 |
| France | Na | new/modified | 50 | 100 | 50 | 30 |
| | | existing | 50[d)] | 100[d)] | 50[e)] | 30 |
| Germany | Na | new/modified | 50 | 50 | 50 | 50 |
| | | existing | 50 | 50 | 50 | 50 |
| Greece | Na/R | new/modified | 100 | 100 | 100 | |
| | | existing | 150 | 150 | 150 | |
| Ireland | Na | new/modified | 50 | 100 | 75 | 50 |
| | | existing | 50 | 100 | 75 | 50 |
| Italy | Na/P | Existing | 50 | 50 | 50 | 50 |
| Luxembourg | P | Existing | 30[f)] | | | |
| Netherlands | P | Existing | 15[f)] | 10[f)] | 10[f)] | 10[f)] |
| Portugal | Na | new/modified | 50 | 100 | 75 | 50 |
| | | existing | 100 | 100 | 75 | 50 |
| Spain | Na | new/modified | | 170/100[g)] | 300/250[g)] | 300/250[g)] |
| | | | | 100[h)] | 75[h)] | 50[h)] |
| | | existing | 400/250[g)] | 170/100[g)] | 300/250[g)] | 300/250[g)] |
| | | | 100[h)] | 100[h)] | 75[h)] | 50[h)] |
| Sweden | P | Existing | 50 (i) | 50 | 50 | 20 |
| United Kingdom | Na[j)] | new/modified | 40[k)] | 50[k)] | 40[k)] | 50[k)] |
| | | existing | [l)] | [l)] | [l)] | [l)] |

Na = National law; R=Regional law; P=Typical permit; in mg/Norm m³.
[a)] Daily averages and reference condition of 273 K, 101.3 kPa, dry gas and 10% $O_2$. – [b)] Limits under discussion. Reference condition of 273 K, 101.3 kPa, dry gas and 10% $O_2$. – [c)] Existing plant must meet 50 mg/Nm³ by January 1, 2001. Monthly averages and reference condition of – [d)] 10% $O_2$ and dry gas. – [e)] Existing plant with emission <150 mg/Nm³ must meet limit for new plant by 2001. – [f)] Existing plant must meet limit for new plant by 2001. – [g)] Daily average values. – [h)] Current limits. – [i)] Limits under discussion. – [j)] Daily average value. A limit value of 90 mg/Nm³, including start/stop and CO-trips, applies for monthly averages. – [k)] IPC Guidance Note S2 3.01. – [l)] Benchmark releases. Benchmark releases are, in particular, not applicable to existing plant but are a factor in considering appropriate limits.

Source: EIPPC Cement BREF (2000). Based on Cembureau report (1997) and information provided by experts of the Technical Working Group set up in order to support the production of the BREF.

the strictest in the industry, but are not applicable for existing plants.

Furthermore, the cement industry is a very energy-intensive industry. As a result waste (e.g. tyres, rubber, paper waste and sludge) has been used as a fuel in this industry for more than 10 years and to varying degrees in the Member States of the European Union. The burning of these alternative fuels is more widespread in Germany than in the UK and Spain. In all countries it made necessary additional maximum emission limits for heavy metals.

## Research method, sample selection, main hypothesis and measurement of competitiveness impacts

### *Matched plant technique*

The central aim of this research is to examine whether different levels of environmental strin-

**Table 2**

**National $SO_2$ and $NO_x$ emission limits for the production of cement within the European Union (EU 15), in mg/Nm³, around 2000**

| | Data based on | New/modified or existing plant | $SO_2$ normal situation | $SO_2$ S-rich raw materials | $NO_x$ | PCDD/Fs* ng TEQ/Nm³ |
|---|---|---|---|---|---|---|
| Austria | Na[a)] | new/modified<br>existing | 200<br>200 | 400<br>400 | 500<br>1000 | |
| Belgium | P | new/modified<br>existing | 1000<br>1000 | | 1800<br>1800 | |
| Denmark | P[a)] | existing | 5/250/450[b)] | no limit | 1200/2500/850[c)] | no limit |
| Finland | P[d)] | existing | 150–400 | | 1200–1800 | |
| France | Na | new/modified<br>existing | 500<br>500(e) | 1200/1800[f)]<br>1200/1800[e)f)] | 1200/1500/1800[g)]<br>1200/1500/1800[g)] | |
| Germany | Na | new/modified<br>existing | 400<br>400 | 400<br>400 | 500<br>800 | |
| Greece | | | | | | |
| Ireland | Na | new/modified<br>existing | 400<br>400 | 700<br>700 | 1300<br>1300 | n.a.<br>n.a. |
| Italy | Na/P | new/modified<br>existing | <br>600 | | <br>1800 | 10000[h)]<br>10000[h)] |
| Luxembourg | P | existing | 100[i)] | | 800[j)] | 0.1[k)] |
| Netherlands | P | existing | [l)] | | 1300[j)] | 0.1 |
| Portugal | Na | new/modified<br>existing | <br>400 | | <br>1300 | 0.1<br>0.1 |
| Spain | Na | new/modified<br><br>existing | 2400/6000[m)]<br>600[n)]<br>2400/6000[m)]<br>600[n)] | 2400/6000[m)]<br>1800[n)]<br>2400/6000[m)]<br>1800[n)] | <br><br>1300-1800[n)] | |
| Sweden | P | existing | - | <200 | <200 | 0.1 |
| UK | Na[o)] | new/modified<br>existing | 200[p)]<br>[q)] | <br>600-2500[r)] | 900[p)]<br>500-1200[q)s)] | |

Na = National law; R=Regional law; P=Typical permit; in mg/ Norm m³.
* Polychlorinated dibenzo dioxins and furans (total emitted quantity in nano g/ Norm m³).
[a)] Daily averages and reference condition of 273 K, 101.3 kPa, dry gas and 10% $O_2$. – [b)] 5 for semi-dry process, 250 for wet process and 450 for wet process with wet scrubber and heat recovery. Limits under discussion. – [c)] 1200 for semi-dry process, 2500 for wet process and 850 for wet process with wet scrubber and heat recovery. Limits under discussion. – [d)] Monthly averages, reference condition of 10% $O_2$ and dry gas. – [e)] Existing plant must meet limit for new plant by 2001. – [f)] 1200 mg/Nm³ if ≥ 200 kg/h; 1800 mg/Nm³ if < 200 kg/h. – [g)] 1200 mg/Nm³ for dry process with heat recuperation, 1500 mg/Nm³ for semi dry and semi wet processes, and 1800 mg/Nm³ for wet and dry processes without heat recuperation. – [h)] General rule for any kind of industrial emission. – [i)] Half hour average. – [j)] Daily average value. [k)] 6 hour average. – [l)] 90 kg/h as daily average, maximum 375 tonne/year. – [m)] Current limits. – [n)] Limits under discussion. – [o)] IPC Guidance Note S2 3.01. – [p)] 'Benchmark releases'. – [q)] Benchmark releases are, in particular, not applicable to existing plant but are a factor in considering appropriate limits. – [r)] Limit values reflect the actual levels of releases. Daily averages and reference condition of dry gas and actual $O_2$ content. – [s)] Actual releases, daily averages, not all plants currently have limits.

Source: EIPPC Cement BREF (2000). Based on Cembureau report (1997) and information provided by experts of the Technical Working Group set up in order to support the production of the BREF.

gency have an impact on competitiveness. For a robust testing of the potential effects of environmental regulation on competitiveness in the cement industry the need for a detailed compilation of empirical data was recognised. The matched plant comparison was selected as research method; it is an interview-based sample survey technique which is comparable to a benchmarking exercise (e.g. Hitchens et al. 1990 and 1993; Mason et al. 1994; for an extension to questions of environmental economics, see Hitchens et al. 1998, 2000, 2001). It systematically compares supply-side features of the firm after controlling for size, ownership and product type. While no formal model is used for the specification of a production function, the technique has yielded robust measurements of the importance of a range of factors influencing relative competitiveness in a variety of industries across the EU.

The technique allows access to sometimes confidential data on environmental costs and economic performance. This is particularly important since the focus of the study was on the cost and environmental effects of clean technology solutions which are not covered in the census data. Between May 1999 and April 2000 18 interviews were undertaken in dry process cement plants in Germany, Spain and the UK. Access to additional information on

**Table 3**

**Overview about pollution reduction techniques for the cement industry and its environmental and economic effects**

| | Kiln systems applicability | Reduction efficiency | Reported emissions mg/m³ [a] | Reported emissions kg/tonne [b] | Reported costs [c][g] Investment | Reported costs [c][g] Operating |
|---|---|---|---|---|---|---|
| $NO_x$ Reduction techniques | | | | | | |
| Flame cooling | All | 0–50% | 400– | 0.8– | 0.0–0.2 | 0.0-0.5 |
| Low-$NO_x$ burner | All | 0–30% | | | 0.15–0.8 | 0 |
| Staged combustion (MSC) | Precalciner | 10–50% | <500–1000 | <1.0–2.0 | 0.1–2 | 0 |
| | Preheater | | | | 1–4 | 0 |
| Selective non-catalytic reduction (SNCR) | Preheater and Precalciner | 10–85% | 200–800 | 0.4–1.6 | 0.5–1.5 | 0.3–0.5 |
| Selective catalytic reduction (SCR) – data from pilot plants only | Possibly all | 85–95% | 100–200 | 0.2-0.4 | ca. 2.5 [d]<br>3.5–4.5 [e] | 0.2–0.4 [d]<br>No info. [e] |
| $SO_2$ reduction techniques | | | | | | |
| Absorbent addition | All | 60-80% | 400 | 0.8 | 0.2–0.3 | 0.1–0.4 |
| Dry scrubber | Dry | up to 90% | <400 | <0.8 | 11 | 1.4–1.6 |
| Wet scrubber | All | >90%t | <200 | <0.4 | 6–10 | 0.5–1 |
| Activated carbon | Dry | up to 95% | <50 | <0.1 | 15 [f] | no info. |
| Dust reduction techniques | | | | | | |
| Electrostatic precipitators | All kiln systems<br>clinker coolers<br>cement mills | | 5–50<br>5–50<br>5–50 | 0.01–0.1<br>0.01–0.1<br>0.01–0.1 | 2.1–4.6<br>0.8–1.2<br>0.8–1.2 | 0.1–0.2<br>0.09–0.18<br>0.09–0.18 |
| Fabric filters | All kiln systems<br>clinker coolers<br>cement mills | | 5–50<br>5–50<br>5–50 | 0.01–0.1<br>0.01–0.1<br>0.01–0.1 | 2.1–4.3<br>1.0–1.4<br>0.3–0.5 | 0.15–0.35<br>0.1–0.15<br>0.03–0.04 |
| Fugitive dust abatement | All plants | | – | – | – | – |

[a] Normally referring to daily averages, dry gas, 273 K, 101.3 kPa and 10% $O_2$. – [b] kg/tonne clinker: based on 2000 $m^3$/tonne of clinker. – [c] For $No_x$ and $SO_2$: investment cost in $10^6$ Euros and operating cost in Euros/tonne of clinker, normally referring to a kiln capacity of 3000 tonne clinker/day and initial emission up to 2000 mg $NO_x/m^3$. – [d] costs estimated by Ökopol for a full scale installation (kiln capacities from 1000 to 5000 tonnes of clinker/day and initial emissions from 1300 to 2000 mg $NO_x/m^3$), operating costs ca. 25% lower than for SNCR. – [e] Costs estimated by Cembureau for a full scale installation. – [f] This cost also includes an SNCR process, referring to a kiln capacity of 2000 tonne of clinker/day and initial emission of 50-600 mg $SO_2/m^3$. – [g] For dust: investment cost in $10^6$ euros and operating cost in euros per tonne of clinker for reducing the emission to 10-50 mg/$m^3$, normally referring to a kiln capacity of 3000 tonne clinker per day and initial emission up to 500 g dust/$m^3$

Source: EIPPC Cement BREF (2000).

profitability, which was necessary for the estimation of competitiveness effects in the cement industry, was made possible during later interviews with headquarter offices in November 2000.

*Sample selection and classification according to environmental criteria*

The size distribution and the environmental performance of sample plants should be representative of the industry in each country. To control for this factor the size distribution and the environmental performance of the sample was cross-checked with national statistics.

From the eight plants visited in Germany six were located in West Germany and two in East Germany. The latter plants were visited in order to consider the special situation in East Germany, where after the German reunification cement plants have been rapidly modernised with high capacity dry kilns. From the five Spanish plants three were located in Andalusia, one close to Madrid and one in Catalunia. The five UK plants were located throughout the country.

Sample plants were matched by size and environmental category. It was possible to gain access to detailed data on the emission situation of sample plants visited in Germany, Spain and the UK. This had an impact on the analytical approach insofar as a concise classification of the cement sample according to environmental parameters was possible. Within this framework it was possible to ask the question whether the top environmental performers were economically any different from their counterparts with a lower environmental performance. As a background for the interviews a recently published list of best available technologies (BAT) for the cement industry was used (EIPPC Cement BREF,

**Table 4**

**Number of cement plants in different environmental categories and size classes* in the sample**

| Environmental category | Germany | | Spain | | UK | |
|---|---|---|---|---|---|---|
| | No. of plants | Size class | No. of plants | Size class | No. of plants | Size class |
| **Group 1:** | | | | | | |
| Low emissions and medium number of env. measures | 1 | Small | 0 | – | 1 | Large |
| Low emissions and high number of env. measures | 1 | Large | 0 | – | 0 | – |
| **Group 2:** | | | | | | |
| Medium emissions and low number of BATs | 0 | – | 0 | – | 1 | Large |
| Medium emissions and medium number of BATs | 1 | Medium** | 1 | Small | 1 | Medium |
| Medium emissions and high number of BATs | 5 | 4 Medium***, 1 Large | 0 | – | 0 | – |
| **Group 3:** | | | | | | |
| High emissions and low number of BATs | 0 | – | 2 | 2 Large | 0 | – |
| High emissions and medium number of BATs | 0 | – | 2 | 2 Medium | 2 | 1 Large, 1 Medium |
| Total number of plants | 8 | | 5 | | 5 | |

* Size classes are defined as follows: small size: < 600,000 tonnes of cement per year; medium size: 600,000 – 1,000,000 tonnes of cement per year; large size: > 1,000,000 tonnes of cement per year. – ** This plant has remarkably lower emissions than the average of all medium-sized plants. – *** One of these plants has remarkably lower emissions than the average of all medium-sized plants. These two marked medium-sized plants required a further differentiation of group 2 later on and were analysed in a group called group 2a, whereas the other three medium-sized plants are called group 2b. For ease of illustration group 2b also includes the remaining large plant of group 2 with average emissions.

2000; see Table 3 for an overview of abatement technologies and their expected effects). This list was developed as a reference document for the European cement industry within the framework of the Council Directive 96/61/EC on integrated prevention and pollution control (IPPC). During the interviews it was asked which of the possible technologies for $NO_x$, $SO_2$ and dust abatement were implemented in sample plants and what were their exact economic and environmental effects.

Both clean technology measures and end-of-pipe technologies were examined. With respect to the total number of environmental initiatives, it became evident that German sample plants clearly undertook more activities than their counterparts in the other sample countries. The analysis of emission data revealed that, on average and as expected, German plants had the lowest dust and $NO_x$ emissions. Lowest $SO_2$ emissions were found in the Spanish sample. The number and type of clean air initiatives (process-integrated or end-of-pipe) together with the actual emission levels served as a classification model for the environmental quality of sample plants. A total of 18 cement sample plants were divided in three groups of different environmental quality (see Table 4). As expected, German plants fell into the groups with higher environmental quality (two plants in group 1 and six in group 2). Four of the five Spanish plants were classified as group 3 performers. In the UK sample plants were to almost even parts both group 2 and 3 performers.[2]

The number of individually matched pairs is shown in Table 5. A full set of comparisons was possible between Germany and Spain; due to the lack of small sample plants in the UK no comparison of small British and German plants was possible.

*Main hypothesis and measurement of competitiveness impacts*

The main hypothesis was that the proportional cost of environmental compliance relative to turnover

[2] Two of the medium-sized plants in the German group 2 have remarkably lower emissions than the average of all medium-sized plants. These two medium-sized plants required a further differentiation of group 2 later on and were analysed in a group called group 2a, whereas the other three medium-sized plants are called group 2b. For ease of illustration group 2b also includes the remaining large plant of group 2 with average emissions (see results presented in Tables 7 and 8).

incurred by the firms is likely to be a negative function of the productivity level. This is supposed to hold because firms with the capability of achieving high productivity will also find it easiest to implement environmental initiatives and high environmental performance without the penalty of reduced output and employment (Hitchens et al. 1998, 2000, 2001). To this end it was measured through which abatement initiatives cement plants in Europe have adjusted to varying levels of environmental regulation, why they were put in place (legislation vs market driven measures), at what costs and how their competitiveness was affected. Information on the impact of environmental measures on overall profitability was obtained. Moreover, general competitive advantages and disadvantages were put in relation to the impact resulting from environmental regulation.

**Table 5**

**Number of individually matched pairs in the cement sample***

| Size | Germany : Germany | Germany : Spain | Germany : UK |
|---|---|---|---|
| Small | – | 1 : 1 | – |
| Medium | 2 : 3 | 5 : 2 | 5 : 2 |
| Large | 1 : 1 | 2 : 2 | 2 : 2 |
| Total | 3 : 4 | 8 : 5 | 7 : 4 |

* First number always refers to plants in higher environmental category than second number.

## Factors influencing competitiveness in the European cement industry

Cement is a binding agent and important building material. It consists mainly of calcium (normally limestone), silica, alumina and iron ore. It is made by quarrying, crushing and grinding raw materials, burning them in huge rotary kilns at high temperatures and finely grinding the resulting clinker with gypsum into an extremely fine, usually grey, powder. There is a wide variety of cements, but each type is standardised to agreed norms. Cement quality standards are relatively easy to meet and the product is internationally competitive. While there are about 250 cement plants in the EU, there has been much consolidation of the industry through merger and acquisition since the 1970s. Technology of kilns has changed to the dry technology with cyclone preheaters. This has gone along with an increase in capacity and greatly improved energy efficiency. Today, the minimum optimal size (MOS) for a kiln is considered to be 3,000 tonnes per day (Wagner and Vassilopoulos 2000). Up to this size the unit costs decrease, if capacity is fully utilised. Concentration of production in the industry is high. The market share of the three largest manufacturers in Germany, Spain and the UK is 48 percent, 56 percent and 94 percent respectively (Dresdner-Kleinwort-Benson Research 1998).

Cement is a heavy, low unit price product and transport costs are an important factor for the producer's customer base (Dumez and Jeunemaître 2000). Most cement is delivered by road and in Western Europe transport costs usually limit supply to a radius of 200 km. Cheap rail freight and low production costs have led to imports from Eastern Europe and elsewhere by sea. Transport by water is cheap and, once handling charges are paid, distance matters little. Cement prices at ports are often lower than inland (the difference can be as much as 20 percent). Quantity-wise imports from South East Asia to the EU still play a minor role[3], but they influence the prevailing prices and can induce national cement manufacturers to offer considerable price discounts. The prices for these cement imports were said to be about EUR 10 cheaper than the prices at national European ports[4]. Despite this threat from imports, customer need for just-in-time deliveries of cement of uniform quality limits competition (see Hitchens et al. 2002).

## Sample description according to economic and environmental criteria

Within the countries under consideration for this case study the German cement industry is the largest producer in terms of number of plants, employees and total production (see Table 6 below). Spain takes the top ranking with respect to labour productivity measured as annual output per employee.

Since about 70 percent of variable costs in cement production are incurred by energy and electricity costs, this factor receives greatest attention for cost

[3] Imports from Asia (South East Asia, Saudi Arabia, Turkey and Lebanon) to Belgium and the Netherlands in the first 10 months of 2000 amounted to 600,000 tonnes cement. Prices were about 20 percent below market price. Information by Cembureau, Brussels.
[4] Interviews in November and December 2000 with chief executives of participating cement companies.

**Table 6**

**Comparison of German, Spanish and UK cement industry according to economic and environmental criteria**

| Most recent year available | Country | | |
|---|---|---|---|
| | Germany 1999 | Spain 1997 | UK 1998 |
| No. of plants | 66 | 43 | 22 |
| Employees | 11,372 | 5.464 | 5,000 |
| Production cement (1,000 t) | 36,000 | 27,933 | 12,409 |
| Tonnes of cement/employee | 3,105 | 5,112 | 2,482 |
| Energy consumption (kcal/kg clinker) | 715 | 844 | 1,000 |
| Electricity (kWh/t cement) | 108 | 106 | 112 |
| Import of cement (1,000 t) | 4,466 | 3,044 | 1,300 |
| Export of cement (1,000 t) | 2,929 | 5,572 | 600 |
| Import – Export | 1,537 | –2,528 | 700 |

Sources: Bundesverband der Deutschen Zementindustrie e.V. (1998 and 2000); British Cement Association (1998) and Oficemen (1997).

reduction (see Chacko and Shenoy 1997). This is also important from an environmental perspective since $CO_2$ emissions can be reduced. Germany shows the lowest energy consumption in the sample. Electricity consumption has been increasing from 80 kWh/tonne cement in 1960 to 110 kWh/tonne cement in 1990 in the West German cement industry (see Wagner and Vassilopoulos 2000). In the sample for Germany an average of 108 kWh/tonne was measured at the end of the 1990s. Included among the reasons for the increase in electricity consumption are a higher use of electricity for environmental equipment, finer grinding of cement, particularly of composite cement, and a more automatic process. Since cement milling requires the largest share of electricity, special efforts are taken to improve the cement mills. In the sample there are no big variations concerning electricity consumption. From the sample countries Spain is the only country which exports more than it imports.

## Sample results: Measuring the impact of environmental regulation on competitiveness

In this section the results on the impact of environmental legislation on competitiveness in the selected sample of cement plants in Germany, Spain and the UK are presented. To this end data on output and input measurements of competitive performance were linked with the environmental performance on a matched pairs basis. The environmental performance is already captured in the classification of plants as group 1, 2 or 3 performers (emission levels and numbers of environmental initiatives were the decisive criteria for the classification). As output indicators of competitive performance data on productivity, capacity utilisation, production costs, sales and prices were used. Input measurements of competitive performance mainly consisted of age of kiln, skills and investment levels. Furthermore, environmental and economic performance were put in relation to the level of compliance costs measured as environmental investment. Finally, the influence of other company characteristics like ownership and the use of alternative fuels on the relationship between competitiveness and environmental performance was examined.

*Output indicators of competitiveness and environmental performance*

The German plants with low emissions and many pollution abatement measures classified as group 1, and 2 performers showed in some respects a better economic performance than their national and/or foreign counterparts with less favourable environmental performance, but not in all aspects. Productivity and environmental performance were not always positively correlated. Table 7 indicates that the small German plant in group 1 has a higher productivity than the small counterpart in group 2 in Spain. Within Germany the large plant in group 1 also shows a higher productivity level than an equally large plant in group 2b. The same is true for large plants in the German/British comparison. However, amongst the medium-sized plants the German plants in group 1 and group 2a never reach the productivity level of their counterparts in group 2b within Germany. Moreover, all medium-sized German plants are with 8,700 tonnes of output per employee and year less productive than their Spanish and UK counterparts of the same size with higher emissions (9,100 and 11,300, respectively).

Productivity is closely related – among other factors like labour intensity – to capacity utilisation. The rate of capacity utilisation in the German plants has

**Table 7**

**Average productivity in tonnes of cement per employee and year[a] in the sample**

| Env. category | Germany<br>Average of group 1 and 2a | Germany<br>Average of group 2b | Germany<br>Average of group 1 and 2 (total) | Spain<br>Average of group 2 and 3 | Germany<br>Average of group 1 and 2 (total) | UK<br>Average of group 2 and 3 |
|---|---|---|---|---|---|---|
| Small plants | - | - | 6,500 | 5,000 | - | - |
| Medium plants | 6,500* | 10,200** | 8,700 | 9,100 | 8,700 | 11,300 |
| Large plants | 9,600 | 9,000 | 9,300 | 12,600 | 9,300 | 13,500 |
| Total number of matches | 3 | 4 | 8 | 5 | 7 | 4 |

[a] Figures are calculated as the output per employee in the kiln and cement area incl. maintenance; figures are rounded to the next hundred.
* Average of group 1 and 2a. The latter are medium-sized plants with remarkably lower emissions than the average of the total group 2.
** Average of remaining three medium-sized plants of group 2 called group 2b. For ease of illustration group 2b also includes the remaining large plant of group 2 with average emissions.

on average been lower than in the Spanish or British plants due to market reasons and not because of environmental legislation. Large Spanish plants show the highest degree of capacity utilisation; this would also explain their high productivity. Within Germany the large East German plants show the lowest degree of capacity utilisation. This would be because the construction boom after German reunification has slowed down. Furthermore, production costs, price per tonne and sales per head do not give the German plants an economic advantage over the plants in group 2 and 3 of the other sample countries. Still, costly secondary measures which really bring emissions down, have only been introduced in the German industry on a broad basis. Simultaneously, the measures do not seem to exert a significant impact on profitability. During additional interviews with headquarter chief executives of multinational cement companies it was said that German plants have always been profitable despite their environmental investments.

*Input indicators of competitiveness and environmental performance*

It was also hypothesised that modern plants can attain better environmental performance because the newest technology also embodies best environmental technology. It was shown for all sample countries that new kilns have a high environmental performance and lead to high productivity levels. In Germany also relatively old kilns can reach a favourable environmental performance. This is most likely due to the national approach to environmental standards. Therefore also old kilns are maintained at a high standard.

Moreover, 80 percent of German plants had expert systems in place. In Spain and the UK it was only 60 percent of sample plants. In the interviews the importance of skills related to the use of expert systems were stressed by the German plants. The operators in the control room underwent a special training in which steadiness both of process efficiency and emissions was taught. However, the assumed positive impact of skills (here measured indirectly in the use of expert systems) on environmental performance can be demonstrated only for small and large German plants and in the international comparison between Germany and UK for medium- sized plants. All German plants tended to have higher investments in the past and plan higher future investment than their foreign counterparts. In addition to total annual investment over the last five years also detailed data for all environmental investments undertaken during the last 10 years were asked.[5] As far as data are available there is a trend that German plants incur the highest compliance costs measured as capital costs of environmental measures.

All German plants in group 1 and 2 have on average invested more in environmental initiatives than their Spanish and British counterparts with higher emissions (see Table 8). Environmental investments in the large new German plants can-

[5] Data were scarce for general primary measures. However, investments for $NO_x$ primary (process-integrated) measures and secondary (end-of-pipe) measures for the reduction of $NO_x$, $SO_x$ and dust emissions were well recorded. Since secondary measures and also $NO_x$ primary measures are much more expensive than general primary measures, they reasonably reflect the additional burden created by environmental regulation and can be regarded as a proxy of total compliance costs. Most of these environmental measures were undertaken during the last five to ten years; they were converted into prices of 1998 and evaluated in relation to sales in 1998.

**Table 8**

**Environmental investment in primary $NO_x$ measures and secondary measures for $NO_x$, $SO_x$ and dust reduction as percent of sales* in the sample**

| Env. Category | Germany | Germany | Germany | Spain | Germany | UK |
|---|---|---|---|---|---|---|
| | Average of group 1 and 2a | Average of group 2b | Average of group 1 and 2 (total) | Average of group 2 and 3 | Average of group 1 and 2 (total) | Average of group 2 and 3 |
| Small plants | – | – | n.a. | 5.4 | – | – |
| Medium plants | 4** | 8*** | 6.4 | 1.6 | 6.4 | 6 |
| Large plants | new plant | new plant | New plants | 0.8 | new plants | 14.1 |
| Total number of matches | 3 | 4 | 8 | 5 | 7 | 4 |

* The investments under concern were undertaken between 1988 and 1998, were converted into prices of 1998 and put into relation of sales in 1998.
**Average of group 1 and 2a. The latter are medium-sized plants with remarkably lower emissions than the average of the total group 2.
*** Average of remaining three medium-sized plants of group 2 called group 2b. For ease of illustration group 2b also includes the remaining large plant of group 2 with average emissions.

not be separated from total investment. Large British plants had a need for environmental upgrading and show quite high investment levels. From this analysis it is also clear that Spanish plants have invested least and have the weakest environmental performance with four of the five sample plants being classified as group 3. In the UK compliance costs rise with plant size.

All but one German plant of group 1 and 2 use more alternative fuels than their national or international counterparts in group 2 and 3. One large German plant in group 1 covers at the moment 25 percent of its energy consumption by means of alternative fuels, whereas its national counterpart in group 2 already uses 50 percent of alternative fuels. The use of alternative fuels is motivated by cost reducing reasons and was started in Germany already in the mid 1980s. Investment can be several million Euros, but operating costs are reduced because of lower energy costs. Plants achieve a reasonable payback and report a positive impact on profitability. Thus, there is a high potential to offset the additional costs of environmental compliance. In Box 1 examples of savings through alternative fuels are presented for selected German and British plants. All sample plants using alternative fuels have obtained the necessary permits for it in times of increasing environmental investment. A prerequisite for the use of alternative fuels, however, is the implementation of stricter environmental standards, especially for heavy metals.

Concerning ownership, multinationals in Spain and the UK showed a less favourable environmental performance than multinationals located in Germany. The Spanish plant with the lowest emissions was owned by a German multinational. Although this plant was the "best" in terms of emissions in Spain, it did not emit as little as its German sister plant. Many primary measures were in place in that Spanish plant, but fewer secondary pollution reduction techniques than in a comparable German plant. The implication is that multinational companies can benefit from softer legislation in foreign countries.

*Drivers and effects of air pollution abatement efforts in the cement industry*

The impact of clean air regulation on competitiveness of the cement industry depends – among other things like the economic position of a firm – on the nature of the corresponding environmental initiatives, i.e. whether they are end-of-pipe measures that increase costs or whether they are clean technology solutions that can decrease both emissions and costs. Interviews with the cement plant managers were aimed at identifying the individual effects of abatement technologies at plant level. Plant managers were asked which of the currently known best available technologies (BATs) according to the EIPPC Cement BREF were already implemented in the cement works. The motivation for each initiative was examined and as far as the data allowed it, its timing and investment costs were recorded and potential changes arising for the business. These changes included any impact on operating and capital costs, environmental performance, employment and training needs, payback

**Box**

**Examples of costs savings through the use of alternative fuels in Germany and the UK**

Because of its high energy costs, the cement industry has been searching for alternative fuels. Among the types of alternative fuels most frequently used are used tyres, rubber, paper waste and paper sludge, waste woods, waste oils, sewage sludge, plastics and spent solvents. The change from primary to secondary (alternative) fugitive materials is technically relatively easy, although the use of alternative fuels triggers more stringent environmental standards. This has been found in all the German cement sample plants which were already fairly stringently regulated before they introduced alternative fuels. Still, the cost reduction through alternative fuels is sufficiently large to be offsetting the compliance costs for clean air standards in the cement industry. The German waste market is such that if a company uses tyres, it receives about 30 Euros per tonne from the supplier. Moreover it saves 75 Euros per tonne of coal which would have been needed instead of the tyres. This leads to an enormous annual saving of fuel costs depending on the amount of fuel substitution. Some German companies planned to substitute up to 75 percent of their fuel by secondary materials until the year 2001. Individual examples of cost savings in the German sample are as follows:

A large German plant obtains on average 37.5 Euros per tonne of alternative fuel. About 2 tonnes of alternative fuels are needed to reach the same heat value as produced by a tonne of coal which costs about 50 Euros per tonne. Consequently per tonne of replaced coal the plant saves 125 Euros (2 x 37.5 + 50). Altogether the plant can save energy costs amounting to 7.5 percent of its annual turnover. The plant was modernised and incurred the highest compliance costs in the sample. It was planned to reduce energy costs down to zero through the increased use of alternative fuels.

Another large German plant uses 17 percent of alternative fuels and obtains 10 Euros per tonne. Price for brown coal costs usually lies around 25 Euros per tonne. The plant can save energy costs amounting to 1.7 percent of its annual sales.

A large British plant used 20,000 tonnes of tyres and obtained revenues of 18 Euros per tonne. Coal would costs the plant 57 Euros per tonne. It was reported that savings through alternative fuels sum up to 93 Euros per tonne of replaced coal and to 2.5 percent of turnover.

times, maintenance, process efficiency, and impact on capacity, output and profitability.

The more strictly regulated German firms have on average implemented more abatement measures than their counterparts in Spain and the UK and have done this in the majority of cases with economically and/or environmentally more beneficial effects. It has to be stressed that German plants – perhaps because of stringent regulation – have voluntarily implemented other cost reducing measures to a much wider and deeper extent than cement plants in countries with softer regulation.

*Legislation-driven measures*

Concerning the purely legislation-driven measures selective non-catalytic reduction (SNCR), staged combustion and absorbent addition which are undertaken only in the German sample and nowhere else, no loss in competitiveness of German plants was detected. Although these investments increase operating costs (see Table 3 above), sample plants remained profitable. With regard to SNCR and absorbent addition those plants with the highest investment costs achieved the largest reduction in emissions. All plants using these secondary abatement techniques, also used alternative fuels and could at least partly compensate the increase in production costs due to secondary measures with a decrease in energy costs (see also below). Although German plants were forced to invest in low $NO_x$ burners early on, no negative impact on competitiveness was reported. German firms invested earlier in bag filter replacements and reduced emissions more effectively than cement plants in Spain and the UK. This is also the case for noise measures.

*Cost or process-driven measures*

The environmentally most favourable performing German plants have voluntarily invested in electro filters and could achieve more profitable solutions for their business than the plants in Spain and the UK which undertook the investment because of legislative pressure. Moreover, German plants with particular energy initiatives have reduced their energy consumption more than plants in the other countries, doing it also for cost-reducing reasons. Also their share of energy costs in total production costs is lowest in the entire sample. German plants spent more on expert systems and achieved more beneficial results both with respect to economic and environmental consequences of this measure than plants in other countries investing also for process-efficiency reasons. Almost all German plants have been using alternative fuels since the mid-1980s and thus were able to reduce their energy costs substantially. Only in exceptional cases did emissions go down. This initiative was not used frequently in the other sample countries at the time of the study. With respect to process-optimisation

measures there is no particular advantage for German firms.

*Competitive advantages and disadvantages*

Only one cement plant in Germany clearly mentioned the ability to fulfil strict environmental standards as a competitive advantage. Several other German plants stated low energy costs and modernity of plant as most important competitive features. Indirectly, however, these aspects are connected to favourable environmental performance. In Spain and the UK low distance to raw material, low transport costs and consistency of product quality were the most frequently stated competitive advantages. With respect to competitive disadvantages German cement plants stressed that environmental requirements were high. But the top environmental performers did not complain about environmental costs, only one large German plant felt that it was suffering from a competitive disadvantage because of environmental costs. Simultaneously this plant stated problems related to infrastructure and plant design as more important. In Spain and the UK current environmental requirements and costs were hardly mentioned at all.

## Summary and conclusions

Cement is a commodity of mass production and hence cost competitiveness is decisive for business success. Therefore the impact of additional costs caused by environmental regulation is an important issue for the industry, especially for Germany where regulation is more stringent than in the other sample countries. It was shown that the German cement industry already uses costly pollution abatement techniques which are not frequently used elsewhere. However, the analysis of the interview data collected in German cement factories shows hardly an impact on the competitiveness of German plants and proves that dry technology cement plants operating up to a high environmental standard are economically viable.[6]

A number of factors were identified that affect the ease and take-up of best available technologies. These factors will be important for those EU countries that will in the future be more strictly regulated via the implementation of the IPPC-Directive and do not want to loose their level of competitiveness. Modernity, technology, size, skills and form of ownership are among these facilitating factors. Furthermore, those plants which already have secondary abatement measures in place (in particular in Germany) were favoured by an above-average use of cost-reducing primary measures and the use of alternative fuels. Time for planning investments is important not only because current investment is long-lived but also because the plants that already lag behind require more time to fulfil environmental standards. But even these plants should state their plans of how and when they will achieve BAT-associated emission levels. However, implementation and sequencing of environmental improvements should also consider the possibility of minimizing total environmental costs through the use of primary measures and alternative fuels.

[6] This finding is also confirmed for plants in Sweden and Austria visited by the main author in 1999 and 2000, where environmental regulation is at least partially even more stringent than in Germany.

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# Child Support and Children's Tax Allowances in Selected European Countries*

Rüdiger Parsche and
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In order to capture adequately and completely the support provided by the state to families and their children – or the burden laid on them – and compare the results internationally, it would be necessary to examine the entire benefits and services, such as the availability of kindergartens, educational and health services, as well as the monetary transfers to families by the state, tax exemptions and deductions for families with children.

The following international comparison is limited to an investigation of the monetary transfers in the form of child support and how children are taken into account in the income tax system. Even with this restriction an international comparison is difficult because of the complexity and the different systems of family benefits in the individual countries. For this reason we include concrete examples of familial situations for which an international comparison is made. This approach has the disadvantage that from the cited examples generalisations for the entire population of a country can only be drawn to a limited extent, especially since family benefits and the effect thereof must be considered as a whole. Individual components, as we analyze them here, do not necessarily reflect the family friendliness of the entire regulatory system.

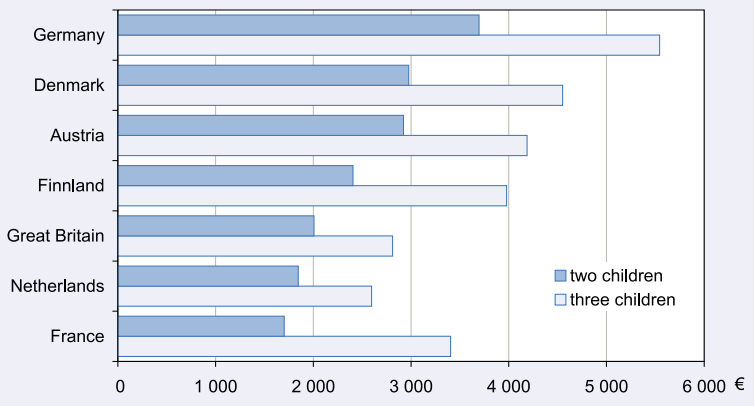
**Support for dependent children**

In the countries investigated (Table1 and Figure) the only similarity with respect to the support for dependent children is that the distribution of benefits is dependent on income and the benefits themselves are not subject to income tax. Otherwise the regulations vary considerably. In general the countries have based the amount of benefits on the number of children (Germany, Finland, United Kingdom) or according to the age of the child (Denmark and Austria). Only in France and in the Netherlands is there a double differentiation of the benefits based on age and on the number of children. In the case of the Netherlands this is a regulation which is being phased out and is valid only for children born before 1995. For all children born thereafter a system independent of the number of children has been established.

Because of the variety of regulations in connection with child support it is difficult to evaluate the family friendliness of the countries based on the allowances alone. For this reason two model families will be examined in order to compare the benefits of the individual country regulations. The one family has two children between the ages of 5 and 13; the other has three children aged 2, 5 and 13. The Figure shows the children's allowances in the individual countries per year.

The two sample calculations show that when solely viewing child support for the chosen family type, the German benefits as defined by law are the most advantageous of all the countries investigated. That is due to the continuously high payment for the first three children of €1,848 per year. However, it should be noted that child support payments within the framework of the German option model are offset against the tax effect of the

Child Support for Families with Two or Three Children, 2003 in Selected EU Countries, in Euro p.a.




Source: Calculations of Ifo Institute.

* This article presents the summary of a research project of the Ifo Institute, commissioned by the German Council for Family Relief (Deutscher Arbeitskreis für Familienhilfe). Rüdiger Parsche is head of Ifo's department Public Sector, Rigmar Osterkamp is head of Ifo's project group European Institutional Comparisons.

**Table 1**

**Child support in selected EU countries**

| Country | Standard age limit (maximum) | Differentiation based on | | | Standard amounts (per annum) in € per child | | | | Beneficiaries | Subject to tax |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Age | No. of children | Income | | | | | | |
| Austria | 19 (26) | √ | – | – | 0–3 years old 1,264.80 | 3–10 years old 1,352.40 | 10–18 years old 1,570.80 | 19–26 years old 1,832.40 | All those obliged to support children with habitual residence or ordinary residence in Austria | – |
| Denmark | 18 | √ | – | – | 0–3 years 1,736 | 3–6 years 1,576 | 7–18 years 1,240 | | Danes and foreigners subject to income tax. In some cases a minimum period of residence is required for foreigners | – |
| Finland | 17 | – | √ | – | 1 child 1,080.00<br>2 children 1,326.00<br>3 children 1,572.00<br>4 children 1,818.00<br>5 children 2,064.00<br>Additional payment for single parents 403,20 | | | | Couples, singles and same sex partnerships with child living in Finland | – |
| France | 20 | √ | √ | – | Child support<br>1 child<br>2 childrern 1,328.52<br>3 children and more 1,702.08<br>Additional support<br>11–16 373.68 over 16 664.32 | | | | All individuals who live in France with at least two children | – |
| Germany | 18 (27) | – | √ | – | for 1–3 Children 1,848<br>more than 3 2,148 | | | | All Germans and foreigners with a valid resident permit subject to income tax | –[a] |
| Netherlands | 16 (18) | √ | √ | – | Children born before 1/1/95<br>families with ... children / 8–11 years old / 12–17 years old<br>1 / 2 857.84 / 1,009.24<br>3 969.04 / 1,140.04<br>4 1,006.08 / 1,183.60<br>5 1,087.52 / 1,279.44<br>6 1,136.40 / 1,336.92<br>etc. 1,168.96 / 1,375.24<br>Children born after 1/1/95<br>0–6 years old 706.48 / 6–12 years old 857.84 | | | | All those obliged to support children with residence in the Netherlands or with employment subject to income tax in the Netherlands and membership in the national insurance | – |
| United Kingdom | 16 (19) | – | √ | – | first child 1,202<br>all others 805 | | | | Individuals responsible for child-rearing and ordinary residence in the United Kingdom | – |

[a] Child support is not subject to income tax in Germany, but contributions to social insurance are required for the benefits.

Source: Mennel and Förster (2003); design of the table and additional information provided by the Ifo Institute.

payments. That means a family can choose between child support and the deduction of a certain amount per child depending on which is more beneficial to them. For this reason it is not possible to say for Germany – in contrast to the other countries – which part of the child allowance is an actual state transfer payment and thus a true component of family support. Only for families with such a minimal income that no wage or income tax is paid can the child allowance be classified completely as family support.

The child support systems of Denmark and Austria, which are based on children's age, fall considerably behind Germany for both our model families of two and three children. What is notice-

**Table 2**

**Tax deductions and exemptions for children in selected EU countries**

| Country | Name | Type | Differentiation according to | | | Standard amounts (yearly) in € per child | Beneficiaries | Income limits | Special features |
|---|---|---|---|---|---|---|---|---|---|
| | | | Age | Number of children | Income | | | | |
| Austria | Kinderabsetzbetrag | Tax deduction/transfer payment | - | - | - | € 610.80 | Those subject to tax and entitled to receive child support | – | Direct payment to beneficiaries |
| | Alleinerzieherabsetzbetrag | Tax deduction | - | - | - | € 364 | Single parents subject to tax and married couples with a sole earner | – | Deduction from tax debt. If tax debt less, payment as a negative income tax |
| Denmark | –[a)] | no tax deductions nor exemptions for children | | | | | | | |
| Finland | – | no tax deductions nor exemptions for children | | | | | | | |
| France | –[b)] | no tax deductions nor exemptions for children | | | | | | | |
| Germany | Kinderfreibetrag | Statutory tax exemption | - | - | - | € 3,648 | Those subject to tax with a child under 18 years of age | Indirect due to option model | Option model |
| Netherlands | Kinderkorting | Tax deduction | - | - | √ | € 40 | Those subject to tax which child under 18 years of age | Max. € 56,191 | If the conditions are fulfilled, the individual deductions are added together. |
| | Aanvullende kinderkorting | | - | - | √ | € 341<br>€ 428 | | Max. € 29,096<br>Max. € 25,704 | |
| | Combinatiekorting | | √ | - | √ | € 190 | Those subject to tax with child under 12 years of age and minimum income from present employment | Minimum income € 4,060 | |
| | Alleenstandeouderenkorting | | √ | - | - | € 1,301 | Single parents with child under 27 years of age | – | |
| | Aanvullende alleenstandeouderenkorting | | √ | - | - | 4.3% of the income, maximum € 1,301 | Single parents with a child under 12 years of age | – | |
| United Kingdom | Child Tax Credit | Tax deduction/transfer payment | - | - | √ | Family component: € 785; Baby component:[c)] € 785; Children's component: € 2,081; Handicapped component: € 4,350 | Families with children independent of gainful employment | Family component: € 72,015<br>Children's component: € 19,185 | Direct payment to beneficiaries |

[a)] Only individuals obliged to support children who live with them are entitled to an exemption of € 3,445. – [b)] Is only valid for the birth year. – [c)] Working parent are entitled to an allowance for small children (AGED) which includes a tax deduction of up to € 5,000.

Source: Mennel and Förster (2003); design of the table and additional information provided by the Ifo Institute.

able is the different philosophy in both countries. The Danish child support payments for children to the age of three are almost as high as those paid in Germany. With increased age the allowance is reduced, and the difference to Germany increases as the child grows older. In Austria, on the other hand, the age differentiation works the other way around. Here the payments increase as the child becomes older

The Danish approach – reduction in payment with increased age – is an exception among the countries investigated. In most cases child allowances remain constant or increase regardless of the number and age of the children. The United Kingdom is an exception in that the payment for the first child is approximately 50 percent higher than for the following children. This has lead to – for our model families – an allowance in the United Kingdom that is slightly higher than in the Netherlands and France, where the lowest child support is provided. In these countries child support payments for families with two children between the ages of 5 and 13 make up about only half of those paid in Germany.

If one now views child support payments for a family with three children, the ranking of the countries remains basically the same (see figure). Only France moves up two places due to generous support for the third child, thereby reaching just under the support for the third child in Germany. Due to the lower level of support for the first child, the French child support payments for families with three children are, however, still lower than the German, Danish, Austrian and Finnish benefits.

The time period for payment of child support benefits also varies considerably from country to country. The age limit is generally between 16 (the Netherlands, United Kingdom) and 20 years of age (France). The maximum age is, however, in some countries considerably higher if studies and professional training are taken into consideration. In Germany it is nine years beyond the general age limit of 18 years. This means that the time period is valid for at most 27 years. In Denmark, Finland and France the maximum and the standard age limit are the same.

In summary it can be said – if we overlook the option model problem – that the German child support payments are the most generous among the European countries considered. If the deduction of the child support payment is taken into account as a result of the option model, then the top position of Germany is even strengthened. The child support payments in the United Kingdom and in the Netherlands are considerably lower.

**Allowance for dependent children as an income tax deduction**

In most of the investigated countries the allowance for dependent children (Table 2) is conceived in such a way that it can be deducted from the tax debt. It is a fixed amount that is dependent on income and the individual tax level of the family. Germany is the only country where the allowance for dependent children lowers the taxable base. The reduction of the tax debt thus depends on the individual tax rate of the family.

In Austria and the United Kingdom the benefits are paid directly to the beneficiaries. If the statutory deductions surpass the actual tax payment, they are treated as a negative tax. The British “child tax credit” has a feature that is also found in Dutch tax deductions. In both countries the deduction is only valid up to a specific upper limit of family income. Families with a higher income thus do not qualify for this tax deduction. In contrast the option model in Germany has its effect in the opposite direction of a lower income limit, under which a tax deduction is not possible.

The system in the Netherlands is particularly complicated. Let it suffice to note that in the Netherlands there is not only a (varying) upper income limit for the deductible child allowance (Kinderkorting) and the complimentary child allowance deduction, but also a minimum income as a prerequisite to qualify for an additional deduction, which, however, at €4,060 is quite low. In the Netherlands the deductions are also connected with further conditions, the age of the children being an important component.

In Denmark there is no general deductible child allowance. Only parents still obliged by law to support their children can deduct an allowance if their children do not live with them. Finland also does not have a deductible allowance in its tax system.
In France income is assessed on the basis of a family splitting system and divided by the so-called

"parts", which are determined on the basis of marriage status and the number of children. For married couples with one child, this is set off against a factor of 0.5. The third child increases the factor to 1.0 (Mennel and Förster 2002). It should be emphasised that both France and the Scandinavian countries have placed the emphasis of family support onto providing child care. There are numerous ways to have a child cared for, both inside and outside the home. The parents are supported by the state and thus have the choice of staying at home with the children or continuing to work.

## Summary

Due to the complexity of the regulations in the countries investigated it is difficult to compare in a comprehensive and simplified way the extent of monetary and tax support provided to families. The differences in child support are considerable, but tax deduction possibilities make up – at least partially – for these differences. The family friendliness that is often ascribed to the French system only sets in with a larger number of children. It is most likely motivated by population policy concerns. In contrast it is often maintained that in Germany families with children are treated unfavourably with respect to monetary support and possible tax deductions. This study shows, however, that a general criticism of this sort does not hold.

It should be mentioned that the provision of additional benefits and services that could not be investigated here varies greatly in an international comparison. In Germany, for example, child care possibilities are relatively limited (except for the new Länder), whilst the provision of kindergartens is generous in the Scandinavian countries.

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# Health-care Reforms in Singapore – Twenty Years of Medical Savings Accounts

Jonas Schreyögg and
Lim Meng Kin*

## The economic and demographic development of Singapore

The model of Medical Savings Accounts enjoys increasing popularity in many countries all over the world (Henke et al. 2004, 10–19; Maynard and Dixon 2002, 121–123; Schreyögg 2004). In 1984, Singapore was the first country in the world to introduce Medical Savings Accounts (MSAs) as a method for financing health care. Later, South Africa, China and the USA adapted a similar form of the concept for certain parts of their populations. Singapore, however, has the most established system of MSAs so far and has integrated it into a particularly economically oriented health care system that keeps health costs at a very low level while maintaining a high standard of quality.

Singapore belongs to the so-called "tiger economies" and is a relatively small country with a population of four million inhabitants. As a result of high economic growth rates in the past few decades, the average per-capita income in Singapore is now comparable with that of European countries or the US. The unemployment rate in the year 2003, at 5.4 percent, was moderate, as was the inflation rate at 0.5 percent (Singapore Department of Statistics 2004).

Similar to other highly developed states, Singapore is confronted with the problem of low birth rates. The net reproduction rate, at 0.8 children per inhabitant, is too low to sustain the indigenous population level. For this reason, the government is endeavouring to bring qualified foreign workers to Singapore. In spite of the influx of young immigrant workers, the proportion of persons over 65 years is constantly increasing. In 2003, it amounted to 7.6 percent (Singapore Department of Statistics 2004) and will grow by 2015 to 11.0 percent. It is even estimated that by the year 2030 this proportion will reach 20.1 percent (Phua and Teng 1998, 36–40; Singapore Department of Statistics 2000).

In the face of this development and the additional accelerating rate of advances in medical technology, it became evident that a health care system funded entirely by taxes in an environment of rising health care expenditures and falling tax revenues as a result of a declining labour force would not be sustainable in the long run. In addition, the conclusion was reached that a system in which health is solely provided as a public good on demand negated the economic principle of the scarcity of resources because it did not reflect any prices. A reformed system was therefore intended to solve the anticipated demographic problem and, at the same time, to create incentives for the health-insured to act economically, in order to avoid a sharp rise in health expenditure as experienced in other industrialised countries. For this reason the old system was partially replaced in 1984 by a system of MSAs, combined with a mandatory health insurance for catastrophic illnesses.

## The three pillars of financing health care

The health system in Singapore basically consists of three pillars (the so-called 3 Ms), each of which fulfils a different aim and is based on different financing mechanisms. The core is comprised of the MSA system-component called Medisave. This model is based on the idea that the usual insurance systems lead to an inefficient utilisation of resources, because insured persons frequently consume health services that, from a medical point of view, may actually not be needed. Hence, in contrast to commonly-known insurance systems, the MSA model does not incorporate any form of "risk pooling". This means that individuals do not pay into a common pool, in the framework of a health insurance, out of which, in the event of illness, each insured person receives certain funds to cover the costs of treatment. Instead, everyone puts aside individual savings to cover health care costs.

Medical Savings Accounts are part of a superordinated savings programme, called Central Provident

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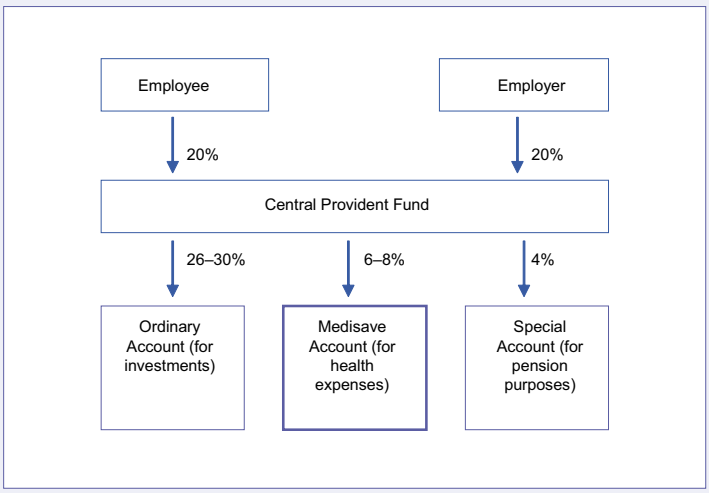
**Figure 1**

THE CENTRAL PROVIDENT FUND AS THE CORE OF SINGAPORE'S SOCIAL SECURITY SYSTEM
(percentage refer to gross pay)




Fund (CPF), which represents the central element of Singapore's social security system (Figure 1). It is a savings programme run by the state in which every gainfully employed citizen of Singapore is obliged to participate. The citizen pays 20 percent of his gross income into the CPF while another 20 percent of gross income is paid by the employer. Within the CPF, 6–8 percentage points (depending on age) go into the Medisave Accounts while the remaining savings go into the other accounts for investment and pension purposes.

Thus, two working spouses will each have a Medisave Account, out of which their respective health care services and those of their children, until they reach working age, must be financed. At the end of 2001, 2.71 million Medisave accounts existed in Singapore. With a permanent population of 3.26 million, this corresponds to an 84 percent coverage ratio. Considering that health services provided for children and elderly dependents are financed through the Medisave Accounts of their family members, nearly comprehensive coverage has been reached (Ministry of Health 2002).

All amounts paid into this account are invested by the state government on the capital market and accrue a guaranteed rate of interest. In case of illness, the individual can pay for his treatment and that of his dependents from the savings in his Medical Savings Account. However, only hospital costs and certain selected out-patient costs approved by the state in a catalogue of services may be financed by the Medical Savings Account. In the case of out-patient services to treat non-serious illnesses or ailments that are not contained in the catalogue of services, the citizens must pay the expenses incurred out of their own pocket. Citizens receive regular statements of account, showing the current status of their savings account.

If the funds accumulated in the savings account are not exhausted by the end of a given year, the remaining amount is saved in the individual's account to finance future health care costs. As soon as a Medisave Account shows a balance of SD 30,000 (ca. EUR 14,650), all amounts paid above this amount are automatically transferred to the ordinary savings account of the respective individual's Central Provident Fund account, which every employed citizen of Singapore is legally obliged to maintain. The resources in this ordinary account are available for other investments, e.g. the purchase of an owner-occupied house or even "blue chip" shares on the Singapore Stock Exchange. In this way, old-age provisions can be steadily built up for the time after working life. The account holder can also bequeath the Medical Savings Account, as well as all other compulsory savings accounts, to his descendants.

Since, however, with Medical Savings Accounts there is no pooling of risks, costs for the treatment of chronic or serious diseases frequently exceed the amount saved in the Medical Savings Account. For such cases, the system-component Medishield – the second pillar of the system – was created as a complement to Medisave. This system-component can be characterised as "high-risk, catastrophic insurance", which functions purely in accordance with the principles of insurance and does not involve any income redistribution. It is intended to finance both expensive hospital treatments as well as out-patient treatments for chronic diseases. The insurance contributions are paid as premiums, depending on age, and can be financed from indi-

vidual savings, (i.e. from their respective Medical Savings Accounts). They are identical for all persons within a given age group, but rise with increasing age.

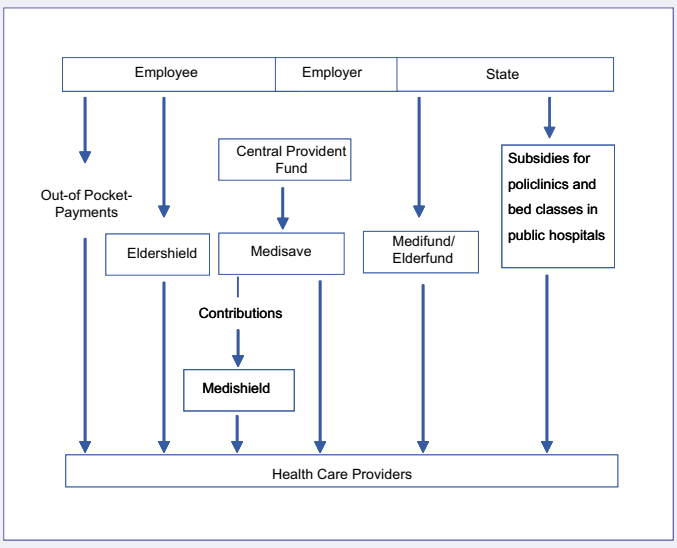
A third pillar guarantees minimum health provision for citizens who are unable to set aside sufficient savings for their health care. This minimum provision is achieved by direct transfers to pay for the hospital bills of citizens with low incomes, in the form of an endowment fund, called Medifund, which was set up by the state and introduced in 1993.

At the same time, certain hospital bed classes are subsidised from tax revenues (Low and Aw 1997). There are different levels of subsidies for bed classes A to C. While C (open ward) is subsidized at a rate of 80 percent by the state, A (single bed room) is not subsidized at all. Patients of all bed classes, however, receive the same quality of treatment. This concept of differential pricing of beds allows citizens to stay in the lowest bed classes C or B2 (6 beds) if they wish to enjoy government subsidies or in the more exclusive wards if they wish to finance the difference by out-of-pocket payments or private health insurance (Lim 1998, 16–22).

The existing system of health assurance, comprising Medisave, Medishield and Medifund, has been complemented since 2002 by the two further pillars, "Eldershield" and "Eldercare Fund", which serve as a scheme for long-term care. Figure 2 gives an overview on all pillars of the Singapore healthcare system. The long-term care insurance, Eldershield, is not obligatory and the contributions are levied in the form of age-dependent, per-head premiums. If long-term care is needed, Eldershield pays the insured a monthly sum of SD 300 (EUR 145) for a period of 5 years. Presumably, due to this short period of reimbursement and the limited payments, only 70 percent (2003) of the population are members of this insurance so far (Busse and Schlette 2003, 26–27). Eldershield is complemented by Eldercare Fund, which finances subsidies for elderly care facilities and services run by the voluntary welfare organisations for elderly citizens with low incomes who may be unable to afford the contributions for Eldershield. Like Medifund, this fund was also set up and administered by the state.

**Figure 2**

MONETARY FLOWS IN THE SINGAPOREAN HEALTH-CARE SYSTEM



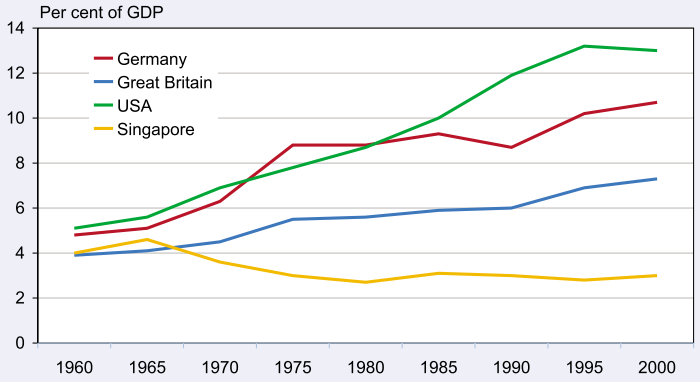

## Low health expenditure and its causes

Compared with other industrialised countries of the west with a similar per-capita income, health expenditure in Singapore is notably lower. In the year 2003, health costs represented a proportion of 3.0 percent of the Gross Domestic Product. Figure 3 clearly illustrates that health expenditure in Singapore over the years have been kept constant at ca. 3 percent, while in countries like the USA, Germany or Great Britain they have been increasing.

This development is very surprising, because per capita income, living standard and the standard of the health care system are comparable, for example, with Germany. To a certain extent this can be explained by the low percentage of the Singaporean population above age 65 (about 7.3 percent), which is lower than in European countries (Singapore Department of Statistics 2001, 9). But calculations show that, even assuming that 14 percent of the population is older than age 65, (comparable to that of European countries), the share of health expenditures would still only sum up to 5.8 percent (Low et al. 1996). This may not be exclusively attributable to the introduction of Medical Savings Accounts but there exists a number of indications on the basis of different studies that they have at least made a considerable contribution to

**Figure 3**

HEALTH EXPENDITURE AS PERCENTAGE OF GDP FOR SELECTED COUNTRIES DURING THE PERIOD 1960 - 2000




Source: Ministry of Health Singapore 2001; OECD Health Data 2003.

this comparatively low figure (Prescott/Nichols 1998, 19–32).

It is obvious that a system of savings accounts demands an increased sense of responsibility on the part of the citizens regarding the way they use the funds available in their respective accounts. The separation of utilisation and financing of health services, which is characteristic for a pure health insurance system, no longer exists. In Singapore, the responsibility for making decisions regarding an efficient use of available resources has been transferred to the individual. The fact that the insured are required to finance a part of their health costs from their own savings, accumulated in the MSAs, encourages a higher degree of cost-consciousness (Lim 2002, 302–3; Schreyögg 2003, 78–86).

The translation of this cost-awareness into a real change in behaviour with regard to the demand for services on the part of the insured is facilitated by a very high degree of transparency concerning services and their prices in hospitals, polyclinics and physicians' practices, respectively. The prices of individual institutions may be viewed on the internet or are available on request so that the risk of excessive invoices for the delivered services is reduced. In Singapore, insured persons attach great importance, during the entire process of treatment, to being able to exert their own influence on the amount of costs involved and on the efficacy of the results.

At the same time, it must be mentioned that the transformation phase after the introduction of Medical Savings Accounts lasted several years. Many insured persons at the beginning, i.e. immediately after the introduction of MSAs in the year 1984, were unable to cope with this responsibility. For example, it was seen in the first few years that some citizens did not make use of the amounts saved in their MSAs in a sustainable manner. In the first year after introduction 24 percent of the patients treated in the highest bed class had a monthly net income of less than S$ 1,000. The savings accumulated in the MSAs of these insured were thus, in many cases, immediately exhausted all at once by one claim. On subsequent questioning of the insurees concerned, it was discovered that they frequently had insufficient knowledge concerning the actual prices for inpatient treatments and the various different bed classes (Lim 1997, 277).

For this reason, an obligatory financial advisory service in hospitals and polyclinics was established in 1986, whereby potential patients are informed about the current balance of their Medical Savings Account and the estimated hospital bill size at the point of admission so that they can make informed choices with regard to the selection of bed class.

A further motivation for Singapore to introduce MSAs was to enable the accumulation of individual capital stocks from the amounts saved which, in this way, would serve as reserves to cover health costs in old-age. The inter-generation redistribution from young to old was to be gradually reduced and the system as a whole, in view of the expected development towards an aging society, was to be relieved. The investment of the capital stock in the capital market, at the same time, has a positive influence on the welfare of the national economy by the increased accumulation of capital. Though this may trigger certain risks concerning exchange rates, currency and inflation, these have not yet been seen in the case of Singapore.

The transition from a system funded primarily through taxes to a system of MSAs based on individual savings required a solution for those who have lived with the old system for the longest part

of their lives. The generation that went into retirement before 1984 was not in a position to build up a capital stock sufficient to provide enough reserves for old-age. For this reason, a law was created that obliged Singapore's citizens to take care of their own direct family members in need (Phua 2001, 169–83). The provision of security against illness for persons that had been unable to build capital stocks in the framework of the new system-component was thus and still is initially assured by inter-family transfers. Only when the direct family members are not in a position to pay for their needy relatives, the health costs of the persons concerned are financed by the state.

The accumulated assets of all Medical Savings Accounts have grown constantly since their introduction and in the meantime amount to SD 22.7 billion (EUR 11.1 billion). The average amount per account amounts to SD 8,300 (EUR 4,070; Central Provident Fund Board 2002). In spite of simultaneously rising pay-outs, the Medical Savings Accounts are increasingly fulfilling their function for building up reserves for health costs in old-age.

**"Lessons learned" for other countries**

As already mentioned at the beginning, the model of Medical Savings Accounts in Singapore has meanwhile been adopted in various other countries. In South Africa it is applied on the market for private health insurances and in the meantime has reached a market share of over 50 percent. In the USA, it was tested during the period from 1996–2003 in the framework of a pilot project in the private health insurance market and since the beginning of 2004 it has been permitted within the framework of Medicare. Both in the USA as well as in South Africa, Medical Savings Accounts are designed somewhat differently than in Singapore. In the former cases, citizens pay a certain tax-free amount per month into their Medical Savings Accounts, which in the optimal case is precisely sufficient to cover a defined annual deductible. The focus is rather on a higher cost-awareness on the part of the insured than on the function of building up capital reserves for old-age (Schreyögg 2004; Dixon 2002, 408–16).

The examples of South Africa and the USA clearly show the variability of the model of MSAs. They can be used both as a complement to an existing compulsory system of funding, as is practised in Singapore, or as a feature in certain health plans for private health insurance.

According to their respective aims, MSAs represent an instrument for correcting possible weaknesses in an existing system. They are suitable for encouraging a higher cost-awareness on the part of the insured, thus bringing about a more efficient utilisation of health services, as well as for building up capital reserves for old-age, thus relieving the burden of intergenerational redistribution inherent in pure pay-as-you-go systems.

However, for a possible implementation of MSAs, it is apparently very important to recognise, as in the example of Singapore, that a certain redistribution mechanism has to be integrated into the system (Maynard and Dixon 2002, 121–23; Lim 2000, 83–92). And as already mentioned, for this system to work it is necessary to provide comprehensive guidance and information in order to ensure that older or handicapped insured also have the chance to cope with this innovation.

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# Inflation Targeting

During the 1990s, many countries have chosen to adopt some kind of a flexible exchange rate regime which reduces the vulnerability to exchange rate attacks and gives their Central Banks a certain degree of leeway to conduct an independent monetary policy. For putting such a policy into operation, two targets could be pursued alternatively: a monetary growth target and an inflation rate target. Due to the instability of money demand a monetary target is often regarded as impractical. In a recent IMF working paper (Carare and Stone, 2003) 42 countries are analysed which have chosen a certain form of inflation targeting.

The authors distinguish three main forms of inflation targeting: "eclectic inflation targeting", "full-fledged inflation targeting", and "inflation targeting lite". The table below characterises some aspects of the way in which inflation targeting is performed in a selection of countries. (The table leaves out mainly the non-European transition and developing countries which are, however, covered in the named study.)

*Eclectic inflation targeting* is seen to be at work in the monetary policy of the European Central Bank, in Denmark and Switzerland as well as in Japan and the US. These countries have long since maintained low inflation rates, and their financial markets are highly developed. This leads to a high credibility of their anti-inflation policies what enables them to realise low inflation rates even without full transparency and accountability with respect to an inflation target. The leeway monetary policy gains can be used to smooth output fluctuations. (Whether this leeway, provided by eclectic inflation targeting, is sufficiently used by the ECB, is another question, see e.g. Sinn (2003). One could also ask whether, e.g., the ECB's policy is correctly characterised by eclectic inflation targeting.)

*Full-fledged inflation targeting* is seen to exist in Sweden, the UK, Norway, Czech Republic, Australia, Canada, New Zealand. In these countries financial stability, the development of financial markets, and thus the level of credibility is not as high as in the countries with eclectic inflation targeting. They commit clearly to their inflation target and underline the commitment by a transparent monetary policy framework. This reduces the time inconsistency problem a Central Bank faces but, at the same time, reduces also the leeway of monetary policy to stabilise aggregate output. New Zealand was the first country (1989) to adopt this type of monetary policy.

*Inflation targeting lite* is observed only in emerging economies (only partially covered in the table). These countries have not gained sufficient credibility to maintain low inflation rates without credible and transparent commitment. Thus, they are candidates for full-fledged inflation targeting. On the other hand, many of these countries are repeatedly exposed to shocks (real and financial, external and internal) which give output stabilisation a high priority. Thus, a transparent commitment to inflation targeting would limit greatly their ability to react to shocks. The trade-off between higher stability of the price level and gaining credibility on one hand, and lower exposure to shocks on the other hand leads to somewhat higher inflation rates coupled with more flexibility to smooth output fluctuations.

In terms of the well-known alternative of a discretionary vs. rules-based monetary policy, one can characterise the policy of *inflation targeting* lite as one with a high degree of discretion, whereas the policy of *full-fledged inflation targeting* is highly rules-based. *Eclectic inflation targeting* takes a middle position in this respect.

R. O.

**References**

Carare, A., Stone, M.R. (2003) "Inflation Targeting Regimes", IMF Working Paper WP/03/9

Sinn, H.-W. (2003) "New Inflation Targets for the ECB", Ifo Viewpoint No 45, May 2003

**Inflation Targeting**

| | Inflation targeting | Year of adoption | Target | Comments | Point target or target range | Inflation targeting announcement made | Target horizon for inflation targets |
|---|---|---|---|---|---|---|---|
| **Euro Zone (1)** | | | | | | | |
| Austria<br>Belgium<br>Finland<br>France<br>Germany<br>Greece<br>Ireland<br>Italy<br>Luxembourg<br>Netherlands<br>Portugal<br>Spain | Eclectic inflation targeting | 2002 | below 2% | The primary objective of the ECB is the maintenance of price stability over the medium term. Price stability is defined as a year-on-year increase in the Harmonised Index of Consumer Prices (HICP) for the euro area of below 2%. The Governing Council has also clarified that, in the pursuit of price stability, it aims to maintain inflation rates below, but close to, 2% over the medium term. (1) | | | |
| **EU countries but without Euro countries** | | | | | | | |
| Denmark (2) | Eclectic inflation targeting | | | No inflation target but exchange rate target vis-à-vis the Euro | | | |
| Sweden (3) | Full-fledged inflation targeting | 1993 | 1 – 3% | Tolerance rate of +/–1% around the target | Point target with range | Central Bank | Indefinite horizon |
| United Kingdom (4) | Full-fledged inflation targeting | 1992 | 2% | | Point target | Government | Indefinite horizon |
| **European non-EU countries** | | | | | | | |
| Norway (5) | Full-fledged inflation targeting | 2001 | 2.5% | | Point target | Government | Indefinite horizon |
| Switzerland (6) | Eclectic inflation targeting | | | The Swiss National Bank defines price stability with 2%. | | | |
| **New EU-member countries** | | | | | | | |
| Cyprus (7) | No | | | No inflation target but exchange rate target vis-à-vis the Euro | | | |
| Czech Republic (8) | Full-fledged inflation targeting | 1998 | 2 – 4% | Inflation target of 3% from January 2006 until adoption of the Euro | Target range of 2 percentage points or less | Jointly by government and central bank | Annual targets, but announced several years in advance. |
| Estonia | No | | | | | | |
| Hungary (9) | Full-fledged inflation targeting | 2001 | 5% for December 2005 | Tolerance rate of +/- 1% around the target | Point target with range | Jointly by government and central bank | Annual Targets, but announced several years in advance |

**Continued Inflation Targeting**

| | Inflation targeting | Year of adoption | Target | Comments | Point target or target range | Inflation targeting announcement made | Target horizon for inflation targets |
|---|---|---|---|---|---|---|---|
| Latvia (10) | No | | | Price stability | | | |
| Lithuania (11) | No | | | No inflation target but exchange rate target vis-à-vis the Euro | | | |
| Malta (12) | No | No inflation target but fixed exchange rate with a basket of currencies: Euro (70%), US$ (20) and GDP (10%). | | | | | |
| Poland (13) | Full-fledged inflation targeting | 1999 | 2.5% | | Target range of 2 percentage points or less | Central bank | Annual targets |
| Slovakia (14) | No | | | No inflation target but aiming on a low inflation in order to join the Euro | | | |
| Slovenia (15) | No | | | No inflation target but aiming on a low inflation in order to join the Euro | | | |
| **Other countries** | | | | | | | |
| Australia (16) | Full-fledged inflation targeting | 1993 | 2 – 3% | | Target range of 2 percentage points or less | Jointly by government and central bank | Indefinite horizon |
| Canada (17) | Full-fledged inflation targeting | 1991 | 2% | Inflation control target range: 1 – 3% | Target range of 2 percentage points or less | Jointly by government and central bank | Indefinite horizon |
| Japan | Eclectic inflation targeting | | | | | | |
| New Zealand | Full-fledged inflation targeting | 1989 | 1 – 3% | | Target range of more than 2 percentage points | Jointly by government and central bank | Indefinite horizon |
| United States | Eclectic inflation targeting | | | Maximum sustainable growth with low inflation | | | |

Country sources: (1) European Central Bank, – (2) Danmarks Nationalbank, – (3) Sveriges Riksbank, – (4) Bank of England, – (5) Norges Bank, – (6) Swiss National Bank, – (7) Central Bank of Cyprus, – (8) Czech Central Bank, – (9) Magyar Nemzeti Bank (Central Bank), – (10) Central Bank of Latvia, – (11) Bank of Lithuania, – (12) Central Bank of Malta, – (13) National Bank of Poland, – (14) National Bank of Slovakia, – (15) Bank of Slovenia, – (16) Reserve Bank of Australia, – (17) Bank of Canada.

Sources: Carare, A., Stone, M.R. (2003).

# Reducing Incentives to Early Retirement

OECD member governments have been active in reducing or removing incentives for early retirement over the past decade. One important aspect of these efforts is the reform of public pension systems. A variety of measures to delay retirement have been taken, although the type of policy varies considerably across countries (Table 1).

Increases in the normal retirement age have been a key measure. The United States, Italy, Japan, Iceland and Hungary have all taken steps to raise the normal retirement age that will be phased in over the next twenty years. Equally, by increasing the number of contribution years required for a full pension, the French government has sought to discourage retirement at the earliest legal age (60). Early pensions based on long service are being phased out in Germany and Italy. Early pensions because of unemployment are being phased out in Germany, and the age of eligibility for such a pension is being raised in Finland.

A number of countries have moved towards more flexible retirement and stronger incentives to continue work (Table 2). The cost of retirement before the normal age of retirement has been increased in Finland by lowering the accrual rate for the age pension earned by people on pre-retirement benefits, and the incentive to retire later has been increased by raising the public pension accrual rates for those who work after 60. Italy and Sweden introduced notional-defined contribution systems during the 1990s that permit early retirement but apply a form of actuarial reduction to the benefits received. Later retirement is encouraged by benefit appreciation in the German and Swedish system and by a tax-free bonus in the Australian system to those who work beyond 65.

Given the variety of pathways to enter retirement, most countries have also acted to limit access to disability pensions for medically identifiable conditions and have taken steps to shift the costs of disability pensions back to employers. Some countries such as the United States and Germany have also introduced more frequent medical reviews of disability cases, complemented by greater incentives to return to work, increased emphasis on rehabilitation, or the end to the award of permanent benefits. While improving incentives to remain in the labour market is important, those who do so must also keep their jobs or be able to find new ones if they

**Table 1**

**Reforms to pension systems: Encouraging later retirement**

| Country | Measures to delay retirement [a] | | | | | | |
|---|---|---|---|---|---|---|---|
| | "Regular" retirement programmes | | | | | Access to other "early retirement" programmes | Other |
| | Increasing "normal" retirement age | Upward adjustment of women's retirement age | Lengthening contribution periods for full pension | Limiting access to early pensions | Improved actuarial characteristics | | |
| Australia | | + | | | + | + | |
| Canada | | | | | | | |
| Finland | +[b] | | | | + | + | + |
| France | | | + | | | | + / – |
| Germany | | + | | + | + | + | – |
| Hungary | + | + | + | | | + | |
| Iceland | +[b] | | | | | | |
| Italy | + | +[c] | | + | + | | |
| Japan | + | | | | | | |
| Korea | + | | | | | | |
| Netherlands | | | | | + | + / – | + / – |
| Norway | | | | | + | – | |
| Spain | | | | | – | – | |
| Sweden | + | | + | | + | | |
| Switzerland | | + | | | | | |
| United Kingdom | | + | | | | + | + |
| United States | + | | | | + | | |

[a] A "+" indicates a measure which should induce a rise in the effective age of retirement in the case of policies affecting the age of retirement, a fall in average benefits in the case of policies affecting average benefits, and an increase in the employment of older workers form measures affecting employment. A negative sign indicates the opposite. Based on Table 2. – [b] Civil servants only. – [c] New labour-market entrants only.

Source: Casey, B. et al. (2003), p. 43.

are laid off. In this context, cross-country evidence is encouraging. Countries vary widely in the participation rates of older workers but equally widely in employment rates, suggesting that there are no inherent barriers to the employment of older workers. Policies that improve the overall functioning and flexibility of the labour market may be particularly important for older workers, who may be more vulnerable to dismissal and less attractive to hire. In this latter respect, employment protection legislation that constrains employers to retain work once hired is likely to have a negative impact on labour demand.

Flexibility in adjusting wages to productivity may well be important to maintain the demand for

**Table 2**

**Reforms to pension systems since the early 1990s**

| Country | Measures to remove incentives to early retirement/increase incentives to later retirement[a)] |
|---|---|
| Australia | Tax-free bonus for those working after pension age; phased lifting of retirement age for women to 65 from 1997 to 2013; phased increase in the age at which the Superannuation Fund can be drawn to 60 over period to 2025. |
| Canada | Flexible retirement age to 70 introduced (1987); reduction of some disability-type benefits. |
| Finland | Reforms in 1990s: employee contributions introduced; public sector workers retirement date increased by two years with reduced accrual rate and long phase in period; Raised accrual rate for persons age 60-64; raised age of eligibility for certain early pensions by two years; lowered accrual rights to old age pensions for those in early retirement programmes; unemployment benefit for older workers reduced from five to three years. Reforms in 2003: Flexible retirement between 62 and 68 with actuarial adjusted benefit and accrual to pension rights rising with age; ceiling on pension abolished; pension based on earnings over entire work career; system will adjust to increased life expectancy; indexing of rights and of benefits gives heavier weight to prices. |
| France | Extension of contribution period for access to full pension (1994) from $37^1/_2$ years to 40 years; increased costs to employers of making older employees redundant. |
| Germany | Raised lower age limit and minimum number of contribution years for early retirement; accelerated phased abolition of early pensions for unemployment and long service; introduction of benefit reductions and measures for early and late retirement; upward equalisation of retirement age for women from 2000–2004 (1992). Ability of unemployed employees to claim old age pensions modified to reduce pension benefits. Early retirement at 62 allowed from 2012 with 35 years contribution. |
| Hungary | Raised official retirement age to 62 from 60m/55w to be achieved between 1997 and 2001 for men and 2009 for women; abolished special programme allowing early retirement for labour market reasons. |
| Iceland | Government employees no longer able to claim pension from age 60 (1997); accrual rate for retirement delayed beyond 65 increased (1998). |
| Italy | Progressive move into a notional defined contribution scheme whereby benefits are related to longevity and to contributions; abolition of "seniority pension" by 2008; increase in the number of contribution years for early retirement to 40 years by 2008; lifting of normal retirement age by five years (to 65m/60w); equalisation of retirement age for men and women for new entrants. |
| Japan | Flat rate portion of Old Age Employees Pension raised from 60 to 65 phased in over period 2001-2013 (1994); proposed increase in the earnings related component to 65 over the period 2013 to 2025. |
| Korea | Increase in the age at which flat-rate benefits are received from 60 to 65 (phase in period ending in 2013). |
| Netherlands | Increased costs placed on employers responsible for disability retirement; removal of tax privileges from voluntary early retirement schemes; changed tax rules governing occupational pensions to increase amount accrued if more years worked; transformation of VUT early retirement schemes into flexible retirement arrangements with the cost of early retirement shifted onto the individual rather than the collectivity. |
| Norway | Introduced an early retirement scheme (AFP) and reduced the eligibility age from 66 to 82 (1998). Access to this scheme was recently tightened up. Reduced the deduction from pensions payable due to income from work (1997); reduced rate of pension entitlements for each year of work. |
| Spain | Opened early retirement to all people who have been unemployed for at least six months from age 61; reduced the actuarial reduction for early retirement from eight to six per cent. |
| Sweden | Progressive move into a notional defined contribution scheme whereby benefits are related to longevity and directly to contributions to make the system more neutral with respect to the retirement decision; upper age limit for actuarial adjustment for a deferred pension abolished (1999). New legislation in the labour market area allows employees to remain in the labour force until 67. |
| Switzerland | |
| United Kingdom | Tightened access to disability pension; upwards equalisation of retirement age for women. |
| United States | Increase in the age for receiving a full pension to 67 (legislated 1983, phase-in period until 2027); increase in the appreciation of benefits when taken after "normal" retirement age. |

[a)] Covers both "regular" and special retirement programmes.

Source: Casey, B. et al. (2003), p. 44.

older workers, even though declining wages will reduce the supply of older workers. There can be a link here with pension arrangements for early retirement as overly generous replacement rates may generate strong disincentives to downwards adjustment of wages. Wage subsidies for employers who hire older unemployed people have been introduced in France and Korea and extended in Germany to improve the employment opportunities for older workers. In Japan a new wage subsidy was introduced, payable to older people who accept lower paid work when they have reached the mandatory retirement age of firms (usually 60). In Korea, firms are encouraged to hire older workers (55+) and receive a subsidy if they have more than six percent of their staff over this age.

As individuals move towards retirement, investment in marketable skills through training declines as the period over which this investment can be amortised becomes progressively shorter. Therefore if policy reforms manage to raise retirement ages this is in itself likely to raise the incidence of training among older workers. Most reforms in this area have not put in place specific programmes for older workers, but rather they attempt to ensure that older workers are not excluded from such programmes. Going beyond that, the United Kingdom has introduced new training policies specifically targeted at older cohorts. The Netherlands introduced tax incentives for the training of workers over 40, and Finland has established specific research agendas aimed at providing a better understanding of the situation and needs of older workers.

Greater flexibility in working hours will be important for retaining in the labour force those older workers who are willing to work part time as an alternative to full early retirement. In Finland, the age of access to individual early retirement benefits was lifted whilst the age of eligibility for its part-time pension was lowered. In 1992, Germany enabled individuals to take 1/3 to 2/3 of a regular old-age pension and to continue working part time. In 1997, workers over the age of 55 were granted access to another part-time early-retirement arrangement. In contrast, a similar, long-standing and widely used part-time pension scheme was dropped in Sweden, since it was seen as encouraging early withdrawal from work.

W. O. and J. S.

**Reference**

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# Inheritance Taxes

Inheritance Taxes play only a minor role in the total tax revenues of countries. Within the industrialised OECD countries the US reaches with 1.25 percent one of the highest shares of inheritance taxes in total tax revenues. In Austria, by contrast, the share is less than 0.2 percent and is one of the lowest. Also in Germany is the share with about 0,7 percent quite modest (figures of 2003).

The motivation for taxing bequests is mainly driven by considerations of fairness. Specifically, inheritance taxes are introduced and maintained to counter a tendency of concentration of property in a small number of very wealthy families or "dynasties". Besides their distributional effects, inheritance taxes also exert income and substitution effects. The substitution effect of an inheritance tax makes it "more expensive" – in terms of foregone present consumption – for a bequeather to shift one Euro of consumption possibilities to his heirs. This would tendentially increase present consumption (decrease savings). On the other hand, by the income effect of the inheritance tax the bequeather is made "poorer" and would, thus, tendentially reduce his present consumption (increase savings). The net effect is, of course, an empirical question.

The general relevance of an inheritance tax for economic behaviour and long-term economic growth can be roughly assessed when one knows the intentions for the savings of an individual, i.e. whether savings are mainly intended to serve as a security reserve for one's own old age or for making bequests. In other words, whether and how far bequests are made intentionally or unintentionally. In a still influential research Kotlikoff and Summers (1981) came to the conclusion that up to two thirds of capital accumulation might be motivated by making bequests. If this were so, a growth-conscious government should be careful to levy too high inheritance tax rates.

A comparison of the different national systems of inheritance taxation would be easy if the differences were only in the tax rates applied. But the systems are characterised by many aspects in which they differ widely. One is the general concept of the inheritance tax, namely whether the bequest and the following taxation is defined on the side of the bequeather (as e.g. in the UK and the US) or on that of the heir (as in most other countries). Denmark has a mixed system in this respect. Within the first system the personal relationship between bequeather and heir is irrelevant for the tax rate to be applied.

Another question is how far bequests from or to foreigners are taxed. One might think that bequests *to* foreigners are not taxed in those countries who conceptually define the tax liability on the side of the heir. But this is not the case. In many countries (e.g. Germany, France, Austria) for a tax liability to exist it is enough that either the bequeather or the heir is a citizen of the country concerned. This regulation is mainly meant to limit tax evasion.

Of importance is also the definition of the tax basis and its valuation as well as allowances and exemptions. The valuation is straightforward only in the cases of cash, deposits and tradable stock shares. Here the bequest is generally valued at its nominal amount or market value at the moment of the bequest. The valuation is more difficult, however, when houses or non tradable shares of enterprises are bequested. In many countries special schemes of valuation are used which often underestimate the factual value of the bequested assets.

The inheritance tax systems generally try to avoid negative effects on the continuation of enterprises by introducing special allowances, exemptions, or possibilities to defer tax payments.

In order to avoid incentives for tax evasion inheritance taxes must be integrated with gift taxes. In most countries tax-free donations to near relatives might be made once in a certain period (often, as in Germany, once in 10 years) and up to a certain limit. There is also some, although less systemic, need to integrate inheritance taxes with property taxes. Only a minority of OECD countries still has property taxes. Instead, most countries have inheritance taxes. Only very few countries, e.g. Canada and Estonia, have neither inheritance nor property taxes.

Table 1 informs about the general characteristics of the inheritance tax systems of nearly all EU and of some important non-EU countries. The information has been recently compiled by CESifo from national sources. Some important information has also been taken from a recent research report of

**Table 1**

**Inheritance Taxation, General Characteristics, 2004**

| | Inheri-tance tax | Tax rate range by class | Description | Threshold for exemption |
|---|---|---|---|---|
| Austria (1) | Yes | Class 1: 2 – 15%<br>Class 2: 4 – 25%<br>Class 3: 6 – 40%<br>Class 4: 8 – 50%<br>Class 5: 14 – 60% | Class 1: spouse, children<br>Class 2: grandchildren<br>Class 3: parents, siblings<br>Class 4: nephews<br>Class 5: others | Class 1+2: € 2,000<br>Class 3+4: € 440<br>Class 5: € 110 |
| Belgium (2) | Yes | Class 1: 3 – 30%<br>Class 2: 20 – 65%<br>Class 3: 25 – 70%<br>Class 4: 30 – 90%<br>Different number of brackets by region. | Different tax rates in three regions:<br>Flemish region, Walloon region, Brussels;<br>Categories of beneficiaries:<br>Class 1: spouse, children;<br>Class 2: siblings;<br>Class 3: nephews, uncles, aunts;<br>Class 4: others.<br>In the Flemish region: 3+4 combined. | Different rules apply for every category and for every region depending on the amount transferred. |
| Cyprus (8) | Yes | 10 – 30% | There is an initial exemption granted to heirs in the immediate family such as children, a life partner and others. The amount of the exemption is between CYP 50,000 and 150,000. An asset with a value of less than CYP 20,000 is exempt from tax. | n.a. |
| Czech Republic | Yes | n.a. | Close relatives (children/ spouse) are exempt from inheritance tax. | n.a. |
| Denmark | Yes | n.a. | n.a. | n.a. |
| Estonia | No | – | – | – |
| Finland (3) | Yes | 10 – 16%<br>Over 3 brackets | Three categories of beneficiaries:<br>Category 1: spouse, children and their direct heirs, parents;<br>Category 2: siblings;<br>Category 3: others. | Category 1 (spouse, children and their direct heirs, and parents): € 2,200. |
| France (4) | Yes | Descendants: 5 – 40%<br>spouse: 5 – 45%<br>others: up to 60%<br>Over 7 brackets | n.a. | Spouse: € 7,000<br>descendants: € 46,000<br>siblings: € 15,000 |
| Germany (5) | Yes | Class 1: 7 – 30%<br>Class 2: 12 – 40%<br>Class 3: 17 – 50% | Three categories of beneficiaries:<br>Class 1: (spouse, children and their direct heirs, and parents);<br>Class 2: (siblings, divorced spouse, nephews);<br>Class 3: Rest. | Class 1:<br>€ 307,000 (spouse)<br>€ 205,000 (children)<br>€ 51,000 (rest)<br>Class 2: € 10,300<br>Class 3: € 5,200 (rest) |
| Hungary (8) | Yes | 2.5 – 25% | Subject to certain conditions, including the degree of relationship with the deceased, part of an inheritance is exempt from tax or is taxable at a lower rate. | n.a. |
| Ireland (6) | Yes | n.a. | n.a. | € 441,198 if the beneficiary is a direct descendant or parents,<br>€ 44,120 if the beneficiary is a sibling or nephew,<br>€ 22,060 for the rest. |

**continued Table 1**

| | Inheri-tance tax | Tax rate range by class | Description | Threshold for exemption |
|---|---|---|---|---|
| Italy | No, abolished 18 October 2001 | – | – | – |
| Lithuania | Yes | n.a. | There is an exemption for inheritances received by a spouse, children, grandchil-dren, siblings. | LTL 10,000. |
| Luxembourg | No | – | – | – |
| Netherlands (7) | Yes | Spouses, children and unmarried couples living together: 5 – 27%<br>parents, brothers and sisters: 26 – 53%<br>non-relatives: 41 – 68% | Substantial amounts are not taxable. | n.a. |
| Poland | Yes | 7 – 20% | n.a. | There is a basic sum that is exempt from tax, depending on the type of asset. There is an exemption for a group of assets such as antique art, farms and more, subject to certain condi-tions. |
| Portugal (8) | Yes | 3 – 50% | n.a. | n.a. |
| Slovakia | Yes | n.a. | Three degrees of relationships with heirs. | n.a. |
| Slovenia | Yes | Class 2: 5 – 14%<br>Class 3: 8 – 17%<br>Class 4: 11 – 30% | Class 1: all direct descendants and spouses;<br>Class 2: parents, siblings and their descendants;<br>Class 3: grandparents;<br>Class 4: others. | No tax for Class 1 bene-ficiaries. |
| Spain | Yes | n.a. | n.a. | n.a. |
| Sweden | Yes | n.a. | n.a. | n.a. |
| United King-dom | Yes | n.a. | Tax rate is not based on the relationship between parties. | Taxable threshold from 6 April 2004: GBP 263,000. |
| Norway (10) | Yes | n.a. | The tax rates are decided annually by the Storting (Nor-wegian Parliament). | n.a. |
| Switzerland (11) | Yes | n.a. | n.a. | n.a. |
| Australia | No | – | – | – |
| Canada | No | – | – | – |
| Japan (12) | Yes | 10 – 70%<br>Over 9 brackets | n.a. | n.a. |
| New Zealand | No | – | – | – |
| United States | Yes | 18 – 55%<br>Over 17 brackets | Tax rate is not based on the relationship between parties. | n.a. |
| Note: In general: The amount of taxes in every country knowing an inheritance tax, depends on the amount inher-ited and the relationship between inheritor and descendant. This relationship is mainly characterized by “classes”. | | | | |

Source: (1) www.help.gv.at; – (2) AXA Insurance (Belgium); – (3) Finish Tax Administration; – (4) Service Publique (France); – (5) Bundesfinanzministerium; – (6) The Irish Revenue Commissioners; – (7) Ministerie van Financiën; – (8) World Tax Inc.; – (9) Inland Revenue Service; – (10) Skatteetaten; – (11) Kantonales Steueramt Zürich; – (12) Ministry of Finance (Japan).

Date of research in sources: July 2004.

**Table 2**

**Inheritance Taxation, Tax Rates, for Bequests to Spouses and Children, in Percent, 2004**

| | 100,000 € | | 250,000 € | | 500,000 € | | 1,000,000 € | | 5,000,000 € | | 30,000,000 € | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MTR | ATR | MTR | ATR | MTR | ATR | MTR | ATR | MTR | ATR | MTR | ATR | |
| Austria (1) | 6.00 | 4.21 | 9.00 | 6.39 | 10.00 | 7.96 | 11.00 | 9.25 | 15.00 | 12.68 | 15.00 | 14.61 | (a) |
| Belgium (2) | 8.00 | 6.50 | 18.00 | 16.10 | 24.00 | 17.15 | 30.00 | 23.58 | 30.00 | 28.73 | 29.79 | 30.00 | (b) |
| Denmark (3) | 15.00 | 15.00 | 15.00 | 15.00 | 15.00 | 15.00 | 15.00 | 15.00 | 15.00 | 15.00 | 15.00 | 15.00 | |
| Finland (4) | 16.00 | 13.74 | 16.00 | 15.10 | 16.00 | 15.55 | 16.00 | 15.77 | 16.00 | 15.95 | 16.00 | 15.99 | (c) |
| France (5) | 20.00 | 18.30 | 20.00 | 19.32 | 20.00 | 19.66 | 35.00 | 25.38 | 40.00 | 36.38 | 40.00 | 39.40 | |
| Germany (6) | 11.00 | 8.92 | 11.00 | 10.17 | 15.00 | 12.54 | 19.00 | 15.72 | 19.00 | 18.34 | 30.00 | 24.95 | (d) |
| Ireland (7) | 20.00 | 20.00 | 20.00 | 20.00 | 20.00 | 20.00 | 20.00 | 20.00 | 20.00 | 20.00 | 20.00 | 20.00 | (e) |
| Italy | No inheritance tax | | | | | | | | | | | | |
| Luxembourg | No inheritance tax | | | | | | | | | | | | |
| Netherlands (3, 8) | n.a. | n.a. | n.a. | 14.44 | n.a. | 18.07 | 27.00 | 21.22 | 27.00 | 25.84 | 27.00 | 26.81 | |
| Spain (3) | n.a. | n.a. | n.a. | 17.09 | n.a. | 22.15 | n.a. | 26.81 | n.a. | 32.56 | n.a. | 33.76 | |
| Sweden (3) | n.a. | n.a. | n.a. | 26.60 | n.a. | 28.30 | n.a. | 29.15 | n.a. | 29.83 | n.a. | 29.97 | |
| United Kingdom (9) | 40.00 | 40.00 | 40.00 | 40.00 | 40.00 | 40.00 | 40.00 | 40.00 | 40.00 | 40.00 | 40.00 | 40.00 | |
| Norway (10) | 20.00 | n.a. | 20.00 | n.a. | 20.00 | n.a. | 20.00 | n.a. | 20.00 | n.a. | 20.00 | n.a. | |
| Switzerland (11) | 2.80 | 2.80 | 3.80 | 3.80 | 4.68 | 4.68 | 5.50 | 5.50 | 6.00 | 6.00 | 6.00 | 6.00 | |
| Australia | No inheritance tax | | | | | | | | | | | | |
| Canada | No inheritance tax | | | | | | | | | | | | |
| Japan (3) | 40.00 | 27.30 | 50.00 | 43.00 | 50.00 | 35.95 | 50.00 | 46.50 | 50.00 | 49.29 | 50.00 | 49.88 | |
| New Zealand | No inheritance tax | | | | | | | | | | | | |
| United States (3) | n.a. | n.a. | n.a. | 29.52 | n.a. | 32.40 | n.a. | 35.97 | n.a. | 45.86 | n.a. | 48.48 | |

Notes: MTR: Marginal tax rate; ATR: Average tax rate for a bequest of the amount mentioned in the head line.

(a) Tax rates only valid for domestic beneficiary (descendants). – (b) Tax rates only valid for Brussels (Class 1 beneficiaries). – (c) Rates for First Category (spouse, children, parents). – (d) Tax rates only valid for domestic Class 1 beneficiaries. – (e) The threshold is valid until December 31, 2000, afterwards, it is indexed to inflation.

Source: (1) www.help.gv.at; – (2) AXA Insurance (Belgium); – (3) Zentrum für Europäische Wirtschaftsforschung (ZEW), Inheritance Taxation, Feb. 2004; – (4) Finish Tax Administration; – (5) Service Publique (France); – (6) Bundesfinanzministerium; – (7) The Irish Revenue Commissioners; – (8) Ministerie van Financiën; – (9) Inland Revenue Service; – (10) Skatteetaten. – (11) Kantonales Steueramt Zürich. Own calculations.

Zentrum für Europäische Wirtschaftsforschung (ZEW, 2004).

From the countries covered, an inheritance taxation does *not* exist only in Estonia, Italy, Luxembourg, Australia and Canada. Most countries differentiate the tax rates according to the degree of relationship which is often categorised in "classes". A "class 1" relationship is mostly that between a bequeather and his spouse or children, while higher numbers of classes are for relationships of lower degree. In most cases, the tax rates increase with higher class number and with higher amounts bequested. As mentioned above, it is mainly the UK and the US where the class of relationship does not play a role. Thus, for most countries, a full description of an inheritance tax rate system must take the format of a matrix with, e.g., the head row for the amounts bequested and the head column for the degree of relationship.

In several countries the lowest tax rates (for small amounts bequested and high degrees of relationship) lie between 2 percent and 5 percent only, as in Austria, Belgium, France, Hungary, Netherlands, Portugal, Slovenia. Somewhat higher "entry" tax rates – between 7 percent and 10 percent – can be observed in Finland, Germany, Poland and Japan. Much higher is this lowest tax rate, with 18%, only in the US (indifferent to classes of relationships). On the other hand, the highest tax rates for high amounts of bequests and low degrees of relationship are realised in Austria, Belgium, the Netherlands and Japan (between 60 percent and 90%). In the US, this rate is, with 55%, not under the highest rates, but is still relatively high.

Table 2 tries to assess the average and the marginal tax rates for different specific amounts of bequests. It refers only to "class 1" relationships, i.e. to that of bequeather and spouse or children. Some countries employ a non-progressive system of inheritance taxation (Denmark, Finland, Ireland, UK, Norway). In the other countries the system is of a more or less progressive nature.

For a bequest of € 100,000 the average tax rate ranges from a mere 2.8 percent (Switzerland) to 40 percent (UK). Austria, Belgium, and Germany also have tax rates under 10%. For a rather large bequest of € 30,000,000 it is again Switzerland which employs a low tax rate (6%). The rates in the other countries are decidedly higher. Switzerland is followed by Austria (14.6%), Denmark and Finland (15 percent and 15.9%). Tax rates of around 40 percent or even nearly 50 percent are found in France, UK, Japan and the US.

R. O.

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# Thresholds for Paying Income Tax

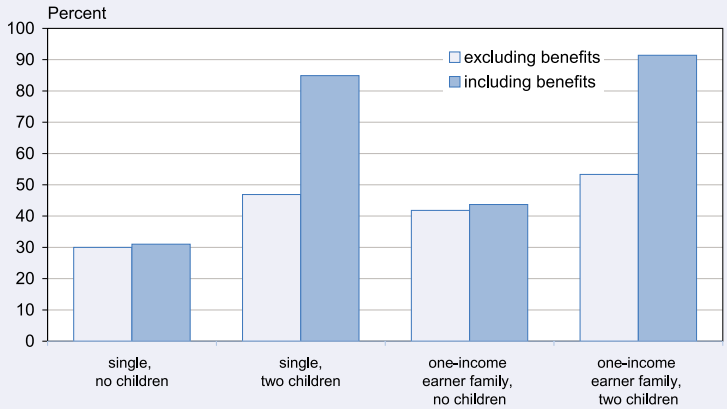
The minimum level of earnings at which personal income tax must be paid – the income tax threshold – is an important tax policy issue for several reasons. First, it is one of the determinants of the degree of progressivity in an income tax system. Secondly, the threshold where income tax starts being paid may influence the point at which "poverty traps" may become operative, with reference to effective tax rates that take into account both income tax and the means-testing of tax credits and benefits. Thirdly, the tax threshold will impact on the revenue yield from the personal income tax – increasing the threshold is generally costly in terms of revenue forgone. Fourthly, a significant increase in the tax threshold may be used to simplify tax administration by moving a substantial proportion of the population out of the income tax system. On the one hand, this option could greatly reduce aggregate compliance costs of the household sector. On the other hand, as more low-income households find themselves outside the income tax system, it will prove more difficult, for example, to use the income tax as a vehicle for delivering benefits to the needy.

The Table reports income thresholds for income tax (combined central and state/local) and income tax minus benefits as a percentage of earnings of an average production worker (APW) for family types for 2003. The reason for comparing income thresholds across countries both including and excluding benefits is that an increasing number of countries provide benefits through the tax system (by non-wasteable tax credits), whereas other countries still mainly provide benefits by the use of cash grants. Such differences in policies are reflected in the table, where the income threshold is almost unaltered by the introduction of benefits in some countries whereas the difference is large in other countries.

For a single individual without children, the threshold levels in 2003 were 30 percent of APW earnings on average among the OECD member countries excluding and 31 percent including benefits, ranging from 0.0 percent in France and Italy to 99.9 percent in Greece. For a sole parent, the average threshold levels in 2003 were 46.9 percent of APW earnings excluding and 84.9 percent including benefits. The thresholds excluding benefits range from 0.0 percent in France and Italy to 108.9 percent in Greece. Including benefits, the thresholds range from 39 percent in Germany to 155 percent in Luxembourg. For a one-income earner family without children, the average threshold levels in 2003 were 41.8 percent of APW earnings excluding and 43.7 percent including benefits. The thresholds range from 0.0 percent in France and Italy to 90.8 percent in Greece. For a one-income earner family with two children, the average threshold levels in 2003 were 53.5 percent of APW earnings excluding and 91.4 percent including benefits. The thresholds range from 0.0 percent in France and Italy to 131.6 percent in Luxembourg excluding benefits. Including benefits, the thresholds vary from 45.9 percent in Denmark to 211.2 percent in Luxembourg.

From these comparisons, it becomes apparent that income thresholds are higher for families with children, be it sole parents or one-income earner families, than for families without children in most countries (see Figure). The differences tend to be higher when benefits are included, although the tax system itself favours families with children in several countries in the sense that the income threshold is higher. The income threshold element of tax systems also seems to favour families over single individuals/parents. If one compares singles without children with one-income earner families with-

Income Thresholds for Income Tax in the OECD[a)] as a Percentage of APW, 2003




a) Unweighted average of 30 countries (see table) plus Iceland, Korea, Mexico and Turkey.

Source: Casey, B. et al. (2003).

**Income thresholds[a] including and excluding benefits as a percentage of APW[b], 2003**

| Country | Single, no children | Single, two children | One-income earner family, no children | One-income earner family, two children |
|---|---|---|---|---|
| Australia | | | | |
| income tax | 2.7 | 15.1 | 32.4 | 2.7 |
| income tax less benefits | 28.5 | 71.1 | 32.4 | 71.1 |
| Austria | | | | |
| income tax | 54.0 | 63.5 | 63.5 | 63.5 |
| income tax less benefits | 54.0 | 137.2 | 63.5 | 137.2 |
| Belgium | | | | |
| income tax | 29.5 | 40.5 | 39.5 | 53.6 |
| income tax less benefits | 29.5 | 68.0 | 39.5 | 82.1 |
| Canada | | | | |
| income tax | 20.6 | 38.0 | 38.0 | 39.1 |
| income tax less benefits | 25.0 | 85.3 | 45.5 | 84.6 |
| Czech Republic | | | | |
| income tax | 19.7 | 44.0 | 30.9 | 55.3 |
| income tax less benefits | 19.7 | 101.5 | 30.9 | 119.4 |
| Denmark[c] | | | | |
| income tax | 12.7 | 12.7 | 25.0 | 25.0 |
| income tax less benefits | 12.7 | 62.9 | 25.0 | 45.9 |
| Finland | | | | |
| income tax | 7.5 | 7.5 | 7.5 | 7.5 |
| income tax less benefits | 7.5 | 62.1 | 7.5 | 53.5 |
| France[d] | | | | |
| income tax | 0.0 | 0.0 | 0.0 | 0.0 |
| income tax less benefits[e] | 0.0 | 81.4 | 0.0 | 82.7 |
| Germany | | | | |
| income tax | 31.2 | 39.0 | 58.4 | 58.4 |
| income tax less benefits | 31.2 | 39.0 | 58.4 | 58.4 |
| Greece | | | | |
| income tax | 99.9 | 108.9 | 90.8 | 99.9 |
| income tax less benefits | 99.9 | 108.9 | 90.8 | 99.9 |
| Hungary | | | | |
| income tax | 51.9 | 82.8 | 51.9 | 82.8 |
| income tax less benefits | 51.9 | 125.4 | 51.9 | 121.8 |
| Ireland | | | | |
| income tax | 43.1 | 71.3 | 71.3 | 85.6 |
| income tax less benefits | 43.1 | 121.1 | 71.3 | 137.6 |
| Italy | | | | |
| income tax | 0.0 | 0.0 | 0.0 | 0.0 |
| income tax less benefits | 0.0 | 79.8 | 49.7 | 92.1 |
| Japan | | | | |
| income tax | 26.4 | 47.7 | 47.7 | 74.6 |
| income tax less benefits | 26.4 | 47.7 | 47.7 | 74.6 |
| Luxembourg | | | | |
| income tax | 42.1 | 106.3 | 76.9 | 131.6 |
| income tax less benefits | 42.1 | 155.0 | 76.9 | 211.2 |
| Netherlands | | | | |
| income tax | 16.7 | 46.8 | 37.3 | 46.8 |
| income tax less benefits | 16.7 | 93.2 | 37.3 | 92.8 |
| New Zealand | | | | |
| income tax | 11.7 | 11.7 | 11.7 | 11.7 |
| income tax less benefits | 11.7 | 60.9 | 11.7 | 60.9 |
| Norway | | | | |
| income tax | 20.6 | 30.9 | 30.9 | 30.9 |
| income tax less benefits | 20.6 | 76.1 | 30.9 | 62.5 |
| Poland | | | | |
| income tax | 32.4 | 32.4 | 53.7 | 53.7 |
| income tax less benefits | 32.4 | 73.4 | 53.7 | 94.7 |
| Portugal | | | | |
| income tax | 56.1 | 89.4 | 74.0 | 97.2 |
| income tax less benefits | 56.1 | 121.3 | 74.0 | 143.3 |
| Slovak Republic | | | | |
| income tax | 29.6 | 55.3 | 38.8 | 64.5 |
| income tax less benefits | 29.6 | 138.5 | 38.8 | 136.2 |
| Spain | | | | |
| income tax | 43.4 | 70.8 | 62.3 | 77.2 |
| income tax less benefits | 43.4 | 70.8 | 62.3 | 77.2 |
| Sweden | | | | |
| income tax | 7.7 | 7,7 | 7,7 | 7,7 |
| income tax less benefits | 7.7 | 48,7 | 7,7 | 48,7 |

**Continued Table**

| Country | Single, no children | Single, two children | One-income earner family, no children | One-income earner family, two children |
|---|---|---|---|---|
| Switzerland | | | | |
| income tax | 14.8 | 34.7 | 25.4 | 35.8 |
| income tax less benefits | 14.8 | 117.7 | 25.4 | 120.9 |
| United Kingdom | | | | |
| income tax | 44.1 | 85.3 | 56.6 | 85.3 |
| income tax less benefits | 44.1 | 97.6 | 56.6 | 97.0 |
| United States | | | | |
| income tax | 19.2 | 87.7 | 22.4 | 96.2 |
| income tax less benefits | 19.2 | 87.7 | 22.4 | 96.2 |
| OECD-unweighted average[f] | | | | |
| income tax | 30.0 | 46.9 | 41.8 | 53.3 |
| income tax less benefits | 31.0 | 84.9 | 43.7 | 91.4 |

[a] Income thresholds are calculated, using the country calculation files used in producing *Taxing Wages*, by finding the first unit of earned income where there is payable income tax. – [b] Average production worker. – [c] The labour market contribution of 8% is not included in these calculations. – [d] Including CSG and CRDS. Excluding CSG and CRDS, the thresholds are 68.6%, 111.4%, 96.6% and 127.0% of APW respectively for the four family types excluding benefits. – [e] Including CSG and CRDS. Excluding CSG and CRDS, the respective thresholds are 68.6%, 175.0%, 96.6% and 200.8% of APW. – [f] The above mentioned countries plus Iceland, Korea, Mexico and Turkey.

Source: OECD, Taxing Wages 2002–2003, Paris 2004, pp. 42–44.

out children, the thresholds are higher for the latter group in 20 countries including and 19 countries excluding benefits. Comparing sole parents with two children and one-income earner families with two children, the thresholds are higher for families in about half of the member countries both including and excluding benefits, whereas the reverse is true in two countries excluding benefits (Australia and Greece) and nine countries including benefits (Canada, Denmark, Finland, Greece, Hungary, Netherlands, Norway, the Slovak Republic and the United Kingdom).

W. O.

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# Shadow Economy and Undeclared Work

Since several years the currency demand approach to measure the size of the shadow economy is dominating the academic debate on this topic and is also influential in the public discussion on facts, causes and remedies of shadow activities. The basic idea of the approach is that the shadow economy is predominantly characterised by cash transactions. The growth rate of non-bank cash holdings in an economy is then taken as an indicator for the development of the shadow sector. The approach, thus, demands relatively little informational input and permits to calculate the share of the shadow economy for many countries and long time series. A problem with this approach is that the size of the shadow sector in a start year must be known – or assumed. The famous regression equation proposed by Tanzi (1983) included even variables which are supposed to be in a causal relation to shadow activities, as e.g. the tax load. A survey on the shadow economy around the world, with own and up-to-date calculations based on the currency demand approach, has recently been published by Friedrich Schneider and Robert Klinglmair (March 2004).

Only two months later the European Commission came out with a 240 pages report on "Undeclared work in an enlarged Union" (authors: Piet Renooy et al., May 2004). The main difference to the work of Schneider and Klinglmair is with respect to both the size of the shadow sector and the method employed.

What concerns the size of the shadow economy the two studies differ quite substantially (see chart). The EU report comes to estimates in the range of 2 percent of GDP (Austria) and 26 percent (Bulgaria), while the figures of Schneider and Klinglmair are between 8 percent (again Austria) and 40 percent (Latvia). For each country the estimates of Schneider and Klingelmair are higher than those of the EU study. Relatively small differences occur for some new EU countries as Slovakia and Hungary and entry candidates as Bulgaria, while the differences are rather large for some old EU member countries as Netherlands, Sweden or Belgium. This leads also to different orders of ranking.

Unfortunately, the comparability of the two studies is limited. The EU report covers a much smaller number of countries (only those in the chart), while Schneider and Klinglmair calculate the shadow sector for about 120 countries. Moreover, the basic year in the EU report is neither identical for the countries covered nor always very recent. For Finland, e.g., the EU study reports figures for 1992. Fortunately, the time series presented by Schneider and Klinglmair permit to compare figures for the same year.

The different estimates for the size of the shadow economy are finally rooted in different methods applied. The currency demand approach proceeds indirectly, while the authors of the EU study try to use direct methods, viz. mainly observation, interviews and surveys. An important role in developing this type of a repeatable empirical methodology has been played by the Danish Rockwool Foundation which produced in depth studies on the shadow economy for five countries (Denmark, France, Germany, Sweden, UK; results in Pedersen 2003 and Brodersen 2003). Unfortunately, the use of direct methods is limited to the named countries. For other countries, specifically the new and candidate EU member countries, the size of the shadow economy has been estimated by the national statistical offices. They had to proceed, however, on similar ways which had been commonly agreed upon.

Neither the study of Schneider and Klinglmair nor that of the EU sheds new light on the question of

the causes of shadow activities. The former study presents a review of the literature and summarises the main factors as being the burden of taxation and social security contributions, the intensity of regulations and the rule of law. The latter study puts the causal focus on labour market rigidities, imperfections of the goods markets as well as on factors like trust to and strength of the bureaucracy. A high tax burden is also mentioned as a possible explaining factor. But the authors, contrary to Schneider and Klinglmair, are convinced that it is not possible to establish empirically for this factor a neat connection to the size of the shadow economy (see also Osterkamp 2000). An important part of the EU study is dedicated to the description and analysis of what is seen as "good practices" in several countries for containing and rolling back the shadow economy.

R.O.

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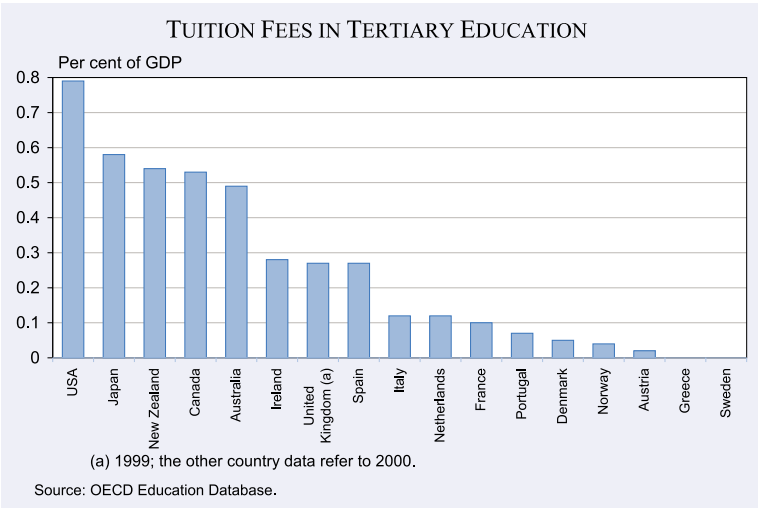
# Tuition Fees and Student Loans

**Figure 1**



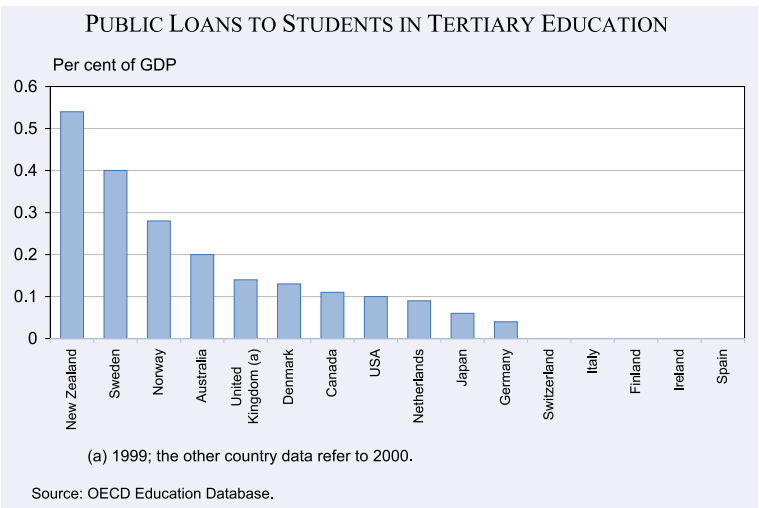

The funding of tertiary education institutions coming from tuition fees paid by students is highest in the United States, Japan, New Zealand, Canada and Australia and lowest in the Scandinavian countries, Austria and Greece (Figure 1). Tuition fees can vary across subjects and across universities for the same subject or degree. Most OECD countries charging tuition fees allow some variation.

In countries where the level of tuition fees varies across subjects, it is typically low in arts and high in medicine with science and law courses varying between these two extremes. This is arguably both fair and efficient, given the higher costs of such courses and that graduates from these courses typically earn higher incomes. In those countries where fees can vary across universities for the same subject or degree, very different outcomes can be observed. For example, in the United States fees vary substantially across universities, as notably private universities charge fees that are several times higher than the average of about USD 6,000. The level of tuition fees in the US public sector is typically decided by the university itself, but in many states there are regulations limiting the level of fees charged for students coming from within the state.

Many OECD countries operate some form of public student loans to finance tuition fees and/or living costs. However, for only a few countries – Australia, New Zealand, Norway and Sweden – student loans amount to 0.2 percent of GDP or more, with New Zealand having the highest level of student loans equivalent to more than 0.5 percent of GDP (Figure 2). Student loans are in some cases tied to the payment of tuition fees. Alternatively, loan schemes help students finance the tuition fees, but lending is not tied to tuition fees, and the same conditions apply whether a student borrows money to finance tuition fees or living costs. In some countries, the limited use of loans should be seen in the context of significant public grants.

A way of reducing the risk carried by individuals investing in their own education is to make student loan repayments conditional on graduate income. In Australia, New Zealand as well as in the United Kingdom, the speed of repayments depends on graduate income. Hardship procedures may to some extent replicate income contingency, and exist in most countries, such as the Netherlands, where persons with low income can request temporarily reduced repayments. Income contingent repayments, however, can be thought of as a less bureaucratic alternative to hardship procedures. Moreover, in the United States where the obligation to repay loans does

**Figure 2**



not depend on graduate income, the default rate is high, in particular for persons having studied at vocational institutions. In Sweden, repayments on loans to cover living costs used to be 4 percent of a graduate's income. Now, although repayments will be initially independent of income, graduates are entitled to have repayments reduced to equal no more than 5 percent of their income. This, however, does not reduce the period over which loans are to be repaid, and consequently the borrower will have to pay more in later years.

W. O.

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OECD, Economic Surveys, United Kingdom 2004, Paris 2004.

## Recent Entries to the DICE Database

In the third quarter of 2004 the DICE Database (www.cesifo.de/DICE) received about 60 new entries which partly consisted of actualisations of existing entries and partly of new topics. Some topics are mentioned below:

- Central Government Economic Administration
- Inheritance Taxation
- Property Taxation
- Labour Costs and Net Income
- Tax Burden by Family Type
- Financial Markets: Insider Trading Laws
- Obese Population
- Alcohol Consumption
- School Responsibility for Hiring Teachers
- State Religion

## Forthcoming Conferences

**Sustainability of Public Debt**
22–23 October 2004, in Munich

The purpose of this CESifo conference is to take stock of the theoretical and empirical knowledge on public debt and budget deficits. Particular emphasis will be placed on comparing public debt and budget deficits in different countries by means of selected case studies.

Scientific organisers: Robert Holzmann, Reinhard Neck and Jan-Egbert Sturm

**Pension Reform**
5–6 November 2004, in Munich
and first half of 2006, in Paris

The two conferences, jointly organised by CESifo and DELTA, will deal with the microeconomic incentives, macroeconomic implications, and political sustainability of intergenerational transfers, on the one hand, and the transitional costs and macroeconomic implications of funded systems of retirement savings, on the other.

Scientific organisers: Robert Fenge, Georges de Menil

**Global Economy**
10–11 December 2004, in Munich

The focus of the conference will be to explore how the gains from globalisation differ from the gains from trade, the effects of marginalisation and how it operates, new forms of global institutions and arrangements, and related topics.

Scientific organiser: John Whalley

**Stagnation, Fiscal Vulnerability and Public Policy**
22–25 August 2005, in Jeju, Korea

This is the 61st Congress of the International Institute of Public Finance (IIPF). Beside the main themes of the conference also various topics of public economics will be treated.

Scientific organiser: Jürgen von Hagen

## New Books

**A Constitution for the European Union**
Charles B. Blankart and Dennis C. Mueller (eds.)
CESifo Seminar Series, MIT Press
September 2004, ISBN 0-262-02566-3, 280 pp., $ 35

**Measuring the Tax Burden on Capital and Labor**
Peter Birch Sorensen (ed.)
CESifo Seminar Series, MIT Press
July 2004, ISBN 0-262-19503-8, 376 pp., $ 45

**The Economic Analysis of Civil Law**
Hans-Bernd Schäfer and Claus Ott
Edgar Elgar, 2004, ISBN 1-84376-277-3, 488 pp., $ 135
(Paperback edition announced for 2005)

**A Handbook of Comparative Social Policy**
Patricia Kennett (ed.)
Edgar Elgar, 2004, ISBN 1-84064-886-4, 448 pp., $ 144

**Designing Federalism – A Theory of Self-sustainable Federal Institutions**
Mikhail Filippov, Peter C. Ordeshook and Olga Shvetsova
Cambridge University Press, 2004, 0-521-81618-1, 348 pp.

**The International Climate Change Regime – A Guide to Rules, Institutions and Procedures**
Farhana Yamin and Joanna Depledge
Cambridge University Press, announced for December 2004, ISBN 0-521-84089-0

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# DICE

## Database for Institutional Comparisons in Europe

## www.cesifo.de/DICE

The database DICE was created to stimulate the political and academic discussion on institutional and economic policy reforms. For this purpose, DICE provides country-comparative information on institutions, regulations and the conduct of economic policy.

To date, the following main topics are covered: Labour Market, Public Finances, Social Policy, Pensions, Health, Business Environment, Capital Market and Education. Information about Basic Macro Indicators is added for the convenience of the user.

The information provided comes mainly in the form of tables – with countries as the first column –, but DICE contains also several graphs and short reports. Currently, the database consists of about 1 000 entries. In most tables all 25 EU and some important non-EU countries are covered.

DICE consists mainly of information which is – in principle – also available elsewhere. But we think that the access we provide is very convenient for the user, the presentation is systematic and the main focus is truly on institutions, regulations and economic policy conduct. However, many tables are based on empirical institutional research by Ifo and CESifo colleagues as well as the DICE staff.

DICE is a free access database.

Critical remarks and recommendations are always welcome.
Please address them to
osterkamp@ifo.de
or
ochel@ifo.de